

**DRAFT**

**FIRE MITIGATION ENVIRONMENTAL  
ASSESSMENT**

**FOR**

**FORT SILL, OKLAHOMA**

**Contract No. W912BV-10-D-2013  
Task Order 0003**

May 2016

*Prepared for:*

U.S. Army Corps of Engineers, Tulsa District  
and  
Fort Sill, Oklahoma

*Prepared by:*

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*On Behalf of:*

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## Signature Page

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## **PRIVACY ADVISORY**

*Public comments on this Draft Environmental Assessment (EA) are requested. Letters or other written or oral comments provided to the United States (U.S.) Army at Fort Sill Garrison, Oklahoma, may be published in the Final EA. As required by law, comments will be addressed in the Final EA and made available to the public. Any personal information provided to the U.S. Army, Fort Sill Garrison, will be used only to identify your intent to make a comment or to fulfill requests for copies of the Final EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of the Final EA. However, only the names of the individuals making comments and their specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the Final EA.*

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## List of Acronyms

%	percent
§	Section
§§	Sections
AAF	Army Airfield
ACHP	Advisory Council on Historic Preservation
ACS	American Community Survey
AIGIS	Army Installation Geospatial Information and Services
AIRFA	American Indian Religious Freedom Act
AOC	Area of Concern
APE	Area of Potential Effect
AQCR	Air Quality Control Region
AR	Army Regulation
ARTC	Air Route Traffic Control
ASSON	Aerial Spray Statement of Need
BA	Biological Assessment
BCVI	Black-Capped Vireo
BG	Block Group
BGEPA	Bald and Golden Eagle Protection Act of 1940, Public Law Number 95-616, 92 Statute 3114 (1978)
BMP	Best Management Practice
BO	Biological Opinion
CAA	Clean Air Act
C&D	Construction and Demolition
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1986, Public Law 99-499, 100 Statute 1613 (1986)
CFR	Code of Federal Regulations
CWA	"Clean Water Act", Federal Water Pollution Control Act of 1948, Public Law 845, Statute 1155 (1948)
DA	Department of Army
dB	decibel
dBA	A-weighted decibel
DNL	Day-Night Average Sound Level
DoD	Department of Defense
DODI	Department of Defense Instruction
DOPAA	Description of the Proposed Action and Alternatives
DPTMS	Directorate of Plans, Training, Mobilization, and Security
DPW	Directorate of Public Works
EA	Environmental Assessment
EJ	Environmental Justice
EJSCREEN	Environmental Justice Mapping and Screening Tool
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act of 1986

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EQD	Environmental Quality Division
ESA	Endangered Species Act of 1973, Public Law 93-205, 87 Statute 884 (1973)
FAA	Federal Aviation Administration
FBER	Firebreak within the East Range
FBWR	Firebreak within the West Range
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FNSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act of 1981, Public Law 97-98, 95 Statute 1341 (1981)
FR	Federal Register
ft	foot/feet
GIS	Geographic Information System
HM	hazardous material
HQDA	Headquarters, Department of Army
HW	hazardous waste
HMWMP	Hazardous Material and Waste Management Plan
IA	Impact Area
IAW	in accordance with
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
IPaC	Information, Planning, and Conservation
IPM	Integrated Pest Management
IPMC	Installation Pest Management Coordinator
IPMP	Integrated Pest Management Plan
ITAM	Integrated Training Area Management
JRA	Jones Ridge Area
KHM	Kerr Hill Machine Gun Range
LAW	Lawton-Fort Sill Regional Airport
LOS	Level of Service
m	meter
MBTA	Migratory Bird Treaty Act of 1918 as amended, Public Law 105-312, 112 Statute 2956 (1998)
MSW	Municipal Solid Waste
NAAQS	National Ambient Air Quality Standards
NAIP	National Aerial Imagery Program
NAGPRA	Native American Graves Protection and Repatriation Act
NCA	North Carlton Area
NDRA	Non-Dudded Range Area
NEPA	National Environmental Policy Act of 1969 as amended, Public Law No. 94-83, 89 Statute 424, 853 (1975)
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act of 1966
NIC	Night Infiltration Course

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NLCD	National Land Cover Database
No.	Number
NOA	Notice of Availability
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
NWR	National Wildlife Refuge
NWSRS	National Wild and Scenic Rivers System
OAC	Oklahoma Administrative Code
OAS	OA Systems Corporation
OCC	Oklahoma Conservation Commission
OCWP	Oklahoma Comprehensive Water Plan
ODEQ	Oklahoma Department of Environmental Quality
ODWC	Oklahoma Department of Wildlife Conservation
ONHI	Oklahoma Natural Heritage Inventory
OSHA	Occupational Safety and Health Act
OWRB	Oklahoma Water Resources Board
PDES	Pollutant Discharge Elimination System
PEA	Programmatic Environmental Assessment
PM <sub>10</sub>	Particulate Matter with a Diameter Less Than or Equal to a Nominal 10
PM <sub>2.5</sub>	Particulate Matter with a Diameter Less Than or Equal to a Nominal 2.5
PMO	Pest Management Office
PWS	Public Water Supply
RA	Restricted Area
RCG&A	R. Christopher Goodwin & Associates, Inc.
RCRA	Resource Conservation and Recovery Act of 1976
ROI	Region of Influence
ROW	Right-of-Way
SCA	South Carlton Area
SDWA	Safe Drinking Water Act
SHPO	State Historic Preservation Officer
SMA	Scorpion Mountain Area
SOP	Standard Operating Procedure
SPCCP	Spill Prevention Control and Countermeasures Plan
SUA	Special Use Airspace
SWPPP	Stormwater Pollution Prevention Plan
TA	Training Area
TDS	total dissolved solids
TE	Task Element
TG	Technical Guide
TMDL	Total Maximum Daily Load
UAS	Unmanned Aerial System
USACE	U.S. Army Corps of Engineers
USAEC	U.S. Army Environmental Center/Command
USAFCoE	U.S. Army Fires Center of Excellence

U.S.	United States
USC	U.S. Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UXO	unexploded ordnance
WHPA	Wellhead Protection Area
WOTUS	Waters of the U.S.
WVRA	Woody Vegetation Removal Area

## CHAPTER 1 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

### 1.1 Introduction

This Environmental Assessment (EA) analyzes and documents the potential environmental consequences of fire mitigation strategies proposed within the United States (U.S.) Army Garrison Fort Sill (Fort Sill or Installation), Oklahoma. Fort Sill is located in Comanche County in southwestern Oklahoma (Figure 1.1-1). The Installation consists of 93,679 acres with a Cantonment Area (military quarters) of 7,066 acres, 85,985 acres of ranges, and 590 acres of open space and other ancillary uses. Approximately 56 percent (%) of the ranges (48,152 acres) are used for training, and the remainder consists of Impact Areas (IAs) where use of ordnance and demolitions occur. IAs have limited uses due to the danger to personnel and equipment. Thirty-eight of the 45 ranges/courses/facilities are used year-round for live fire and training. The Installation extends approximately 27 miles in an east-west direction and approximately 4 to 9 miles in a north-south direction, depending on the location.

The Installation is located approximately 90 miles southwest of Oklahoma City and approximately 50 miles north of Wichita Falls, Texas. Interstate Highway (herein Interstate) 44 intersects the eastern portion of the Installation. The City of Elgin and the Town of Medicine Park are located on the Installation's northern border. The cities of Cache and Lawton, and the Town of Indianola are located on the southern border of the Installation. The Cantonment Area is located adjacent to the corporate limits of Lawton, Oklahoma. The Wichita Mountains National Wildlife Refuge (NWR) is located adjacent to the Installation's northwestern boundary.

In 1869, Fort Sill was established to protect and maintain order in the "Kiowa, Comanche, and Apache Reservation" (ALL Consulting, LLC 2014, 1-1). Since that time, it has served in all major American military actions domestically and internationally by providing training. The Installation is home to the U.S. Army Fires Center of Excellence (USAFCoE); the 75<sup>th</sup>, 428<sup>th</sup>, and 434<sup>th</sup> Field Artillery Brigades; the 30<sup>th</sup> and 31<sup>st</sup> Air Defense Artillery Brigades; and the Armed Forces Reserve Center. It is one of five locations for Army Basic Combat Training (Leidos Engineering LLC 2014, 1-1). The Installation's mission is to train soldiers and develop Field Artillery, electronic warfare, and Air Defense Artillery leaders; design and develop fire support for the force; support unit training and readiness; mobilize and deploy operating forces; and maintain the Installation's infrastructure and services (Leidos Engineering LLC 2014, 1-1).

The Installation has several ranges, including ground and aerial bombing (Leidos Engineering LLC 2014, 1-1). The U.S. Army, Air Force, Navy, and other commercial aircraft use the airspace around Fort Sill and the ranges for training. The East Range is located on the eastern portion of Fort Sill and is used primarily for small arms training (Figure 1.1-2). The West Range is located west of Interstate 44 and east of Highway 115 and is used mostly for artillery and live ammunition aircraft bombing. The Quanah Range is located west of Highway 115 on the extreme western edge of the Installation and surrounds the Falcon Air Force Reserve Bombing Range, used by fixed and rotary wing aircraft for laser targeting. This Range is used by the Army, Air Force, Marines, and Euro-North Atlantic Treaty Organization nations to train pilots and ground forces in the use of tactical aircraft. Fort Sill's training exercises can create risk of unexploded ordnance (UXO) on the ground; the types of UXO that may occur include explosives such as bombs, bullets, shells, and grenades, and these pose a threat of detonation.

## 1.2 Purpose and Need

The purpose of the Proposed Action is to provide increased fire protection for the Installation and nearby communities through fire mitigation by preventing and controlling fast-moving fires while minimizing possible injuries and deaths related to UXO. The Proposed Action's increased fire protection would support Fort Sill's mission to train the U.S. military for the defense of the nation and fulfillment of the military directives of the President and Secretary of Defense under the guidance of the U.S. Department of Defense (DoD).

Recent fires illustrate the need for this Proposed Action. Between March 2012 and July 2013, 148 documented fires due to natural conditions and/or training exercises occurred on the Installation (Directorate of Plans, Training, Mobilization, and Security [DPTMS] 2013, 8). Between 2009 and 2011, four fires began on the Installation and then proceeded into neighboring areas (DPTMS 2013, 11). Of these, two occurred along the border of the Installation and the Wichita Mountains NWR, one entered the Town of Medicine Park, and another occurred on the eastern edge of the Installation. The June 29, 2011 fire in Medicine Park required evacuation of approximately 1,500 residents and destroyed 13 homes (News 9 2011, 1-2). This fire originated on West Range IA and spread over 4,000 acres before it crossed Highway 49 and entered Medicine Park. Fire crews found it difficult to fight the fire due to the wind, extreme fire conditions, high temperatures, drought, low fuel moisture, and low relative humidity. Approximately 1,500 acres outside the Installation and within and adjacent to Medicine Park were burned. Bulldozers and water delivered by helicopter were used to control the fire. Figure 1.2-1 illustrates the approximate extent of the 2011 Medicine Park Fire within Fort Sill and Medicine Park per communication with Mr. Aaron Peterson, Army Installation Geospatial Information and Services (AIGIS) Program Manager at Fort Sill on April 7, 2015.

Conditions and activities within Fort Sill generate a very high or extreme wildfire probability (DPTMS 2013, 5, 8-9). Factors influencing the probability of wildfires include:

- Wind patterns and high-velocity winds;
- Sources of fire fuel (including grasses, cedar, and other woody fuel);
- "Human caused" risks, such as ranges, direct and indirect fire zones, use of incendiary and pyrotechnic devices, impact and training areas; and
- Other natural factors, such as lightning.

IAs are designated locations on the Installation where units may practice firing live and inert rounds. Dudded ordnance is an explosive munition which has not been armed as intended or has failed to explode once armed (U.S. Army Alaska 2005, 1-38). Dudded areas have a high potential for UXO and have limited access. Major weapons systems ranges are semi-permanent or permanent facilities used for major weapons systems and may utilize dud-producing munitions. Non-Dudded Range Areas (NDRAs) are buffer zones between the high UXO areas and areas without UXO. A NDRA has a lower probability of UXO. Small Arms Ranges are used for small arms weapons firing and typically do not utilize potential dud-producing munitions. The names and locations of IAs and NDRAs are provided (Figure 1.2-2).

The Installation has four main IAs: Quanah Range, West Range, North Arbuckle, and South Arbuckle. NDRAs and IAs include, but are not limited to, Quanah Range IA, West Range NDRA-Jones Ridge Area (JRA), West Range NDRA-North Carlton Area (NCA), West Range IA-NCA, West Range IA-JRA, West Range NDRA-South Carlton Area (SCA), West Range IA-SCA, West Range IA-Scorpion Mountain Area (SMA), West Range NDRA-SMA, North Arbuckle IA, and South Arbuckle IA. The Quanah Range is located furthest west, followed by the West Range. The North Arbuckle and South Arbuckle IAs are both located in the East Range.

Fort Sill actively mitigates fire risks by firebreaks, minimization of fuel loads including deadfall and highly-combustible vegetation (agricultural leases and grounds maintenance), and fuel load reduction (prescribed burns, fire wood/timber sales, and mesquite removals) (DPTMS 2013, 24). Prescribed burns are allowed throughout the Installation with the exception of the Cantonment area. Since 1982, Fort Sill has engaged in prescribed burns, and since 1984 has geospatially tracked wildlife to avoid adverse impacts to protected species during these burns and other activities (DPTMS 2013, 23).

Two plant species provide a high level of fire fuel and are actively managed by the Installation:

- Eastern red cedar (*Juniperus virginiana*) controlled with prescribed burns and mechanical methods; and
- Johnson grass (*Sorghum halepense*) managed through mowing (Directorate of Public Works [DPW] 2014, 13, 21-22).

Herbicides are used, in addition to mechanical removal, to control fire fuel and noxious weeds. Herbicide application typically occurs at ground level. The Installation has also conducted two approved aerial applications of herbicide over areas with dense honey mesquite cover in the past 2 years.

The current fire management techniques have not fully controlled wildfire risk, especially the risk of fast-moving wildfires. An analysis by the Installation's DPTMS concluded that the higher risks of wildfires occur in the central and eastern portions of the Installation. The analysis evaluated prevailing wind data and types of fire fuel, including trees, grasses, and leaf litter, using the best available information per communication with Mr. Peterson, AIGIS Program Manager at Fort Sill on April 7, 2015. The analysis identified the following Areas of Concern (AOC) based on the risk of fast-moving fires: North Arbuckle to Elgin; Brush Canyon to Medicine Park; Kerr Hill Machine Gun Range (KHM) area; and the Night Infiltration Course (NIC) area (DPTMS 2013, 10; Figure 1.2-2). The presence of UXO limits fire management responses in these and other areas. UXO poses an unacceptable risk to fire and emergency personnel during wildfires, and other workers during mechanical removal of fire fuel. In the spring of 2013, a firefighter was injured by exploding UXO per communication with Ms. Sarah Sminkey, National Environmental Policy Act of 1969 (NEPA) Coordinator for Fort Sill, November 12, 2014.

### 1.3 Scope and Content of the EA

This EA was developed in accordance with NEPA (40 Code of Federal Regulations [CFR] Sections [§§] 1500-1508) and implementing regulations issued by the President's Council on Environmental Quality (CEQ) *Regulations for Implementing the Procedural Provisions of NEPA* (43 Federal Register [FR] 55990) and the *Army Regulation Environmental Analysis of Army Actions*.<sup>1, 2</sup>

The purpose of the EA is to inform decision makers of the likely potential consequences of implementation of the Proposed Action and alternatives (Chapter 2). The EA identifies, documents, and evaluates the environmental effects of fire mitigation on the human and natural environment at Fort Sill. The alternatives and evaluation of environmental effects were summarized in compliance with the requirements of the U.S. Army Environmental Center (USAEC) guidance (USAEC 2004a, 1-1 to B-6; USAEC 2004b, 1-1 to D-11).

An interdisciplinary team of cultural resource specialists, biologists, engineers, planners, and scientists analyzed the Proposed Action and alternatives in light of existing conditions and identified relevant beneficial and adverse effects associated with the action. This EA is organized to reflect these required topics:

- Affected environment conditions as of 2015 or the most recent available data are considered to be the "baseline" conditions and are summarized by type of resource (Chapter 3);
- Environmental effects of the Proposed Action and alternatives summarized by type of resource as well as required permits and authorizations (Chapter 4);
- Public involvement efforts (Chapter 5);
- List of preparers (Chapter 6);
- References (Chapter 7);
- Figures (Chapter 8); and
- Tables (Chapter 9).

Each of the environmental impact categories identified in the USAEC's *Guide to Environmental Impact Analysis* is addressed in this EA. However, detailed discussions of the affected environment and environmental effects would only be provided where a significant impact may occur or uncertainties require evaluation. Supporting documents are incorporated primarily by reference, with the exception of agency letters and technical analysis that are included in the text, or in appendices. Chapter 4 also includes a discussion of cumulative impacts, and where appropriate, identifies best management practices (BMPs).

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<sup>1</sup> 32 CFR §§ 651, et seq.

<sup>2</sup> NEPA, 42 U.S. Code (USC) § 4321-4347 40; CFR §§ 1500-1508.

## 1.4 Decisions to Be Made

The EA will be used to evaluate environmental consequences or effects, select a preferred alternative, and determine if a Finding of No Significant Impact (FNSI) is appropriate. A Draft EA will be available for public comment for 30 days, and the Notice of Availability (NOA) for the Draft EA will be published in the local newspaper, the *Lawton Constitution*. If appropriate, the FNSI will document the decision to implement the preferred alternative, the environmental effects of the preferred alternative, and any regulatory requirements or required mitigation. If appropriate and approved, the FNSI will be signed no earlier than 30 days from the publication date of the NOA for the Final EA/Draft FNSI in the *Lawton Constitution*.

## 1.5 Public Involvement

Executive Order (EO) 12372, *Intergovernmental Review of Federal Programs*, requires intergovernmental notifications prior to making any detailed statement of environmental consequences.<sup>3</sup> Through the process of Interagency and Intergovernmental Coordination for Environmental Planning, the proponent must notify concerned federal, state, and local agencies and allow them sufficient time to evaluate potential environmental consequences of a proposed action. Comments from these agencies are subsequently incorporated into the environmental analysis.

The Installation is the proponent of this fire mitigation action and is the lead agency for the preparation of this EA.

The U.S. Army will encourage and invite public/agency, tribal, and other participation in the NEPA process. Consideration of the views of and information from all interested persons promotes open communication and enables better decision making. All agencies, organizations, and members of the public having a potential interest in the Proposed Action, including minority, low-income, disadvantaged, and Native American groups, are encouraged to participate in the decision-making process during the 30-day Draft EA public review period.

Public participation opportunities with respect to this EA and decision making on the Proposed Action are guided by 32 CFR § 651.<sup>4</sup> The Draft EA will be available to the public and other stakeholders, including regulatory agencies, for review at the Lawton Public Library located at 110 SW 4<sup>th</sup> St, Lawton, OK 73501 for a period of at least 30 days. The public involvement process is further described in Chapter 5.

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<sup>3</sup> EO 12372, 24 CFR § 570.612 (1982).

<sup>4</sup> 32 CFR §§ 651, et seq.

## CHAPTER 2 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES (DOPAA)

### 2.1 Proposed Action

Fort Sill proposes to implement fire mitigation measures to prevent and control fast-moving fires, in turn minimizing and preventing possible injuries or fatalities of firefighting personnel. For the purposes of this EA, the Proposed Action and alternatives are evaluated for the anticipated implementation period of 10 years.

### 2.2 Alternatives Considered

Fort Sill evaluated a combination of fire hazard mitigation techniques, including fire fuel minimization and removal; use of targeted and aerial spraying of herbicides to reduce fire fuel; and the use and location of firebreaks to identify the following alternatives for study.

#### 2.2.1 No Action Alternative

Fort Sill would continue implementing existing fire hazard mitigation, including the following:

- Control species providing significant fire fuel by prescribed burns and mechanical methods for the invasive Eastern red cedar; and mechanical removal combined with herbicide for honey mesquite and Johnson grass; where feasible (Fort Sill 2014, 13, 21-22) (Figure 2.2-1);
- Apply approved herbicides to control noxious weeds in compliance with federal and state laws and internal BMPs (DPW 2014, 8-88);
- Out-lease approximately 5,000 acres of agricultural lands for hay and crop production to reduce fire fuel (Fort Sill 2014, 2) (Figure 2.2-1);
- Continue to remove woody vegetation, including tree canopy, for 30 feet (ft) on either side of roadways and fence lines with the exception of old growth areas where deadfall and underbrush would be removed instead; and
- Maintain existing firebreaks, including a 30-ft buffer, in the same manner as road rights-of-way (ROW) and fence line are maintained (Figure 2.2-1).

Figure 2.2-1 illustrates areas that have been, or are under consideration, for prescribed burning that may be conducted at various intervals: annually, every 2 years, or as mitigation during wildfire events, per communication with Mr. Peterson, AIGIS Program Manager at Fort Sill on April 7, 2015. The out-lease agricultural areas include areas that may be leased for crop production (e.g., alfalfa fields).

Chemical treatments, such as herbicide applications with a pre-application approval process, could be utilized to control fire fuel although these treatments must be approved by the Fort Sill Environmental Quality Division (EQD) and Directorate of Public Works (DPW) Pest Management. Furthermore, disturbance of threatened and endangered species during nesting and other sensitive life-cycle periods is prohibited. Contractors must comply with air quality regulations and applicable codes and standards. Furthermore, the contractor must be licensed by

the State of Oklahoma or the Department of Army (DA) and provide a copy of their license to the Installation Pest Management Coordinator (IPMC) per communication with Ms. Sminkey, NEPA Coordinator for Fort Sill, March 17, 2015.

Two previous aerial spraying activities were conducted to control mesquite encroaching on training stands. The chemical used takes 3 years to move into the roots and kill the mesquite. Visual evidence of dead wood is present over the 3-year period. After the chemicals reach the roots, new growth will be controlled using controlled burns and spot treatment, as needed (OAS 2016, 2).

While the majority of herbicide applications would occur from the ground, the Installation could perform approved aerial applications over areas with dense honey mesquite cover (illustrated as Mesquite Savanna in Figure 2.2-1) per communication with Mr. Christopher Deurmyer, Wildlife and Fisheries Biologist for Fort Sill, March 10, 2015. When trees are mechanically removed during construction of a Woody Vegetation Removal Area (WVRA), the stumps will remain, and a combination of native grasses and other species will be used to restore the area (Fort Sill 2010, 1-66). Disturbed areas will be restored in accordance with DPW Standard Operating Procedures (SOPs).

### **2.2.2 Proposed Action**

The Proposed Action is the only action alternative that will be carried forward for detailed analysis in this EA. In addition to the programs identified in the No Action Alternative (including general removal of woody vegetation along roads and fence lines), the Proposed Action will include the following additional actions to be performed by Fort Sill or its selected contractors:

- Remove 340 acres of woody vegetation from 15 to 800 ft on either side of 34 miles of specific roadways, excluding old growth trees (Figures A-1 to A-22);
- Construct six 40-ft-wide interior firebreaks that would cover an area of approximately 30 acres by removing vegetation and plowing to remove all fire fuel (Figures A-23 to A-26); and
- Where mechanical removal or ground-level spraying is impracticable due to the presence of UXO or extensive undergrowth, programmatically evaluate and implement aerial spraying of sources of fire fuel (e.g., noxious weeds) to reduce the fuel load.

The Proposed Action includes constructing firebreaks within the West Range (FBWR – FBWR51, FBWR56, and FBWR58) and the firebreaks within the East Range (FBER – FBER56, FBER66, and FBER68). The new firebreak locations were selected to avoid sensitive features, such as wetlands, streams, and protected habitat, and will also connect to existing firebreaks. These connections will provide additional control of fast-moving fires based upon the wildfire probability analysis.

Where practical and environmental conditions permit, firebreaks would be constructed by clearing all vegetation in a 40-ft-wide corridor (20 ft on each side of the corridor centerline). If

Black-Capped Vireo (*Vireo atricapilla*, BCVI) habitat is identified by ecological surveys or perennial streams are present, the firebreak would be constrained to avoid impacts to BCVI or other protected habitat and minimize adverse effects on streams, including the potential for increased erosion and adverse effects on water quality associated with removal of riparian vegetation per communication with Ms. Sminkey, NEPA Coordinator for Fort Sill, November 12, 2014. Removal and thinning of vegetation would be accomplished manually in the immediate vicinity of cultural resources to avoid adverse, direct effects that may be caused by mechanical removal methods.

Firebreaks would be constructed and regularly maintained by contractors. During firebreak construction, all stumps and root systems will be plowed and vegetation removed. This work would be coordinated with the Fort Sill Fire Department and DPW in compliance with the Firebreak/Fuel Removal SOP and Maintenance SOP. Per email communication with Mr. Mark A. Hill, Installation Pest Management Coordinator for Fort Sill, December 1, 2014, contractors would inspect, maintain, and repair all firebreaks in accordance with IAW Task Element (TE) 5.7-002. This effort would maintain the drainage between April and November, or as instructed by the Contracting Officer or Contracting Officer's Representative.

The WVRAs were selected to reduce wildfires. and using similar criteria, to avoid sensitive features. More detailed maps of the WVRAs are provided in Appendix A. The WVRAs will be constructed and maintained using appropriate equipment. The majority of the proposed WVRAs will be located on the Installation; however, several areas extend beyond the Installation boundary. It is anticipated that approximately 459 acres of land would be disturbed during construction of firebreaks and WVRAs.

All firebreak construction and woody vegetation removal would be performed by qualified personnel and comply with applicable laws and Installation guidelines. The contractor would develop and implement a fuel removal plan that would include underbrush clearing and/or tree thinning, slash removal, vertical removal of tree branches, and removal of downed trees. This would be accomplished by a combination of mechanical and manual treatments.

Mechanical treatments, such as mulching, grinding, mowing, chopping, and removal of such materials, would meet appropriate practices in areas that do not require special treatment due to sensitive resources. Plowing will be utilized during firebreak construction and future maintenance activities.

Areas with high levels of fuel and cultural resources will be cleared manually as necessary to either remove fuel or avoid damage to cultural resources that would be adversely affected by prescribed burns, wildlands fire, or heavy machinery. Manual treatments include thinning of vegetation with chainsaws and hand tools.

The *Final Programmatic Environmental Assessment (PEA) for the Implementation of U.S. Army Integrated Pest Management Program* provides policy guidance for routine pest management activities; however, site-specific activities, such as aerial spraying, require additional documentation. To obtain approval of aerial spraying, requestors would prepare an Aerial Spray Statement of Need (ASSON) and submit it for review and consideration in compliance with

*Army Regulation (AR) 200-1 Environmental Protection and Enhancement* (USAEC 2010, 6-7). AR 200-1 allows aerial application of chemicals to control overgrowth in ranges where UXO prevent normal Integrated Pest Management (IPM) practices, but requires an ASSON within an installation's *Integrated Pest Management Plan* (IPMP) (USAEC 2010, 6-7; Department of the Army Headquarters [HQDA] 2007, 1-131).

In addition to honey mesquite control, proposed aerial spraying would target areas with high concentrations of Johnson grass and other noxious weed species, especially in areas with potential for fast moving wildfires (Figure 1.2 2) per communication with Mr. Deurmyer, Wildlife and Fisheries Biologist for Fort Sill, March 10, 2015. Each aerial herbicide application would be reviewed and approved by the Fort Sill EQD, the Fort Sill Pest Management Office (PMO), and the USAEC entomologist; the aerial herbicide application and authorization would be documented using DoD Form 1532 1. The DoD classifies herbicides as forms of pesticides; therefore, no off label uses of herbicides would be allowed, and the application would comply with federal, state, and local standards, including local standards for honey mesquite control.

### **2.3 Alternatives Eliminated from Further Consideration**

Alternatives for proposed firebreaks were initially selected to address the potential for fast-moving fires and evaluated to minimize the risk of wildfires or exacerbating conditions causing wildfires. Fort Sill eliminated some proposed firebreaks during the screening analysis to avoid disturbance of endangered species habitat, wetlands, and perennial streams; minimize safety risks; and prevent access restrictions, such as the City of Lawton's fenced wastewater treatment plant property.

Fort Sill also evaluated removal of deadfall in Training Area (TA) 39, but later determined that removal of deadfall and vegetation along Deer Creek Canyon Road and the nearby proposed firebreak would be more effective; therefore, removal of deadfall in TA 39 was removed from further consideration. The removal of vegetation along Deer Creek Canyon Road would be accomplished under a separate Installation program, and is further described in Section 4.4 Cumulative Effects.

## CHAPTER 3 AFFECTED ENVIRONMENT

### 3.1 Introduction

CEQ regulations<sup>5</sup> require a description of the environmental setting for each environmental resource area (herein Resource) to be affected or created by an alternative (USAEC 2004b, 3-17 to 3-18). These descriptions are referred to as the "affected environment" and are summarized in Chapter 3 of this EA. The "affected environment" should include:

- Relevant information on the general location and environmental setting of the natural and built environment;
- Sufficient background to understand context and intensity of the potential effects on the Resource; and
- A clear description of the environmental baseline or current conditions under the No Action Alternative.

CEQ regulations<sup>6</sup> indicate that the determination of a significant effect is a function of both context and intensity. Context can refer to society as a whole (national), the affected region, affected interests or locality (USAEC 2004b, 3-21). Context also considers duration. Short-term effects are transitory, of limited duration, and typically associated with construction; while long-term effects occur or continue to occur over an extended period of time and may be associated with construction and/or operations. Intensity refers to the severity of the effect, and considers many factors:

- Whether the effects are beneficial or adverse;
- Influence of the effects on public health or safety;
- Unique characteristics of a geographic region;
- Degree to which effects are controversial;
- Uncertainty regarding effects;
- Potential of an action to create precedent; and
- Compliance with federal, state, and local laws (USAEC 2004b, 3-23 to 3-24).

Three different types of effects are evaluated under NEPA. Direct effects are "...caused by the action and occur at the same time and place"<sup>7</sup> (USAEC 2004b, 3-20 to 3-24). Indirect effects are caused by the action, but are later in time and further removed in distance from the action. Cumulative effects are the result of "...the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or persons undertakes the actions."<sup>8</sup> Under NEPA, the term effects and impacts are synonymous. Effects can be beneficial or adverse.

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<sup>5</sup> 40 CFR § 1502.15.

<sup>6</sup> 40 CFR § 1508.27.

<sup>7</sup> 40 CFR § 1508.8.

<sup>8</sup> 40 CFR § 1508.7.

The level of documentation for the "affected environment" and "environmental effects" or description of effects should be commensurate with the extent of the potential effects. Chapter 3 provides an overview of the "affected environment" for each Resource present in the Region of Influence (ROI). The ROI is defined as the geographic region where most of the direct and indirect effects of the Proposed Action are likely to occur (USAEC 2004b, 3-10). For this EA, the ROI is generally defined as a 1,000-ft buffer around the Installation (Figure 3.1-1). The 1,000-ft buffer was established to generally address temporary air, noise, and stormwater effects during construction as well as aesthetic, land use, and health and safety considerations. Fifteen WVRAs extend beyond the Installation boundary within the 1,000-ft buffer area. If a specific Resource has a unique ROI, the defined Resource-specific ROI and its rationale are explained in Chapter 3.

The following terminology has been used to characterize the level of an effect:

- No impact, no measurable or other effect would occur;
- Negligible, a short-term or long-term effect would occur below measurable levels;
- Less than significant, a greater than negligible but less than significant effect would occur with or without mitigation based upon the Resource, context, and intensity; and
- Significant, a permanent effect which cannot be mitigated and/or violates regulations would occur.

The Resources that are expected to incur no impact, negligible effect, or less than significant effect are summarized in Chapter 3. These Resources have been excluded from detailed analysis of potential effects in Chapter 4. Each of the Resources presented in Chapter 3 includes an introduction that summarizes the relevant regulations and affected environment; a description of effects under the No Action Alternative; a description of effects under the Proposed Action; and a finding of effect for detailed analysis in Chapter 4. The finding of effect considers avoidance and minimization of impacts, including BMPs.

If the No Action Alternative and Proposed Action could potentially cause a significant effect with or without BMPs, more information on that Resource is provided in Chapter 4. Significant effects on Resources and the cumulative impact analysis, as appropriate, are described in Chapter 4.

Coastal resources, including Coastal Barrier Systems, are not present within the ROI as the Installation is nearly 500 miles from the Gulf of Mexico. Therefore, coastal resources would not be affected and are excluded from further analysis (U.S. Fish and Wildlife Service [USFWS] 2015a, 1).

For the purposes of the analysis conducted in this EA, the No Action Alternative's individual components are analyzed and included in the description of the Proposed Action. The Proposed Action also includes an analysis of three additional proposed components: the construction and maintenance of proposed firebreaks; the construction and maintenance of WVRAs; and programmatic aerial spraying or aerial application of herbicides.

### 3.2 Airspace Use

*Introduction:* The Federal Aviation Administration (FAA) manages all airspace within the U.S. and its territories. Airspace is defined in vertical and horizontal dimensions, and also by time. The FAA recognizes the military's need to conduct certain flight operations and training within airspace that is separated from that used by commercial and general aviation. Airspace is a finite resource and must be managed to achieve equitable allocation among commercial, general aviation, and military needs.

Airspace use within the immediate area surrounding the Installation is influenced by the proximity of the Lawton-Fort Sill Regional Airport (LAW), south of the Installation; the Henry Post Army Airfield (AAF) on Fort Sill; and the Wichita Mountains NWR, northwest of the Installation. LAW is surrounded by Class D airspace with a 3,700-ft ceiling (Figure 3.2-1a; Figure 3.2-1b) (FAA 2015, 1). Fort Sill has submitted a FNSI to the FAA requesting to expand R-5601 by adding two Special Use Airspaces (SUAs), R-5601G and R-5601-H (Leidos Engineering LLC 2014, 2-3 to 3-6). Upon finalization of the FNSI, airspace around Henry Post AAF would no longer be Class D.

The FAA develops plans and policies for the use of navigable airspace and assigns the use of the airspace necessary to ensure the safety of aircraft and the efficient use of airspace.<sup>9</sup> Fort Sill is the Using Agency for R-5601, and the Fort Worth Air Route Traffic Control (ARTC) Center is the Controlling Agency. In accordance with 14 CFR Part 73.13-17, the FAA established procedures for joint use of R-5601 by Fort Sill and the Fort Worth ARTC (Louis Berger Group, Inc. 2013, 3-7 to 3-9).<sup>10</sup> Under these procedures, Fort Sill would release R-5601, or subareas A, B, C, D, and E, to the Fort Worth ARTC when the areas are not in use, during severe weather, and for emergency traffic situations. The Fort Worth ARTC would return the use of R-5601 to Fort Sill upon request. The primary aircraft that use the current R-5601 are aircraft flown by the Introduction to Fighter Fundamentals students and 301<sup>st</sup> Fighter Wing. In addition to the F-16, F-18, and AT-38 aircraft, the existing Restricted Area (RA) complex is currently used to operate Unmanned Aerial Systems (UASs). Fort Sill currently completes approximately 300 UAS sorties per year in the existing R-5601 complex (Louis Berger Group, Inc. 2013, 3-7 to 3-9).

*No Action Alternative:* The No Action Alternative would have no impact on existing airspace use as no new aerial spraying operations or changes in aviation resources would occur.

*Proposed Action:* Although airspace would be utilized for aerial herbicide application under the Proposed Action, each application would happen on a pre-approved, case-by-case basis, and would occur in the existing RA. The election to apply herbicides would be based in part on the presence of UXO and the difficulty in accessing areas for manual or mechanical removal. The Proposed Action would not cause any changes to airspace designations as the herbicide application would occur within existing operating windows. No changes to navigable airspace including flight altitudes and course, military training routes, area of navigable airspace, or

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<sup>9</sup> 49 USC § 40103

<sup>10</sup> 14 CFR § 73.

approach and departure patterns of nearby airports would result from the Proposed Action. The Proposed Action would result in negligible impacts to airspace use.

*Detailed Analysis Finding:* Based on the findings above, airspace use is eliminated from detailed analysis in this EA.

### 3.3 Air Quality

*Introduction:* Air quality is a measure of the concentrations of various criteria pollutants present in a given atmosphere. The U.S. Environmental Protection Agency (EPA) Region 6 and the Oklahoma Department of Environmental Quality (ODEQ) regulate air quality in Oklahoma. The Clean Air Act (CAA), 42 USC 7401–7671q, as amended, requires the EPA to establish the primary and secondary National Ambient Air Quality Standards (NAAQS) to protect and promote the health and welfare of humans and the environment.<sup>11</sup> The NAAQS set acceptable concentration levels for seven common criteria air pollutants: fine particles, or particulate matter with a diameter less than or equal to a nominal 10 micrometers (PM<sub>10</sub>), very fine particles, or particulate matter with a diameter less than or equal to a nominal 2.5 micrometers (PM<sub>2.5</sub>), sulfur dioxide, carbon monoxide, nitrous oxides, ozone, and lead. Short-term standards (1-, 8-, and 24-hour periods) have been established for pollutants that contribute to acute health effects, and long-term standards (annual averages) have been established for pollutants that contribute to chronic health effects.

Each state is responsible for achieving and maintaining NAAQS, and each state has the authority to adopt standards stricter than those established under the federal program. However, Oklahoma accepts the federal standards. Federal regulations designate Air Quality Control Regions (AQCRs) that are in violation of the NAAQS as nonattainment areas, those in compliance with the NAAQS as attainment areas, and those that cannot be classified based on available information as unclassifiable areas (U.S. Army Corps of Engineers [USACE] 2006, 4-8 to 4-13).

The Installation is located within the Southwestern Oklahoma Intrastate AQCR (AQCR 189).<sup>12</sup> As of August 6, 2015, AQCR 189 is listed as an attainment area for all criteria pollutants.<sup>13</sup> Comanche County has not been identified as a nonattainment area for any criteria pollutants since data were available in 1978 and the entire state of Oklahoma has been in attainment since 1991 (EPA 2015a, 1). PM<sub>2.5</sub> and ozone levels for the Installation are typically lower than the state average (EPA 2015b, 1-2). Because the Installation is in an attainment AQCR and is not located within an EPA-designated ozone transport region, an air conformity analysis is not required.

Air emissions at the Installation include those from stationary and mobile sources. The stationary sources include combustion sources, fuel storage and transfer, and operational sources. The mobile sources include vehicles and aircraft operations, including routine training

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<sup>11</sup> CAA, 42 USC 7401–7671q; 40 CFR § 50.

<sup>12</sup> 40 CFR § 81.125.

<sup>13</sup> 40 CFR § 81.337.

operations, firebreak maintenance activities, and occasional aerial spraying for honey mesquite. Two aerial spraying events at the Installation were conducted by rotary-wing (helicopter) aircraft; however, fixed-wing (piston-powered) aircrafts are available (Boving and Winterfield 1972, 1).

The primary source of emissions at the Installation is the range activities associated with artillery maneuvering, firing, and projectile explosions (Leidos Engineering LLC 2014, 3-9). These activities are conducted in the center of the Installation for safety reasons. Prevailing winds in Comanche County are from the south and southeast (13% and 14%, respectively) for most of the year, averaging 11.1 miles per hour. Northerly winds are also common (10% annually), especially during the month of February (Oklahoma Climatological Survey 2015, 1-4). While centrally-located operations help reduce migration of resulting particulate matter, including PM<sub>2.5</sub> and PM<sub>10</sub>, off the Installation, migration towards the City of Lawton and Medicine Park is likely during periods of high winds and dry climate.

The Installation tracks air emissions from stationary emission sources, including boilers, emergency generators, aboveground storage tanks for fuel, degreasing operations, spray paint booths, and the burning of unused munitions powder (USACE 2006, 4-8 to 4-13). Mobile source emissions from passenger vehicles and trucks used at Fort Sill are accounted for under the Oklahoma State Implementation Plan, which is a separate air quality tracking mechanism.

A letter was sent to the ODEQ Air Quality Division requesting feedback on the Proposed Action on August 25, 2015. The agency responded on September 22, 2015 with information about the Open Burning Rule in effect at the Installation (Appendix B). Under the Open Burning Rule, open burning is allowed for the elimination of hazards and land management if prior authorization is obtained from the local fire chief. Approving parties are the Fort Sill Fire Department and the ODEQ. This includes fire hazards that cannot be abated by any other means per communication with Mr. Al (Scott) Sherman, Air Program Manager for Fort Sill, September 29, 2015. Currently, prescribed burning is performed for wildfire and wildlife habitat management. Prescribed burns are weather-dependent and typically are scheduled for mid-February through the beginning of spring when adequate soil moisture is present.

Out-leased agricultural areas and firebreaks are also used as a method of fire mitigation. The Installation contains approximately 5,000 acres of out-leased agricultural areas, most of which are native grass or hay that the leaseholder mows and processes for sale. Crop production also occurs in these leased areas. Existing firebreaks are generally disced or bladed twice annually (Gene Stout and Associates 2013, 56). Air emissions, such as smoke from prescribed burns and exhaust from agricultural equipment and vehicles used for firebreak maintenance, occur throughout the Installation as a result of these operations.

*No Action Alternative:* No additional man-made emission sources or air pollutants would be introduced under the No Action Alternative. Wildfires may occur without additional fire mitigation. In the case of wildfires, temporary impacts due to smoke would be anticipated, but would dissipate soon after the wildfire event. The No Action Alternative would not introduce new fire-fighting equipment, techniques, or methods in addition to those currently in place. Therefore, the No Action Alternative would result in negligible impacts to air quality.

*Proposed Action:* During implementation of the Proposed Action, short-term impacts to air quality are anticipated from additional on-and off-road equipment exhaust, dust, mechanical equipment, aircraft emissions, and airborne herbicides. Examples of on-and off-road equipment include trucks, tractors, and backhoes. Construction components would be associated with fuel removal via mechanical and/or manual treatments, including mulching, grinding, thinning of vegetation with chainsaws and hand tools, and transportation of removed vegetation to the appropriate facility (see Section 3.15.4 for additional information regarding solid waste). These activities often result in an increase of particulate matter dust and cease once the construction period ends. The majority of dust would be in the immediate vicinity of the activities. However, depending on wind speed and direction, climate conditions, time of year, and proximity to the Installation boundary, dust could travel off the Installation to surrounding areas.

For most of the year, the Proposed Action would cause an increase in particulate matter around the Wichita Mountains NWR, the City of Elgin, and Town of Medicine Park due to prevailing winds. Any construction or maintenance performed during winter months, such as January or February, could cause a temporary increase in particulate matter to the south, including the cities of Lawton and Cache, and the Town of Indianola.

Aerial spraying of herbicides would be evaluated on a case-by-case basis by the Fort Sill EQD, the Fort Sill PMO, and the USAEC entomologist to ensure compliance with the IPMP. Although areas would be prioritized where mechanical removal or ground-level spraying is impracticable due to UXO and severe undergrowth, aerial spraying could potentially occur anywhere on the Installation. Aircraft emissions and herbicides could drift away from the targeted areas during aerial spraying and may drift off the Installation during certain conditions. Only approved herbicides listed in the IPMP would be applied when wind speeds are within the appropriate range, and would comply with existing hazardous materials policies to minimize any potential effect (Section 3.8).

The Proposed Action would result in short-term, minimal, and localized impacts to air quality which would have a less than significant effect on the ROI.

*Detailed Analysis Finding:* Based on the findings above, air quality is eliminated from detailed analysis in this EA.

### **3.4 Biological Resources (Terrestrial)**

The terrestrial biological resources have been divided into vegetation, threatened and endangered plant species, terrestrial wildlife, threatened and endangered wildlife species, and natural resource areas for the purposes of this evaluation.

#### **3.4.1 Vegetation**

*Introduction:* The vegetation at Fort Sill provides a diversity of habitat for the wildlife that occurs on the Installation. The vegetation within the boundaries of the ROI is primarily made up of grassland communities including tall grass and short grass prairies. The dominant tall grass species include big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*),

switchgrass (*Panicum virgatum*), and indian grass (*Sorghastrum nutans*) (Gene Stout and Associates 2013, 42 to 45). The dominant mid- and short grass species include blue grama (*Bouteloua gracilis*), sideoats grama (*B. curtipendula*), and fall witchgrasses (*Leptoloma cognatum*). Dense woodlands are found throughout the Installation along streams and some sandy, gravelly, and stony upland areas. The woodlands along streams are dominated by elm species (*Ulmus* spp.), pecan (*Carya illinoensis*), hackberry (*Celtis occidentalis*), red oak (*Quercus shumardii*), blackjack oak (*Q. marilandica*), bur oak (*Q. macrocarpa*), and post oak (*Q. stellata*). The dominant trees found in the upland areas are blackjack oak and post oak, with an understory of grasses, forbs, and woody shrubs. In addition, honey mesquite (*Prosopis glandulosa*) is found in disturbed areas and on many hardland and slickspot soils and Eastern red cedar (*Juniperus virginiana*) occurs on all soil types (Gene Stout and Associates 2013, 42 to 45). Table 3.4-1 and Figure 3.4-1 show the vegetation types within the ROI based on the National Land Cover Data (NLCD) (Homer et al. 2015 [Geographic Information System (GIS)]).

*No Action Alternative:* The No Action Alternative would continue the existing fire hazard mitigation focused primarily on maintaining areas where vegetation has already been removed or is targeted for control. Therefore, a negligible impact on the vegetation at Fort Sill would occur.

*Proposed Action:* The Proposed Action would remove an estimated 37 acres or 0.37% of existing deciduous forest, 289 acres or 0.39% of herbaceous vegetation, and 2 acres or 0.09% of shrub scrub land cover to construct firebreaks and WVRAs (Homer et al. 2015 [GIS]). Other affected land cover includes open water, and developed lands totaling 131 acres.

The programmatic application of herbicides using aerial spraying would also remove some vegetation on a case-by-case basis. However, the implementation of industry standard BMPs to control soil erosion and preserve surrounding vegetation would minimize the effects on nearby vegetation during construction and maintenance of WVRAs and firebreaks (Gene Stout and Associates 2013, 51 to 52). In addition, the impact is expected to be small relative to the overall vegetation community at Fort Sill and should not impact diversity. Therefore, the Proposed Action is anticipated to have a less than significant impact on the vegetation within the ROI.

*Detailed Analysis Finding:* Based on the findings above, vegetation is eliminated from detailed analysis in this EA.

### **3.4.2 Threatened and Endangered Plant Species**

*Introduction:* The USFWS has legislative authority to list and monitor the status of species whose populations are considered to be imperiled. This federal legislative authority for the protection of threatened and endangered species stems from the Endangered Species Act (ESA) of 1973, and its subsequent amendments. Regulations supporting this Act are codified and regularly updated in 50 CFR §§ 17.11 - 17.12.<sup>14</sup> The federal process stratifies potential candidates based upon the species' biological vulnerability. Species listed as endangered or threatened are provided full protection under the law. This protection not only prohibits the

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<sup>14</sup> 50 CFR §§ 17.11 - 17.12.

direct possession (take) of a protected species, but also includes a prohibition of indirect take such as destruction of designated critical habitat. Listed plant species are not protected from take, although it is illegal to collect or maliciously harm them on federal land. The ESA and accompanying regulations provide the necessary authority and incentive for individual states to establish their own regulatory vehicle for the management and protection of threatened and endangered species.

"Endangered" means a species is in danger of extinction throughout all or a significant portion of its range. "Threatened" means a species is likely to become endangered within the foreseeable future. All federal agencies are required to implement protection programs for designated species and to use their authority to further the purposes of the ESA. The USFWS maintains a list of special-status species considered endangered, threatened, or candidate. "Candidate" species include plants and animals that have been studied and are proposed by the USFWS as new federal endangered and threatened species.

According to the Oklahoma Department of Wildlife Conservation (ODWC) and the USFWS, there are no threatened or endangered plant species with the potential to occur in Comanche County (ODWC 2015b, 5 to 6; USFWS 2015b, 1). However, three non-listed plant species of special concern are potentially located within the ROI: dodder (*Cuscuta* spp.), Oklahoma beardtongue (*Penstemon oklahomensis*), and Hall's bulrush (*Schoenoplectus hallii*) (Gene Stout and Associates 2013, 42 to 51). During a 1993 survey, Oklahoma beardtongue was confirmed at nine sites at Fort Sill. During 2000 and 2012 surveys, Hall's bulrush was confirmed at two sites at Fort Sill. Dodder has not been documented on the Installation, but it was confirmed north of the boundary fence in the Wichita Mountains NWR. The Installation would continue to coordinate with USFWS regarding species of special concern to prevent future impacts.

*No Action Alternative:* The No Action Alternative would have no impacts to threatened and endangered plant species as none of these species are present at the Installation. Furthermore, the No Action Alternative would have a less than significant impact on dodder, Oklahoma beardtongue, or Hall's bulrush due to continued monitoring of the plant species at Fort Sill.

*Proposed Action:* The Proposed Action would have no impacts to threatened and endangered plant species as none of these species are present in the area of proposed construction. Further, the Proposed Action would have a less than significant impact on dodder, Oklahoma beardtongue, or Hall's bulrush because none of these species have been identified in the proposed firebreaks and WVRAs (Gene Stout and Associates 2013, 42 to 51). The Installation or its contractors would apply herbicides using aerial spraying during low-wind conditions (Section 3.3) to reduce drift of herbicide spray into untargeted areas. The Installation would continue to coordinate with USFWS regarding plant species of concern to identify those areas to be avoided during construction and operation of firebreaks, where feasible. Species of special concern identified in WVRAs at the Installation or adjoining areas would be avoided during implementation of the Proposed Action to prevent impacts to these species.

*Detailed Analysis Finding:* Based on the findings above, threatened and endangered plant species are eliminated from detailed analysis in this EA.

### 3.4.3 Terrestrial Wildlife

*Introduction:* The Installation is bordered by the Wichita Mountains NWR to the northwest, which allows for a variety of occasional wildlife visitors to Fort Sill. A list of the common terrestrial species, including herpetological species (amphibians and reptiles), mammalian species, and avian species, with the potential to inhabit the ROI are included in Appendix F, and a summary of the potential effects is provided below.

#### Herpetological (Amphibians and Reptiles) Species

A herpetological survey was performed in 1991 to document herpetological species observations at Fort Sill (Appendix F). The survey included 92 field locations and resulted in the collection or verified sightings of a total of 45 species (Gene Stout and Associates 2013, 68 to 89).

#### Mammalian Species

A wide variety of natural habitats at Fort Sill lends to a diversity of mammal species including game species, and various herbivores and carnivores (Appendix F). There are 24 mammalian species known to occur on Fort Sill (Gene Stout and Associates 2013, 68 to 89, 237 to 244).

#### Avian Species

The USFWS has legislative authority to prohibit, unless permitted by regulations, the kill, capture, collection, possession, buying, selling, trading, or transport of any migratory bird, nest, young, feather, or egg in part or in whole. The Migratory Bird Treaty Act (MBTA) of 1918 and its subsequent amendments provide the federal legislative authority for protection of migratory bird species.<sup>15</sup> Regulations supporting this Act are codified and regularly updated in 50 CFR § 10 and 50 CFR § 21.<sup>16, 17</sup>

The Bald and Golden Eagle Protection Act (BGEPA) provides for the protection of the bald eagles (*Haliaeetus leucocephalus*) and the golden eagles (*Aquila chrysaetos*) by prohibiting the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part, nest, or egg.<sup>18</sup>

The State of Oklahoma is within the Central Flyway migration corridor (USFWS 2012a, 1 to 2). The Central Flyway is an established avian corridor between Canada and Mexico in which birds complete an annual migration with the change of the seasons. Oil and gas activities and wind energy development in the region have impacted migratory bird species through habitat alteration and fragmentation. Appendix F lists the avian species with potential to inhabit the ROI.

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<sup>15</sup> MBTA, 16 USC §§ 703-712.

<sup>16</sup> 50 CFR § 10.

<sup>17</sup> 50 CFR § 21.

<sup>18</sup> BGEPA, 16 USC § 668.

The Installation is home to a wide variety of terrestrial species and provides resources for species migrating through Fort Sill.

*No Action Alternative:* The removal of vegetation for fire fuel control, leasing of agricultural land, and maintenance of existing WVRAs and firebreaks have the potential to remove habitat that wildlife could utilize for shelter, breeding, or foraging and displace individuals in work areas. Noise levels would temporarily increase near work areas (Section 3.11). However, this increase is not anticipated to impact wildlife long-term.

Furthermore, the number of individuals impacted would be small relative to the overall population size, and would not have long-term effects on population viability and diversity. To prevent adverse effects on migratory birds and protected eagles, the Installation's *Integrated Natural Resource Management Plan* (INRMP) requires all work to comply with the MBTA and the BGEPA (Gene Stout and Associates 2013, 98 to 100). The INRMP includes a BMP requiring construction and other potentially disruptive activities to occur outside of breeding season. Therefore, the No Action Alternative would have a less than significant effect on terrestrial wildlife and migratory birds within the ROI.

*Proposed Action:* Construction of the Proposed Action would remove some vegetation and associated habitat (Section 3.4.1). The programmatic aerial spraying would remove woody vegetation and habitat from individual areas. Short-term, less than significant decreases in air quality (Section 3.3); the possibility of accidental releases of herbicide which would be minimized by industry standard BMPs (Section 3.7); and temporary, less than significant increases in noise levels (Section 3.11) would also occur within the ROI. However, the number of individuals impacted would be small relative to the overall population size and would not have a long-term effect on population viability and diversity. Therefore, the Proposed Action would have a less than significant impact on the terrestrial wildlife and migratory birds that occur in the ROI.

*Detailed Analysis Finding:* Based on the findings above, terrestrial wildlife is eliminated from detailed analysis in this EA.

#### **3.4.4 Threatened and Endangered Terrestrial Species**

*Introduction:* The ESA, previously discussed in Section 3.4.2, protects threatened and endangered terrestrial species. This protection not only prohibits the taking of a protected species, but also includes a prohibition of indirect take such as destruction of designated critical habitat.<sup>19</sup> No federal candidate species are listed for Comanche County. There are no state listed species within Comanche County (ODWC 2015b, 5 to 6). There are five terrestrial species listed as federally threatened or endangered that have the potential to, or have historically occurred, within Comanche County (USFWS 2015b, 1). These species are listed in Appendix F. No critical habitat designated by USFWS is located in the ROI (USFWS 2015d, 1).

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<sup>19</sup> 50 CFR §§ 17.11 - 17.12.

Historically, endangered species in the region are subject to impacts from livestock grazing activities, oil and gas development, fire mitigation activities, and wind energy development.

The Oklahoma Biological Survey is responsible for maintaining the Oklahoma Natural Heritage Inventory (ONHI), including listed species occurrence. This database was reviewed to assess the potential for listed threatened and endangered species occurrence in the ROI. These results do not mean that there is an absence of threatened or endangered species, and these data should not be used for presence/absence determinations. Of the five federally listed terrestrial species with potential to occur in Comanche County, the BCVI is the only species documented to occur on the Installation (ONHI 2014, [GIS]).

### Black-Capped Vireo

BCVI nesting habitat consists of scattered trees and dense clumps of shrubs growing to ground level. These clumps are interspersed with open areas of bare ground, rock, grasses, or forbs creating a patchy pattern. The most important aspect of the BCVI nesting habitat is that it must include vegetation that extends to the ground since most nests are located within approximately 4 ft of the ground surface (Balbach and Keane 2007, 9). Threats to the continued existence of BCVIs include nest parasitism by brown-headed cowbirds, loss of successional-stage habitat, and deterioration of habitat through fire suppression, overgrazing, and urban development (Grzybowski and Tazik 1993, 6).

The BCVI was first documented in the Wichita Mountains around 1929 and on the Installation in 1943 (Grzybowski et al, 2014, 5). A study to fully document the status of BCVIs on the Installation was initiated by the U.S. Army in 1988 (Grzybowski and Tazik 1993, 6). Annual reports are completed to evaluate the distribution, abundance, dispersal, minimum survival, habitat requirements, and reproductive success of BCVIs on the Installation (Grzybowski and Tazik 1993, 6). Monitoring BCVI populations continues to be a high priority for Fort Sill. The Installation has completed annual surveys for BCVIs during the nesting season since the first systematic search of suitable habitat was conducted in 1988. These studies have continued through 2014 providing guidance for habitat management and cowbird control helping the BCVI population recover in the Wichita Mountains (Grzybowski et al. 2014, 6). The population that breeds on the Wichita Mountains NWR, the Installation, and adjacent private properties make up approximately 98% of the breeding pairs of BCVIs in the State of Oklahoma (Grzybowski et al. 2014, 6). BCVI monitoring is planned to continue for the foreseeable future (Grzybowski et al. 2014, 6).

Approximately 16,000 acres of potential BCVI habitat are present on the Installation (Figure 3.4-2). These areas were surveyed in 2013 and 2014. The number of BCVI territories detected increased from 581 in 2013 to 603 in 2014. From April 30 to August 3, 2014, 40 territories were monitored for pairing and nest activity on the Installation. Pairing in these territories was 100%, and 31 of the territories fledged young (Grzybowski et al. 2014, 10 to 22).

Critical habitat for BCVI is not designated on Fort Sill. However, the protection of breeding areas and surrounding habitat has been established. A Biological Assessment (BA) prepared by the Fort Sill Natural Resources and Enforcement Branch was approved by the USFWS in 1996.

Based on the BA, the USFWS issued Biological Opinion (BO), Number 2-4-96-F-57, on March 16, 1998 stating that the effects of military-associated activities at Fort Sill are not likely to jeopardize the continued existence of the BCVI. In compliance with BCVI management practices, Fort Sill would continue to comply with the reasonable and prudent measures and associated terms and conditions outlined in the BO (Fort Sill 2014, 89 to 98). These measures include:

- Annually survey and monitor current numbers, age structure, population trends, and distribution;
- Areas designated as BCVI territories must not contain points used as destinations by troops involved in training;
- BCVI territories are limited-use areas from April to July;
- Continue designation of no off-road maneuvers for BCVI areas;
- Continue to ensure the Explosive Ordnance Demolition area does not put individuals or habitat in jeopardy;
- If nesting territories have been burned more than one time in the past five years, any demolition occurring must be accompanied by adequate protection against accidental wildfire; and
- Continue the ongoing cowbird trapping program within or adjacent to nesting areas by including trapping, shooting, and cowbird egg and nestling removal with an annual report of trapping results submitted to the USFWS.

*No Action Alternative:* The No Action Alternative would not result in long-term, direct effects on BCVI population viability and diversity as it includes the BO measures described above. Additionally, Fort Sill has prepared an *Endangered Species Management Plan* that provides guidelines for maintaining and enhancing populations and habitats of the BCVI and other special status species on the Installation, while maintaining mission readiness consistent with ARs and other federal environmental regulations. Furthermore, the Installation complies with the obligations of the MBTA and ESA as well as implements the reasonable and prudent measures detailed in the INRMP. Therefore, the No Action Alternative would have a less than significant effect on BCVI.

*Proposed Action:* The Proposed Action would not result in long-term, direct effects on population viability and diversity of the BCVI as the BO measures described above would be followed. In addition to the obligations of the MBTA and ESA, Fort Sill would also follow the *Endangered Species Management Plan* and INRMP. Therefore, the Proposed Action would have a less than significant impact on BCVI.

*Detailed Analysis Finding:* Based on the findings above, the BCVI is eliminated from detailed analysis in this EA.

### Migratory Birds

*Introduction:* Threatened and endangered migratory birds, including the whooping crane, winter on the central Texas Gulf Coast. They use a variety of habitats during migration including croplands, palustrine wetlands of varying sizes, and other riverine habitats (USFWS 2012b, 18 to

19). The ROI lies within the normal migration corridor for the whooping crane and other migratory birds (USFWS 2012b, 14). Based on email communication with Mr. Deurmyer, Wildlife and Fisheries Biologist for Fort Sill, on February 5, 2016, threatened and endangered migratory birds have not been observed within the Installation.

*No Action Alternative:* Mechanical removal, herbicide treatment, agricultural leasing and maintenance of existing WVRAs and firebreaks are not anticipated to remove habitat the whooping crane may utilize as stopover habitat during migration. The whooping crane has not been observed within the Installation. Noise levels would temporarily increase near work areas (Section 3.11). However, this increase is not anticipated to cause long-term impacts to the whooping crane.

To prevent adverse effects on migratory birds, the Installation's INRMP requires all work with the potential to impact these species comply with the MBTA (Gene Stout and Associates 2013, 98 to 100). The INRMP includes a BMP requiring construction and other potentially disruptive activities to occur outside of breeding season. Therefore, the No Action Alternative would have a less than significant effect on the whooping crane.

*Proposed Action:* The construction of six new interior firebreaks would not result in the loss of potential stopover habitat as these are narrow linear corridors and not large expanses of land. In addition, based on verbal communication with Mr. Lee Silverstrim (Fort Sill) on February 19, 2016, no impacts to potentially jurisdictional wetlands, which serve as potential stopover habitat, are anticipated as a result of the new WVRAs. Short-term, less than significant decreases in air quality (Section 3.3); the possibility of accidental releases of herbicide that would be controlled by the implementation of industry-standard BMPs (Section 3.7); and temporary, less than significant, increases in noise levels (Section 3.11) may also occur within the ROI.

As stated previously, the Installation's INRMP requires all activities to comply with the MBTA. Threatened and endangered migratory birds have not been observed within the Installation and the proposed actions are not anticipated to impact potential stopover habitat; as a result, the Proposed Action would have a less than significant impact on migratory birds.

*Detailed Analysis Finding:* Based on the findings above, threatened and endangered migratory birds are eliminated from detailed analysis in this EA.

### **3.4.5 Natural Resource Areas**

*Introduction:* The USFWS's Information, Planning, and Conservation (IPaC) system summarizes any national refuge lands, coastal barrier resource units, and invasive species management practices. The IPaC system identified the Wichita Mountains NWR as a Natural Resource AOC (USFWS 2015c, 1 to 8). The National Wildlife Refuge System, managed by the USFWS, is the nation's premier system of public lands and waters set aside to conserve America's fish, wildlife, and plants.

The Wichita Mountains NWR is approximately 59,020 acres in size and borders the northwestern boundary of the Installation. The refuge was established in 1901 and provides mixed grass prairie habitat. It contains a diversity of more than 50 mammalian species, 240

avian species, 64 herpetological species, 36 fish species, and 806 plant species (USFWS 2015e, 1). The endangered BCVI is one of the more heavily monitored species found in the Wichita Mountains NWR. The BCVI arrive in late April and early May of each year to find mates, establish nests, and raise young. The BCVI remain in the area through August and then travel to their wintering grounds.

In addition, the James A. Manning State Fish Hatchery is located within the ROI along the north-central boundary of the limits of Medicine Park.

*No Action Alternative:* Typically, maintenance activities do not take place near the boundary of the Wichita Mountains NWR or James A. Manning State Fish Hatchery, and all work complies with the MBTA and BGEPA. Noise levels would continue to increase during the mechanical removal of vegetation and aerial spraying; however, this increase is not anticipated to impact wildlife species long-term. Therefore, the No Action Alternative is anticipated to have a less than significant impact on the natural resource areas and the wildlife that inhabit these areas.

*Proposed Action:* The construction of the firebreaks would not take place inside the boundary of the Wichita Mountains NWR, but one WVRA would take place along a small portion of the boundary of the Wichita Mountains NWR. One of the firebreaks directly abuts the James A. Manning Fish Hatchery (Google Maps 2015 [GIS]). However, the construction and maintenance of the WVRA would not take place within the hatchery. In addition, all work would comply with the ESA, MBTA, and BGEPA, and INRMP BMPs would be implemented to minimize stream and water quality impacts upstream of the proposed construction (Section 3.17). Short-term, less than significant decreases in air quality (Section 3.3); the possibility of accidental releases of herbicide which would be minimized by industry standard BMPs (Section 3.7); and temporary, less than significant increases in noise levels (Section 3.11) may also occur within the ROI. The amount of habitat and number of individuals impacted is expected to be small and not anticipated to have an effect on population viability and diversity. Therefore, the Proposed Action would have a less than significant impact on the natural resource areas and the wildlife that inhabit these areas.

*Detailed Analysis Finding:* Based on the findings above, natural resource areas are eliminated from detailed analysis in this EA.

### **3.5 Biological Resources (Aquatic)**

The aquatic biological resources section has been divided into surface water, aquatic wildlife, and threatened and endangered aquatic species for the purposes of this evaluation.

#### **3.5.1 Surface Water**

*Introduction:* Waters of the U.S. (WOTUS) are defined as all waters and wetlands currently used or that have been used in the past for interstate and foreign commerce, all interstate waters and wetlands, and all other waters, the use or degradation of which could affect interstate or

foreign commerce.<sup>20</sup> Perennial, intermittent, and ephemeral streams as well as lakes, ponds, and wetlands are potential WOTUS that may be subject to jurisdiction by USACE pursuant to Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act.

The Installation is located in the Red River drainage basin. Cache Creek is the primary tributary of the Red River that drains the Lawton-Fort Sill area flowing north to south (Gene Stout and Associates 2013, 58 to 62). Cache Creek has two main forks, East Cache and West Cache. Approximately 52% of the Installation is in the East Cache Creek watershed, approximately 40% is in the West Cache Creek watershed, and approximately 8% is in the Beaver Creek watershed. Additional significant streams occurring on the Installation include Beef Creek, Blue Beaver Creek, Rock Creek, Medicine Creek, and Post Oak Creek.

There are approximately 219 ponds and lakes on the Installation ranging from less than 1 acre to the 333-acre Lake Elmer Thomas that is located on the north central boundary of the Installation within the ROI (Gene Stout and Associates 2013, 58 to 62). Additional significant lakes and ponds include Lake George, Ketch Lake, West Lake, Menard, Engineer, Logan, and Pottawatomie Twins. Of the 219 ponds and lakes, 142 are managed as fisheries, while others are designated as wildlife use (Gene Stout and Associates 2013, 58 to 62).

According to the USFWS National Wetland Inventory (NWI), there are approximately 452 wetlands on the Installation that are divided into six different wetland types (USFWS 2014 [GIS]). These six wetland types fall into three broad categories: palustrine (136 acres), riverine (26 acres), and lacustrine (761 acres). The palustrine system includes all non-tidal wetlands dominated by trees, shrubs, and emergents (herbaceous plants). The riverine system includes all wetlands and deep water habitats contained within a channel, except for wetlands dominated by trees, shrubs, persistent emergent, emergent moss, or lichens and habitat with water containing ocean derived salts in excess of 0.5% (Cowardin, et al. 1979, 4 to 10). The lacustrine system includes wetlands and deepwater habitat that are situated in a topographic depression or dammed river channel; lacks trees, shrubs, persistent emergent, emergent mosses, or lichens greater than 30% coverage; and total area exceeds 20 acres (Cowardin, et al. 1979, 4 to 10). Figures 3.5-1 through 3.5-3 show the aquatic habitat on the Installation.

*No Action Alternative:* Ongoing activities would result in long-term, minor impacts to surface water and water quality (Section 3.17). The impacts to surface water and water quality would be temporary and localized as a result of herbicide application and firebreak maintenance. As described in the *Fort Sill Surface Water Management Plan*, BMPs would be implemented to further control the impacts to water quality. Therefore, the No Action Alternative would have a less than significant impact on surface water.

*Proposed Action:* Approximately 3.21 acres of potentially jurisdictional wetland features are located within the boundaries of the proposed fire breaks and WVRAs. Construction of the Proposed Action is not anticipated to impact these potentially jurisdictional features and removal of vegetation associated with these features would be avoided per verbal communication with

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<sup>20</sup> 33 CFR § 328.

Mr. Silverstrim (Fort Sill) on February 19, 2016. Approximately 14,083 linear feet of stream are located within the boundaries of the proposed fire breaks and WVRAs.

All stream features were determined to be ephemeral in nature and construction activities would not occur within the potential jurisdictional limits of these features. The firebreaks would avoid all potentially jurisdictional stream features (OA Systems Corporation [OAS] 2016, 3 to 4). Impacts to stream features associated with the WVRAs are not anticipated to exceed permitting thresholds; however, impacts to potentially jurisdictional wetlands or stream impacts exceeding thresholds would require USACE permit authorization. Based on these findings and communication, the Proposed Action would have a less than significant impact on surface water.

*Detailed Analysis Finding:* Based on the findings above, surface water is eliminated from detailed analysis in this EA.

### **3.5.2 Aquatic Wildlife**

*Introduction:* The lakes and ponds on the Installation have been surveyed extensively and the fish composition is well known. Common aquatic species with the potential to inhabit aquatic resources within the ROI are included in Appendix F. None of these species are listed as threatened or endangered.

*No Action Alternative:* Ongoing activities result in direct and indirect impacts to surface water and water quality, potentially affecting aquatic species survival (Section 3.17). However, these impacts would be short term. All features would be restored to pre-construction contours following maintenance of firebreaks. As described in the Fort Sill *Surface Water Management Plan*, BMPs would be implemented to minimize the impacts to water quality. Therefore, the No Action Alternative would have a less than significant impact on aquatic species.

*Proposed Action:* Construction of the Proposed Action is not anticipated to impact potentially jurisdictional wetlands; therefore, the Proposed Action would avoid aquatic vegetation associated with these features (OAS 2016, 3 to 4). Approximately 14,083 linear feet of stream are located within the boundaries of the proposed fire breaks and WVRAs. All stream features were determined to be ephemeral in nature and construction activities would not exceed permitting thresholds (OAS 2016, 3 to 4).

Based on field determinations made by Fort Sill, the streams that are located within the boundaries of the proposed fire breaks and WVRAs are ephemeral in nature and do not contain aquatic vegetation. In addition, the use of industry standard BMPs and a Stormwater Pollution Prevention Plan (SWPPP), if required (Section 3.7), would be implemented. Therefore, the Proposed Action would have a less than significant impact on aquatic wildlife that occurs on Fort Sill.

*Detailed Analysis Finding:* Based on the findings above, aquatic wildlife is eliminated from detailed analysis in this EA.

### 3.5.3 Threatened and Endangered Aquatic Species

*Introduction:* According to the ODWC and the USFWS, there are no threatened or endangered aquatic species with the potential to occur in Comanche County (ODWC 2015b, 5 to 6; USFWS 2015b, 1).

*No Action Alternative:* No effect to threatened and endangered aquatic species would occur under the No Action Alternative, as none exist at or near Fort Sill.

*Proposed Action:* No direct effect to threatened and endangered aquatic species would occur under the Proposed Action, as none exist at or near Fort Sill.

*Detailed Analysis Finding:* Threatened and endangered aquatic species are eliminated from detailed analysis in this EA.

### 3.6 Cultural and Historic Resources

*Introduction:* Section 106 of the National Historic Preservation Act (NHPA) of 1966 requires federal agencies to consider the effects of undertakings (actions) on historic properties, and allow the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment (ACHP 2013a). This EA requires a Section 106 consultation with the Oklahoma State Historic Preservation Officer (SHPO) because the Proposed Action occurs on federal land. Under Section 106, a unique ROI is established and referred to as the Area of Potential Effect (APE) (ACHP 2013b). The APE includes a project's actions and an area necessary to identify direct, indirect, and cumulative effects on cultural and historic resources as a result of those actions.

Within the Installation, cultural resources are identified and managed under the *Integrated Cultural Resources Management Plan (ICRMP)* (ALL Consulting, LLC 2014, 1-1 to 2-2). The ICRMP establishes procedures to identify historic properties; archeological resources as defined by the Archeological Resource Protection Act, artifacts and associated resources; sacred sites under the American Indian Religious Freedom Act (AIRFA) and EO 13007 Indian Sacred Sites; and Native American remains, objects of cultural patrimony, and other cultural items as defined by the Native American Graves Protection and Repatriation Act (NAGPRA) (ALL Consulting, LLC 2014, 1-1 to 2-2). The ICRMP also establishes SOPs, which include oversight of historic properties, archaeological and architectural/historic surveys, inventory management, and development of Programmatic Agreements for coordination with agencies and tribes, and maintenance and management of cultural resources data. This process allows the Installation to effectively manage and protect cultural resources while achieving its military mission.

Activities at the Installation are required to comply with the ICRMP and its SOPs regardless of location (ALL Consulting LLC. 2014, 1-1 to 5-2). Consequently, an APE was established to evaluate the effects of the Proposed Action which represents a new action not already addressed under the ICRMP.

The Proposed Action includes three proposed components in addition to the components of the No Action Alternative. These components are linear and non-linear. To define the individual APEs for the proposed components, 30-meter (m) buffer on either side of the firebreak

centerlines due to the potential for ground disturbance during construction (Appendix C). The proposed APEs for the WVRAs are the limits of the individual WVRAs as the proposed WVRAs have less potential to disturb ground (Appendix C). A separate APE for the aerial spraying was not established because the activity is not anticipated to disturb archaeological or historic resources. There are no indirect APEs delineated for the Proposed Action since all components will be at ground surface.

To address Section 106 consultation requirements, a coordination letter was sent to the Oklahoma SHPO on October 5, 2015 (Appendix B). SHPO responded on October 22, 2015 indicating that unless conflicting comments were received from the Oklahoma Archeological Survey, they did not find any historic properties affected by the Proposed Action. A response letter dated October 15, 2015 from the Oklahoma Archeological Survey indicated an archaeological field inspection would be necessary due to one cultural resource site, 34CM102, located in the project area. A follow-up letter from the Oklahoma Archeological Survey, dated October 27, 2015, indicated the requested inspection should be disregarded as 34CM102 is not located within the APE; however, monitoring of cultural resources should be conducted once clearing of ordinances is complete in areas of UXO.

Most of the APEs have been previously surveyed for cultural and historic resources due to prior activities at the Installation. However, portions of the APEs include utility easements that have been disturbed over decades and have not been previously surveyed for the presence of cultural and historic resources.

Consistent with 36 CFR 800.4(a)(2), Fort Sill reviewed existing information in its cultural resources files. No known prehistoric or historic resources, including districts, buildings, structures, objects, and/or sites, were identified within the proposed APEs. The APEs for the firebreaks in the West Range were previously surveyed and no eligible archaeological resources were identified; therefore, no properties eligible for the National Register of Historic Places (NRHP) are located in the APEs of the Proposed Action (Appendix C).

*No Action Alternative:* The No Action Alternative would not include new construction, but instead would continue to maintain existing firebreaks and other fire mitigation measures. Previously-disturbed cultural and historic resources may be present near the existing fire suppression activities but impacts would be minimized under the ICRMP. Therefore, the No Action Alternative would have a negligible effect on cultural and historic resources.

*Proposed Action:* Fort Sill has identified eight affiliated Native American tribes (the Apache Tribe of Oklahoma, the Cheyenne and Arapaho Tribes of Oklahoma, the Delaware Nation, the Caddo Nation, the Wichita and Affiliated Tribes, the Comanche Nation, the Fort Sill Apache Tribe of Oklahoma, and the Kiowa Indian Tribe of Oklahoma) as entities entitled to consultation under Section 106. As such, the tribes will be informed of the Proposed Action and will be invited to participate as consulting parties.

Under the Proposed Action, archaeological surveys would be conducted prior to construction and after UXOs are removed in duded IAs and NDRAs. During firebreak construction on the West Range, cultural resource staff would be present to conduct spot monitoring for archaeological

resources. Considering these planned surveys and lack of prehistoric or historic resources in resource files, less than significant impacts to cultural and historic resources are anticipated under the Proposed Action.

*Detailed Analysis Finding:* Based on the findings above, cultural and historic resources are eliminated from detailed analysis in this EA.

### 3.7 Hazardous Materials and Waste

*Introduction:* Hazardous materials (HM) and hazardous wastes (HW) refer to substances that, because of their quantity, concentration, or physical or chemical, or infectious characteristics, could cause harm to humans, animals, or the environment either by themselves or through interactions with other factors (Institute of Hazardous Materials Management 2015, 1-3). HM can include explosives, compressed gases, flammable liquids, oxidizers and organic peroxides, toxic materials, radioactive material, and corrosive materials (Northeastern University 2015, 1).

Major federal regulations related to HM and HW include:

- Resource Conservation and Recovery Act of 1976 (RCRA);<sup>21</sup>
- Emergency Planning and Community Right-to-Know Act of 1986;<sup>22</sup>
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986;<sup>23</sup>
- Community Environmental Response Facilitation Act of 1992;<sup>24</sup>
- Asbestos Hazard Emergency Response Act;<sup>25</sup>
- Spill Prevention, Control, and Countermeasure Rule;<sup>26</sup>
- EPA Regulation on Identification and Listing of Hazardous Waste;<sup>27</sup>
- EPA Regulation on Standards for the Management of Used Oil;<sup>28</sup>
- EPA Regulation on Designation, Reportable Quantities, and Notification;<sup>29</sup>
- EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*;
- Toxic Substances Control Act of 1976;<sup>30</sup> and
- CAA of 1970, including the 1990 CAA Amendments (Leidos Engineering LLC 2015, 3-48 to 3-54).<sup>31, 32, 33, 34, 35, 36, 37, 38</sup>

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<sup>21</sup> RCRA, 42 USC §§ 6901 et seq.

<sup>22</sup> EPCRA, 42 USC §§ 11001-11050.

<sup>23</sup> CERCLA, 42 USC §§ 9601-9675.

<sup>24</sup> Community Environmental Response Facilitation Act of 1992, 42 USC §§ 9620 et seq.

<sup>25</sup> Asbestos Hazard Emergency Response Act, 15 USC §§ 2651 et seq.

<sup>26</sup> 40 CFR § 112.

<sup>27</sup> 40 CFR § 261.

<sup>28</sup> 40 CFR § 279.

<sup>29</sup> 40 CFR § 302.

<sup>30</sup> Toxic Substances Control Act of 1976, 40 CFR §§ 700–766.

<sup>31</sup> Solid Waste Disposal Act, 42 USC §§ 6901 et seq.

The U.S. Army has established several documents that help present proper procedures for application, use, storage and handling of HM and HW. The applicable Army and/or Fort Sill policies for hazardous material and waste management are further described in:

- *AR 200-1 Environmental Protection and Enhancement*;
- *Hazardous Material and Waste Management Plan (HMWMP)*;
- IPMP, IAW Department of Defense Instruction (DODI) 4150.07 (herein IPMP);
- Pest Management Board Technical Guide No. 15, *Pesticide Spill Prevention and Management* (Technical Guide [TG] No. 15);
- Integrated Training Area Management (ITAM) Five-Year Work Plan, Fiscal Years 2009-2013;
- INRMP; and
- *Final PEA for the Implementation of the US Army IPMP* (HQDA 2007, 34 to 42; USAFCoE 2013, 1-1 to 6-4; Gene Stout and Associates 2013, 14 to 34; Fort Sill 2010, 22; USAEC 2010, 6).

These documents establish regulations that control the generation, storage, use, and disposal of HM and HW at the Installation. The ITAM and HMWMP also summarize the general location and use of HM and storage of HW at the Installation. The TG No. 15 and IPMP also summarize application practices in different Installation areas, spill prevention, and training for employees using pesticides.

Army installations may conduct aerial spraying in range areas contaminated by UXO to control noxious weed growth. The *PEA for the Implementation of U.S. Army Integrated Pest Management Program* provides policy guidance for routine pest management activities, including procedures for handling, containing, and applying pesticides (which include herbicides), including training requirements for individuals applying pesticides (USAEC 2010, 5). These policies have been established to prevent adverse effects to the environment and protect human health. In concurrence with the PEA, the IPMP limits applications of EPA-approved pesticides to prevent cumulative effects (DPW 2014, 89-96). The IPMP does not address aerial spraying on the Installation but would be amended to include aerial application of herbicides as the method of species control after this method is approved under specific NEPA documents.

The HMWMP includes detailed practices for identifying, managing, and disposing of HM and HW (USAFCoE 2013, 2-1 through 4-6). In the same document, training, inspections, and record keeping practices are described for all individuals tasked in dealing with any HM or HW

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<sup>32</sup> 42 USC §§ 116 et seq.

<sup>33</sup> CERCLA, 42 USC §§ 9601-9675.

<sup>34</sup> Asbestos Hazard Emergency Response Act, 15 USC §§ 2651 et seq.

<sup>35</sup> 42 CFR §§ 112 et seq..

<sup>36</sup> 40 CFR §§ 261 et seq.

<sup>37</sup> 40 CFR §§ 279 et seq.

<sup>38</sup> 40 CFR §§ 61 et seq.

(USAFCoE 2013, 5-1 through 5-7). This section also references all appropriate federal, state, and military regulations for working with HM and HW. Another policy outlines the approval process for aerial spraying. An ASSON must be completed by the person requesting an aerial application for noxious weed control (HQDA 2007, 28). This document would then be reviewed and either approved or rejected by EQD at Fort Sill, Fort Sill Pest Management Office, and the Army Environmental Command Entomologist per communication with Ms. Sminkey, NEPA Coordinator for Fort Sill, February 25, 2015.

Once approved and throughout the application process, methods for storing, using, and disposing of the pesticides and any related hazardous materials (fuel, facility maintenance chemicals) follow the HMWMP and AR 200-1 (USAFCoE 2013, 2-1 through 4-6; HQDA 2007, 32-36). These policies ensure HW and HM created at the Installation are inventoried, stored, and disposed of in an approved manner.

Spill prevention for pesticides is guided by the TG No. 15. This guide helps the user prepare for storage, spill prevention, notification requirements, emergency response, reporting, cleanup, and disposal of pesticides (Armed Forces Pest Management Board 2009, 2-11).

The Oklahoma Department of Agriculture, Food and Forestry Consumer Protection's Combined Pesticide Laws and Rules give details on the licensing, certification, and permitting for the use of pesticide along with disposal and record keeping practices (Oklahoma Department of Agriculture, Food and Forestry 2014, 1-88).

*No Action Alternative:* The No Action Alternative would involve the continued application of herbicides to control noxious weeds and honey mesquite, and use of HM and generation of HW by vehicles and equipment used to maintain the existing firebreaks (including fuel and engine fluids). The No Action Alternative would not generate significant new sources of HM that exceed the capacity of the existing HW facilities and would be implemented in compliance with existing policies: HMWMP, AR 200-1, TG No. 15, and IPMP. Therefore, the No Action Alternative would result in a negligible effect on HM and HW.

*Proposed Action:* Under the Proposed Action, aerial spraying would be evaluated on a case-by-case basis under existing policies. The Proposed Action would generate additional HM and HW associated with the vehicles and equipment necessary for firebreak construction and operational maintenance. However, the Proposed Action would not generate significant new sources of HM that exceed the capacity of the existing HW facilities and would be implemented in compliance with existing policies: HMWMP, AR 200-1, TG No. 15, and IPMP. Therefore, a less than significant effect to HM use and management and HW generation and management would result from the Proposed Action.

*Detailed Analysis Finding:* Based on the findings above, HM and HW are eliminated from detailed analysis in this EA.

### 3.8 Health and Safety

*Introduction:* In compliance with the Occupational Safety and Health Act of 1970<sup>39</sup> and ARs, Fort Sill has created requirements for the safety of its employees, civilian contractors, and others on and surrounding the Installation for a variety of activities (EPA 2015c, 1). The applicable U.S. Army and/or Fort Sill policies for health and safety in general and regarding the application of pesticides are further described in:

- AR 385-10 The Army Safety Program (AR 385-10);
- Fort Sill's IPMP;
- TG No. 15; and
- HMWMP (DPW 2014, 10 to 11; Armed Forces Pest Management Board 2009, 4 to 8; HQDA 2013, 1 to 146).

These documents help educate personnel on the health and safety issues pertaining to the application of pesticides at the Installation. AR 385-10 describes procedures and identifies regulatory requirements for handling and responding safely to a HM incident including BMPs and other references (HQDA 2013, 25 to 40). The Installation's IPMP and TG No. 15 include instructions for not only the application of pesticides but also spill response (DPW 2014, 10-13) and preventing health issues concerning a pesticide spill (Armed Forces Pest Management Board 2009, 6-7). In addition to these procedures, the U.S. Army and the Installation have established guidelines in the IPMP for a medical surveillance program for all participants in pesticide application (DPW 2014, 10). The Installation's HMWMP states that the Safety Office would assist the EQD in enforcing safety procedures and standards (Louis Berger Group, Inc. 2013, 1-6).

The *PEA for the Implementation of US Army Integrated Pest Management Program* discusses EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (19885-19888)<sup>40</sup>, which outlines the safety protocol for safe guarding children, including a prohibition on herbicide applications at children's outdoor play areas (USAEC 2010, 27).

Potential fires within the ROI pose a health and safety risk for military personnel and civilians (Section 1.2). This risk has been reduced by current fire mitigation practices (Section 2.2.1). The Installation provides basic community services, including emergency medical, law enforcement, and fire protection within its boundaries. Emergency services provide for the protection of lives and property on the Installation through the Law Enforcement Branch of the Provost Marshal's Office and the Fort Sill Fire Department. The Law Enforcement Branch oversees policing operations, patrols, general and absent without leave investigations, training, and traffic accident and criminal investigations.

The Fort Sill Military Police and Fire Department have mutual aid support agreements with the City of Lawton. The 911 dispatch is co-located with the City of Lawton dispatch, which

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<sup>39</sup> OSHA, 29 USC §651 et seq.

<sup>40</sup> EO 13045, 62 FR 78 (April 21, 1997).

facilitates coordination when incidents cross Fort Sill/Lawton boundaries (Fort Sill 2013, 3-65). If necessary during wildfires, the Fort Sill Fire Department and Installation personnel work with local fire and law enforcement, fire task forces from across southwest Oklahoma, and an Incident Management Team to control fires (News 9 2011, 1). Community services for civilians, including emergency management, police, and emergency medical care, within the ROI are provided by Comanche County, the City of Lawton, Comanche County Memorial Hospital, and the municipalities within their service areas (Comanche County 2015, 1; Comanche County Memorial Hospital 2012, 1-2; City of Lawton Police Department 2012, 1-2; Community Service 2015, 1-2).

The total population of the ROI is 23,069 people based upon the U.S. Census Bureau's 2008 to 2012 ACS. To identify areas with higher concentrations of children within the ROI, a review of Google Earth and the U.S. Census Bureau's 2008 to 2012 *American Community Survey* (ACS) was conducted (Google Earth 2013, 1; EPA 2015d, 1-3; USAFCoE 2015). The research identified the Freedom Elementary School; Fort Sill School Age Center; the Flores Youth Center; the Alice Grierson Child Development Center; the Cooper Child Development Center; and the Tincher Child Development Center within the Installation's Cantonment Area. Due to the high number of parks and residential areas within the Cantonment Area (Section 3.10), concentrations of children in residential and recreational settings are also expected within the Cantonment Area. Due to the transient population, the Cantonment Area does not provide a representative sample of the area for demographic and socioeconomic analysis. Therefore, only the 1,000-ft buffer around the Installation was used as the ROI for demographic analyses for this EA (herein Socioeconomic ROI). Based upon the ACS data, children under 5 years of age represent 10% of the Socioeconomic ROI population, which is slightly higher than state and U.S. percentages (EPA 2016, 1-3). The highest concentrations of children under 5 years of age were located in Census Block Groups (BGs) located in the City of Lawton adjacent to the Installation's southern boundary.

*Detailed Analysis Finding:* Based upon the No Action Alternative's inability to meet the Purpose and Need (Section 1.2) and its lack of additional fire protection, health and safety has been carried forward for detailed analysis in this EA.

### **3.9 Hydrology and Hydrogeology**

#### **3.9.1 Hydrology**

*Introduction:* Surface water hydrology is the study of the origin and processes of waters in streams and lakes and as modified by man (Langbein and Iseri 1995, 3-4). A floodplain is the land adjacent to a body of water which has been or may be covered by flooding, including, but not limited to, the base flood or the flood expected to be equaled or exceeded every 100 years on average (Federal Emergency Management Agency [FEMA] 2015a, 1-7). The base flood is also referred to as the 1% flood event or the 100-year flood.

In 1968, the Oklahoma Water Resources Board (OWRB) was designated as the coordinating state agency for the National Flood Insurance Program (NFIP) in Oklahoma (OWRB 2015a, 1-2). The NFIP is a federal initiative that provides communities with tools to implement sound floodplain management. The Oklahoma Floodplain Management Act, passed in 1980, further

authorizes communities in Oklahoma to develop floodplain regulations and designate flood hazard areas. Both of the regulations apply to areas within the ROI but outside of the Installation.

Under EO 11988, *Floodplain Management*, the U.S. Army is required to avoid, to the extent possible, adverse impacts associated with occupancy and modification of floodplains.<sup>41</sup> Under this EO, federal agencies must:

- Determine if a proposed action is in a base floodplain (1% annual probability of flood occurrence);
- Conduct early public review, including public notice and a brief comment period;
- Identify any practicable alternatives to locating in the base floodplain;
- Identify impacts of a proposed action;
- If impacts cannot be avoided, develop measures to minimize impacts and restore the floodplain, as appropriate;
- Reevaluate alternatives; and
- Present findings and a public explanation before implementing the action (FEMA 2015b, 1-2).

A general overview of the watersheds, streams, and lakes within the ROI is provided in Section 3.5.1. Several floodplains are located within the ROI with the widest floodplain associated with East Cache Creek (Figure 3.9-1).

*No Action Alternative:* The No Action Alternative would not introduce new impervious surfaces or permanently alter existing stream cross sections as low water crossings would be restored to their preexisting contours (Fort Sill 2010, 12 to 13). Repairs to existing firebreaks will maintain drainage between April and November, or as instructed by the Contracting Officer or Contracting Officer's Representative per email communication with Mr. Hill, Installation Pest Management Coordinator for Fort Sill, December 1, 2014. Temporary crossings of streams during construction would be designed to bypass flows during wet weather. The continued removal of vegetation would prevent some percolation of surface water into the soil as the removal of forest vegetation increases the velocity of surface runoff (Ansari 2003, 1-7). This effect on surface water runoff velocities is expected to be minimal. Consequently, the No Action Alternative would result in a less than significant impact on Hydrology.

*Proposed Action:* The Proposed Action would cross base floodplains in multiple locations (Figure 3.9-1). FBWR56 would cross 2.0 miles of base floodplains, and WVRAs would occur over 11.03 acres (area) or 1.98 miles (linear feet of stream in the floodplain) (Figure 3.9-2). The Proposed Action would not introduce new impervious area or permanently alter stream cross sections as all low water crossings would be restored to preexisting contours (Fort Sill 2010, 12 to 13).

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<sup>41</sup> EO 11988, 3 CFR, 1977 Comp., p. 117.

Repairs to existing firebreaks will maintain drainage between April and November or as instructed by the Contracting Officer or Contracting Officer's Representative per email communication with Mr. Hill, Installation Pest Management Coordinator for Fort Sill, December 1, 2014. Temporary crossings of streams during construction would be designed to bypass flows during wet weather. The removal of vegetation from proposed firebreaks and WVRAs would prevent some percolation of water into the soil and increase runoff velocity.

However, the Proposed Action would create additional storage within the floodplain due to the removal of vegetation which is expected to offset these minor increases in surface runoff velocity associated with vegetation removal. Slight changes in nutrient loading would occur as a result of removal of vegetation near riparian corridors. Aerial spraying would not affect hydrology. Based upon this analysis, the Proposed Action would result in a less than significant effect on hydrology, including base floodplains.

Based upon an earlier wildfire probability analysis (Sections 2.2.2 and 2.3), the Proposed Action represents the most practicable alternative for fire mitigation. Contractors would inspect, maintain, and repair all firebreaks, while maintaining the drainage between April and November or as instructed by the Contracting Officer or Contracting Officer's Representative per email communication with Mr. Hill, Installation Pest Management Coordinator for Fort Sill, December 1, 2014. The anticipated components would have less than significant effects on drainage and the stream beds or major conduits for floodplains would be restored to preexisting contours after construction. Based on this analysis and incorporating the floodplain considerations into the public notice, the Installation would meet its responsibilities under EO 11988.

*Detailed Analysis Finding:* Based on the findings above, hydrology is eliminated from detailed analysis in this EA.

### **3.9.2 Hydrogeology**

*Introduction:* Portions of the Installation are located over the Arbuckle Timbered Hills, a major bedrock aquifer (OWRB 2015b, 1). Figure 3.9-3 displays the aquifers at the Installation. No data on aquifers or delineated boundaries were available for portions of the ROI including the West Range. The Arbuckle-Timbered Hills Aquifer is designated as a major, bedrock aquifer by the OWRB, but little is known about the water-bearing properties (Christenson, et al. 2011, 12). Limestone, the primary rock type, and dolostone (or dolomite), the secondary rock type, are common (Heran, Green and Stoeser 2003, 1). Four minor aquifers are present on the Installation. Beaver Creek and Cache Creek are alluvial aquifers, while Hennessey-Garber and Post Oak are bedrock aquifers (OWRB 2015c, 1). The bedrock of the minor aquifers consists of limestone and sandstone (Belden, Sullivan and Wilkins 1996, 1-7). The alluvial material of the Beaver Creek and Cache Creek minor aquifers typically consists of clay, silt, sand, and gravel.

The EPA has designated the eastern portion of the Arbuckle-Simpson Aquifer, located 54 miles east of the Installation, as a sole source aquifer (EPA 2015e, 1-3; OWRB 2003, 1-4). A sole source aquifer supplies at least 50% of the drinking water consumed in the area overlying the aquifer. The primary use of the Arbuckle-Simpson Aquifer is drinking water, while the Arbuckle-Timbered Hills Aquifer is typically used for domestic purpose and irrigation (Horak

and Stoner 1987, 2-3). Water from the Arbuckle-Timbered Hills Aquifer is typically unsuitable for public water supply due to large concentrations of chloride and fluoride.

The Beaver and Cash Creek Minor Aquifers are primarily used to supply water for irrigation, but some rural, smaller communities also rely upon these aquifers for drinking water (Belden, Sullivan and Wilkins 1996, 11-21). Both the Cache Creek and Beaver Creek Minor Aquifers exhibit elevated levels of nitrate, fluoride, and total dissolved solids (TDS). The quality of groundwater varies in these aquifers due to their alluvial structure, shallow depth, and more rapid infiltration of surface water than typically occurs through deeper bedrock aquifers.

The Post Oak Minor Aquifer typically provides water for domestic and stock water use. The Hennessey-Garber Minor Aquifer is also used for these purposes as well as public water supply. The Post Oak and Hennessey-Garber Minor Aquifers also exhibit high levels of fluoride and TDS.

*No Action Alternative:* The No Action Alternative would not remove soil and bedrock, but may result in temporary compression of soils by heavy equipment during maintenance activities. It would continue to remove vegetation which would, in turn, continue to slightly increase runoff and decrease infiltration in these areas. However, it would not substantially alter hydrology and recharge to aquifers (Section 3.9.1). Consequently, the No Action Alternative would have a less than significant effect on hydrogeology.

*Proposed Action:* After completion of construction and maintenance activities, streams would be restored. Additional vegetation removal resulting from the Proposed Action would slightly increase runoff and decrease infiltration. It is not anticipated to alter hydrogeology to the extent that surface water recharge to alluvial aquifers is substantially altered. Therefore, the Proposed Action would have a less than significant effect on hydrogeology.

*Detailed Analysis Finding:* Based on the findings above, hydrogeology is eliminated from detailed analysis in this EA.

### **3.10 Land Cover and Land Use**

#### **3.10.1 Land Cover**

*Introduction:* Land cover is the physical material at the surface of the land, such as vegetation or man-made structures. Impacts result from the change in land cover which, when combined with new development may increase impervious area or area of surfaces which prevent or limit infiltration of fluids and may include concrete or asphalt (U.S. Legal 2015, 1). The land cover within the ROI is depicted in Figure 3.10-1, and is divided between developed areas classified by use type: barren land, vegetative communities, and agricultural uses including hay/pasture and cultivated crops (Figure 3.10-1; U.S. Geological Survey [USGS] 2011[GIS]). In addition to these land covers, the Installation also allows agricultural leases to control fire fuel (Section 3-13). The locations of these agricultural leases vary.

*No Action Alternative:* Herbicide applications and prescribed burns would remove fire fuel and reduce woody vegetation, but would not convert undeveloped land to developed land or

introduce impervious surfaces. Therefore, the No Action Alternative would have a negligible effect on land cover.

*Proposed Action:* The Proposed Action would reduce herbaceous cover temporarily for construction access and permanently for maintenance of firebreaks and WVRAs (Section 3.4), but would not result in new development or an increase in impervious cover (other effects on water resources are described in Sections 3.5.1 and 3.17). The Proposed Action would result in minor changes in land cover. Therefore, the Proposed Action would have a less than significant effect on Land Cover.

*Detailed Analysis Finding:* Based on the findings above, land cover is eliminated from detailed analysis in this EA.

### **3.10.2 Land Use**

*Introduction:* Land use denotes how humans use the biophysical or ecological properties of land (Ellis 2010). Land use impacts typically result from the conversion of undeveloped areas to developed areas, incompatible land uses, agricultural land encroachment, urban sprawl, and conflicts with land use plans, policies, and controls. Land use incompatibility (or adjacent incompatible land uses) can cause unreasonable interference by one party of another party's enjoyment of his or her property (West Virginia University 2015, 1-5). Interference might include air or noise pollution and erosion. The EPA defines urban sprawl as low-density, automotive dependent development which occurs beyond the edge of services and major employment areas (Policy Almanac 2003, 1).

Within the Installation, the Cantonment Area includes a variety of land uses including residential, park, and industrial (Figure 1.1-2). Outside of the Cantonment Area, the Installation is divided into ranges used primarily for military operations. The land uses outside of the Installation and within the ROI include rural areas, road ROW, wildlife preserves, and residential and commercial areas (U.S. Department of Agriculture [USDA] National Aerial Imagery Program (NAIP), 2014 [GIS]). The Wichita Mountains NWR is located to the northwest of the Installation and the James A. Manning State Fish Hatchery is located in Medicine Park (Section 3.4.5). No Comanche County or municipal parks are located directly adjacent to the Installation per communication with Mr. John Wermey, Comanche County Assessor's Office, August 17, 2015. The City of Elgin's Osborne Park is located within the ROI, across NE Keeney Road from the northeast corner of the Installation. The City of Lawton's Garden Village Park, Gooch Acres Park, Terrace Hills Park, Albert Johnson Park, and Military Park, are located directly across the street from the southern boundary of the Installation (City of Lawton 2016). Agricultural leases occur within the Installation and other farmlands are present within the ROI (Section 3.13).

*No Action Alternative:* Under the No Action Alternative, new development, incompatible land use, agricultural land encroachment, and conflict with land use plans, policies, and controls would be negligible. Wildfire risks would not be reduced beyond current practices (Section 3.8). Only temporary, minor effects on air quality (Section 3.3), noise (Section 3.11), farmland (Section 3.13), transportation (Section 3.14), and water resources (Sections 3.5.1, 3.17, and 4.3.1) are anticipated. Therefore, a negligible effect on land use would occur under the No Action Alternative.

*Proposed Action:* The construction of firebreaks as part of the Proposed Action would occur in largely-undeveloped military operation areas outside of IAs, NDRAs, and Small Arms Ranges (Section 2.2.2). WVRAs would be constructed primarily at the edges of the Installation. The construction areas include the northern Installation boundary by Apache Gate, adjacent to the Wichita Mountains NWR, along the eastern boundary of the Installation, and the southern boundary of the East and West Ranges (Figures A-1 to A-3, A-5, A-7 to A-12, and A-13 to A-22, respectively). Interior WVRAs would be constructed within the east and west ranges of the Installation (Figures A-4 and A-6).

Based upon a review of aerial photography (USDA NAIP, 2014 [GIS]), WVRAs that would be most closely constructed near developed areas (less than 500 ft) include:

- Map Index 5 (Figure A-5) south of State Highway 49;
- Map Index 7 (Figure A-7) south of East Boundary Road and west of NE Keeney Road;
- Map Index 8 (Figure A-7) west of NE Keeney Road and perpendicular to Pond Drive and NE Miller Rd;
- Map Indices 15 and 16, (Figure A-8) north of U.S. Highway 62; and
- Map Index 17 east of Interstate 44, parallel and north of NE Fullerton Street on its western extent and perpendicular Adams Hill Road on its eastern extent (Figure A-9).

Developed areas outside of the Installation are typically buffered from the proposed WVRAs by a road approximately 40 ft wide with vegetative buffer strips. The construction width of the WVRAs would range from 15 to 800 ft (Appendix A). Most of the wider WVRAs would be constructed inside the Installation and away from residential areas with the exception of WVRAs near Adams Hill Road and Parks Hill Road (Map Indices 20 and 21, Figures A-20 and A-21).

The programmatic application of herbicides using aerial spraying would employ BMPs to protect air quality (Section 3.3), health and safety (Section 3.8), farmland (Section 3.13), and water resources (Sections 3.5.1, 3.17, and 3.2).

The resulting firebreaks and WVRAs would not result in incompatible, permanent land use impacts or effects. Temporary and localized effects on air quality (Section 3.3) and noise (Section 3.11) would occur during construction and maintenance. The Proposed Action does not conflict with the land use plans of Medicine Park and Lawton per communication with Mr. Raymond Reynolds, Public Works Representative for Medicine Park, August 12, 2015 and Mr. Richard Rogalski, Lawton Planning Director, on August 13, 2015. No land would be developed under the Proposed Action. The Proposed Action would not contribute to urban sprawl and secondary or induced growth, as it would occur largely within the Installation and would not provide infrastructure or other stimulus for development.

FBER68 will be constructed adjacent to an agricultural field, but will not disturb the field. No agricultural lands inside or outside the Installation would be directly converted to other uses (Section 3.13).

The Proposed Action would reduce the probability of a wildfire leaving the Installation which would provide greater fire protection for existing developed properties both on and off the Installation. Consequently, the impacts on land use associated with the Proposed Action are considered to be beneficial and less than significant.

*Detailed Analysis Finding:* Based on the above findings, land use is eliminated from detailed analysis in this EA.

### 3.11 Noise

*Introduction:* Noise is defined as "unwanted or disturbing sound," which interferes with normal activities (EPA 2012a, 1 to 4). Sound is measured in decibels (dB) or units of sound pressure. The measure of human response to sound is calculated as an A-weighted decibel (dBA) and used to characterize the compatibility of noise levels with different settings:

- 50 dBA reflect a relatively quiet environment like a suburban setting;
- Less than 62 dBA is normally acceptable for indoor and outdoor environments;
- Between 62 and 74 dBA is normally acceptable for sleeping quarters and active, outdoor recreation; and
- 70 dBA is typically consistent with an urban environment (Kelso and Perez 1983, 1 to 10; EPA 1971, 15 to 23).

Studies suggest that some wildlife experience disruption of normal behavior (health, reproduction, and survival) at exposure to 46 dBA (Federal Highway Administration [FHWA] 2004, 1 to 75). Noise sensitivities ranges from -20 dB (mammals) and range up to 60 dB (reptiles).

The federal government, including the military, uses Yearly Day-Night Average Sound Level (DNL) as its primary measure for noise impacts on people and land uses. This represents the cumulative noise exposure of individuals and incorporates a 10 dB penalty for night-time levels (2200 to 0700 hours or 10:00 p.m. to 7:00 a.m.) (HQDA 2007, 43-45). Under AR 200-1, the military is required to prevent noise levels that adversely affect sensitive receptors (including housing, schools, medical facilities, shelter for domestic animals, and wildlife habitat) (HQDA 2007, 43-45). This policy establishes a goal of noise levels at or below 60 to 65 DNL for sensitive receptors.

In general, sound levels generated by stationary sources reduce by 6 dB for each doubling of distance from the source (Simon Frasier University 2015, 1-6). Sound levels generated by line sources (e.g., cars or planes) are reduced by 3 dB for each doubling of distance. Multiple sources of sound can have a synergistic (or additive) effect on noise levels.

Fort Sill's major noise sources include vehicles, training ranges, and two airfields (on and off the Installation). Prior studies suggest that noise levels from most activities at the Installation are typically compatible with sensitive receptors and do not extend off the Installation (USACE Mobile District 2006, 4-13 to 4-21; Gene Stout and Associates 2013, 6, 3-13 to 3-21). However, noise from large caliber weapons and aviation, which originates on the Installation, does affect

the northern portion of Lawton; portions of the western and eastern Cantonment Area; and agricultural and forest land outside of the Installation but within the ROI.

*No Action Alternative:* Although this alternative's components would involve temporary noises, these impacts are currently ongoing. Noise levels would involve continuation of existing activities. Therefore, a negligible impact on noise is anticipated from existing conditions under the No Action Alternative.

*Proposed Action:* Implementation of this alternative would introduce new stationary (or point) and line sources of noise. Typical construction and clearing activities, involving heavy equipment, generate noise levels between 73 to 96 dBA at 50 ft from the sound's origin (EPA 1971, 10 to 12). The use of chainsaws and mechanical saws for woody vegetation removal can generate 46 dBA and between 73 and 82 dBA, respectively (FHWA 2004, 24). Construction noise over 65 dB typically extends 400 to 800 ft from its source and dissipates to less than 65 dB over 1,000 ft from the construction (USACE Mobile District 2006, 4-15).

The new firebreaks under the Proposed Action would occur within undeveloped areas on the Installation located away from sensitive receptors with the exception of FBWR56, which is located at its closest point approximately 50 ft south of James A. Manning State Fish Hatchery. Differences in topography, including hills between the FBWR56 and James A Manning State Fish Hatchery, would dampen sound effects. The WVRAs are located near or within 40 ft of sensitive receptors in Lawton, Elgin, unincorporated Comanche County, and Wichita Mountain NWR (Figures A-2, A-4, A-8, and A-9; USDA 2014 [Aerial Photograph – GIS]).

Sensitive receptors in proximity to FBWR56 and the WVRAs would experience temporary increases in noise levels above 65 dB. These levels would be minimized to the extent practicable by the following BMPs:

- Construction would occur during normal weekday business hours (0730 to 1600 or 7:30 a.m. to 4:00 p.m.) in areas adjacent to sensitive receptors and any off-Installation areas;
- Construction equipment mufflers would be maintained to the manufacturer's standards; and
- Construction, where possible, would avoid breeding seasons of the BCVI.

Aerial spraying would be conducted by a rotary-wing (helicopter) aircraft; fixed-wing (piston-powered) aircrafts may also be utilized if necessary (Boving and Winterfield 1972, 1). These smaller, piston-powered general aviation operations produce:

- A 60 DNL contour within less than a 1.1 square mile area and no more than 12,500 ft from the take-off area; or
- A maximum DNL 65 dB control of 0.5 square mile and not more than 10,000 ft from the start of takeoff (FAA 2007, 5).

Helicopters typically generate a 60 dB contour within 0.10 square mile and not more than 1,000 ft from the helicopter pad. Aerial spraying could occur anywhere within the Installation,

but flights would originate from an existing air facility. Noise impacts associated with take-off and landing would have a negligible effect on existing aviation noise contours due to the minimal number of anticipated flights. Temporary increases in noise levels would occur during the aerial spraying. Implementation of the aforementioned BMPs would result in a less than significant impact on noise under the Proposed Action.

*Detailed Analysis Finding:* Based on the above findings, noise is eliminated from detailed analysis in this EA.

### **3.12 Socioeconomics and Environmental Justice**

#### **3.12.1 Socioeconomics**

*Introduction:* Socioeconomics considers local population, community services, and economics. The approximate population of the Socioeconomic ROI is 5,759 people based upon the U.S. Census Bureau's 2008 to 2012 ACS. There are 2,485 housing units and 2,256 households within the ROI (Appendix D). ACS data from 2008 to 2012 indicates that 12.5% of the housing units in Comanche County are vacant and nearly 5% are available for rent or sale (World Media Group, LLC 2015, 1 to 2). According to the ACS population estimates for 2008 to 2012, the majority of the population consists of adults between 18 and 65 years of age (61% of the total population). The remaining population consists of younger and older individuals (10% between 0 and 4, 19% between 0 and 17, and over 10% over 65 years of age). The per capita income within the Socioeconomic ROI is \$23,092 (Appendix D).

The Installation provides education within its boundaries. Community services for civilians, such as emergency management, police, and emergency medical care within the ROI are provided by Comanche County, the City of Lawton, Comanche County Memorial Hospital, and the municipalities within their service areas (Comanche County 2015a, 1; Comanche County Memorial Hospital 2012, 1-2; City of Lawton Police Department 2012, 1-2; Community Service 2015, 1-2).

*No Action Alternative:* The No Action Alternative would continue existing fire mitigation efforts through a combination of military personnel and contractors. It would have a negligible effect on population, including immigration, employment, and income, because it would continue existing patterns of employment. Increased demand for education would be negligible under the No Action Alternative as negligible changes in population are expected. The No Action Alternative would continue to provide some fire protection benefits for the area and support community fire protection. Therefore, the No Action Alternative is expected to have a less than significant effect on Socioeconomics.

*Proposed Action:* Construction and programmatic aerial spraying under the Proposed Action would require additional military personnel or civilian contractors for completion. Temporary increases in population and temporary housing needs would occur but are not expected to induce permanent changes in population, including immigration, employment, or income, because construction, maintenance, and the programmatic aerial spraying would be periodic rather than ongoing. The construction of firebreaks and WVRAs would not bisect existing communities or require relocation of residents.

Construction and maintenance of the Proposed Action would result in a temporary increase in expenditures and potential hiring that could modestly improve the local tax base. Temporary needs for housing may occur but are not expected to exceed existing supply. Increased demand for education, medical, and other community services, excluding fire protection, would be negligible under the Proposed Action as negligible changes in population are expected. The Proposed Action would reduce the probability of wildfires and improve fire protection within the ROI. Therefore, the Proposed Action is expected to have a beneficial effect on socioeconomics.

*Detailed Analysis Finding:* Based on the above findings, socioeconomics is eliminated from detailed analysis in this EA.

### **3.12.2 Environmental Justice**

*Introduction:* Environmental Justice (EJ) is defined as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies" (EPA 2015f, 1). Fair treatment means that no group of people should burden a disproportionate share of negative environmental consequences from an action (EPA 2012b, 1). Meaningful treatment means that people have an opportunity to participate in agency decisions; the public's comments can influence the regulatory agency's decision; concerns are considered in the decision-making process; and that decisions would encourage involvement from potentially affected individuals (EPA 2012b, 1).

EO 12898 requires each federal agency, to the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance review, make achieving EJ part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effect of its programs, policies, and activities on minority populations and low-income populations.<sup>42</sup>

To conduct a screening analysis of minority and low-income populations, organizations can use the Environmental Justice Mapping and Screening Tool (EJSCREEN), a web-based application, provided by the EPA, which is based upon a nationally-consistent dataset and provides environmental and demographic indicators (EPA 2015d, 1-123; EPA 2015g, 1-47). EJSCREEN exhibits higher levels of uncertainty when analyzing small areas, such as a Census BG, as weighting factors are applied to estimate populations within portions of the Census BGs. Also, EJSCREEN's screening-level indicators for health impacts provide general proxies for a community's health status and potential susceptibility to pollution, rather than detailed risk assessment (EPA 2015h, 1-3).

EJSCREEN's analysis is based upon most recent U.S. Census Bureau ACS (U.S. Census Bureau 2012, 1-3; EPA 2015d, 1-27). The following definitions are used by EJSCREEN. Minority populations are the number or percent of individuals in a Census BG who list:

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<sup>42</sup> EO 12898, 59 FR 7629 (Feb. 16, 1994).

- Racial status as a race other than white alone (single race); and/or
- Ethnicity as Hispanic or Latino.

Low-income represents the number or percent of a Census BG's population in households where the household income is less than or equal to twice the federal poverty level. Linguistic isolation is defined as the number or percent of people in a BG living in linguistically-isolated households or living in a household in which all members age 14 years and over have difficulty speaking English. Less than high school education demonstrates the number or percent of people age 25 years or older in a Census BG without a high school diploma (EPA 2015d, 20).

For a location to be considered a potential EJ AOC, the minority population and poverty percentage within the Socioeconomic ROI must be "meaningfully greater" than that of the larger geography. EJSCREEN was queried to evaluate the Socioeconomic ROI within the greater geography of the State of Oklahoma, EPA Region 6, and the U.S. (Table 3.12-1). Each larger geographic area was represented as both an average and percentile, which compares the Socioeconomic ROI with the larger area (e.g., an 80% percentile indicates that only 20% of the population exhibits a higher number or percentage of a characteristic).

Table 3.12-1 indicates that both the minority and low-income populations within the Socioeconomic ROI are meaningfully greater than the larger geographies. The Socioeconomic ROI's minority population was higher than the Oklahoma average, lower than the EPA Region 6 average, and higher than the U.S. average. Based upon percentiles, the Socioeconomic ROI's minority population is higher than most communities in Oklahoma (85 percentile), and the U.S. (69 percentile). An exception is EPA Region 6 where the Socioeconomic ROI is the 55 percentile, which indicates that the community is similar to roughly half of Region 6. Seven Census BGs within the Socioeconomic ROI demonstrated higher densities of minorities when compared to the U.S., Oklahoma, and surrounding areas outside the Socioeconomic ROI in Comanche County. These meaningfully greater minority populations were established based upon natural breaks in the demographic data and represented densities of 49% to 66%. The BGs are located within the City of Lawton, including Census BGs located adjacent to the Installation, south of the Cantonment Area, and east of Interstate 44 (Figure 3.12-1; EPA 2015b, 3). Consequently, the meaningfully greater minority populations were further evaluated for a disparate impact.

An evaluation of the low-income population indicates that the Socioeconomic ROI's low-income population is typically higher by percentile than larger geographies. Based upon the data for the larger geographies, a low-income population within the Socioeconomic ROI would be considered meaningfully greater if the population's low-income population exceeded 42%. An evaluation of the Socioeconomic ROI data indicated that no Socioeconomic ROI Census BGs met or exceeded this criteria or represent BGs with a meaningfully greater population (EPA 2015b, 4). The Socioeconomic ROI's linguistically isolated population represents a high percentile (83%) compared to Oklahoma and the U.S. (65%) but is less unique than EPA Region 6 (57%). The educational attainment (high school education) of the Socioeconomic ROI is typically higher than the other geographies based upon percentile. Consequently, these populations were not evaluated for a disparate impact.

*No Action Alternative:* Under the No Action Alternative, the minority populations within the ROI would bear continued risk of wildfires and temporary, less than significant effects on air quality (Section 3.3), health and safety (Section 3.8), noise (Section 3.11), and transportation (Section 3.14). Therefore, the minority communities would incur a less than significant EJ effect.

*Proposed Action:* Under the Proposed Action, WVRAs would be constructed across the street from and within 1 mile of several residential areas with minority populations north of Lawton and near Interstate 44 (Map Indices 16 to 20, Figures A-16 to A-20). Under the Proposed Action, minority communities within the Socioeconomic ROI would endure a continued risk of wildfires as would the other communities in the Socioeconomic ROI. These minority communities would also incur temporary, less than significant effects on air quality (Section 3.3), health and safety (Section 3.8), noise (Section 3.11), and transportation (Section 3.14). Similar effects would occur in residential areas with lower minority populations. Minority populations would not incur a disparate impact compared to other communities. Therefore, EJ would incur a less than significant effect under the Proposed Action.

*Detailed Analysis Finding:* Based on the above findings, EJ is excluded from detailed analysis in this EA.

### **3.13 Soils and Topography**

#### **3.13.1 Soils**

*Introduction:* The term "soils" refers to unconsolidated materials formed from the underlying bedrock or other parent material. Soils play a critical role in both the natural and human environment. The soils within the Installation are presented in Figure 3.13-1. Combinations of rock outcrop and brico soils, such as Rock outcrop-Brico complex, 3% to 20% slopes, are common throughout the Installation. The majority of soils are made up of the Foard, Zaneis, Ashport, and Vernon soil series (Natural Resources Conservation Service [NRCS] 2015). Soil data are unavailable in four regions (Quanah Range, West Range, North Arbuckle in the East Range, and the South Arbuckle in the East Range) due to land use constraints and potential UXO (Figure 3.13-1). The NRCS National Hydric Soils List for 2014 identifies two hydric soils in Comanche County that are present at the Installation: Konawa loamy fine sand with 1% to 3 % slopes and Konawa loamy fine sand with 3% to 5% slopes (NRCS 2014, 1 to 2). Combined, these two soils contribute approximately 380 acres to the south of the Quanah Range.

Soil erosion can occur when soils become exposed through both natural and man-made occurrences such as vehicles, wildfires, and mechanical vegetation removal. As outlined in the INRMP, the Installation implements soil erosion control and restoration policies to minimize soil erosion. Soil erosion is common in training areas where soil becomes exposed from the movement of tracked and wheeled vehicles. To combat erosion, these exposed areas are smoothed and seeded before and, if necessary, after they become eroded. A geotextile base and gravel surfaces designed to prevent soil erosion were constructed in some areas (Gene Stout and Associates 2013, 137 to 138).

Wildfires rapidly remove ground cover, leaving soils exposed and highly susceptible to erosion. Emergency restorative processes, such as replanting, are required when wildfires occur. The Installation uses a network of firebreaks, agricultural lease areas, noxious weed removal, and prescribed burns as methods of wildfire prevention and suppression. While removing fire fuel reduces the potential of wildfire occurrence, it also increases exposed soils and potential erosion. To minimize this during firebreak construction and maintenance, the DPW implemented soil erosion and restoration procedures in the INRMP that include assigning priorities to certain firebreak areas and adjusting the timing of construction and maintenance. Installation boundaries, the Ammunition Storage Point, and powder burning areas have high priorities for firebreak maintenance. Due to prevailing wind directions and its influence on wildfire movement, northern boundaries have warm season priority, and southern boundaries have cold weather priority (Gene Stout and Associates 2013, 53 to 54). Bare areas resulting from the removal of honey mesquite are reseeded with native grasses (Gene Stout and Associates 2013, 138). Most of the area on the Installation that is leased for agricultural use is native grass. Farmers are restricted on the amount of times they can harvest hay and must not cut any area shorter than 4 inches from the ground (Gene Stout and Associates 2013, 109). Additional leased agricultural areas are used for crop production and do not have the same harvesting regulations.

*No Action Alternative:* The No Action Alternative would involve the continued removal of noxious weeds in compliance with federal and state laws and Installation-specific BMPs, such as reseeded with native grasses. Current woody vegetation removal and firebreak maintenance would continue following erosion and restoration procedures established in the INRMP. Wildfire risks would continue to exist, creating potential for adverse effects on soils, such as exposure of soil to erosion and compression from emergency response vehicles. Because these potential effects generally could be minimized through replanting and emergency stabilization measures, the No Action Alternative would result in less than significant impacts to soils.

*Proposed Action:* Under the Proposed Action, short- and long-term direct effects on soils would be expected due to firebreak and WVRA construction. Short-term, direct soil compaction and disturbances are anticipated from vehicle traffic, foot traffic, and large equipment such as mulching and grinding equipment. During tree removal in WVRAs, the stump and root system would remain to avoid exposure of soil to erosion. Tree stumps and root systems would be removed during firebreak construction, leaving the area susceptible to erosion. Firebreak construction and maintenance would be coordinated with the Fort Sill Fire Department, Range Control, and DPW in compliance with the existing Firebreak/Fuel Removal SOP and Maintenance SOP. Long-term maintenance efforts could result in additional soil disturbances from vehicles, foot traffic, and equipment. However, the majority of effects would occur during construction. Soils would not be converted and no fill would be used during construction or maintenance activities. Therefore, a less than significant impact to soils is anticipated.

*Detailed Analysis Finding:* Based on the findings above, soils are eliminated from detailed analysis in this EA.

### **3.13.2 Topography**

*Introduction:* Topography is the arrangement of natural and artificial physical features of an area. The topography of the Installation is classified as Central Rolling Red Prairies Land

Resource Area. The land on the Installation is characterized as follows: 51% of the land area is level or gently sloping, 20% of the land area is rolling hills or undulations (with slopes between 3% and 5%), and 29% of the land area has slopes greater than 5%. The maximum elevation is approximately 2,200 ft at the summit of Mount Sheridan, and the minimum elevation is approximately 1,080 ft at the point where East Cache Creek leaves the Installation (USACE 2006, 4-21 to 4-23).

*No Action Alternative:* Wildfire risks would continue to exist, which creates potential for adverse direct effects on soils, such as exposure of soil to erosion that could result in pits and gullies, as well as mass vegetation removal. Because these potential effects could be minimized through replanting and emergency stabilization measures as described in the INRMP, the No Action Alternative would result in less than significant, direct and indirect impacts to topography.

*Proposed Action:* Firebreak construction and maintenance would be coordinated with the Fort Sill Fire Department, Range Control, and DPW in compliance with the Firebreak/Fuel Removal SOP and Maintenance SOP. No grading or change in slope is anticipated from construction or maintenance of the Proposed Action. While these activities involve direct vegetation removal during construction and maintenance, the potential for mass vegetation removal that could occur from potential wildfires would be decreased. Some minor drainage alteration would occur during construction, but it is anticipated that this would be offset by additional storage within the floodplain (Section 3.9.1). Implementation of the Proposed Action would result in no change in slope and minor impacts to vegetation and drainage. Therefore, it would have a less than significant impact on topography.

*Detailed Analysis Finding:* Based on the findings above, topography is eliminated from detailed analysis in this EA.

### **3.13.3 Prime Farmland**

*Introduction:* Prime farmland soils are protected under the Farmland Protection Policy Act (FPPA) of 1981. The intent of this Act is to minimize the extent to which federal programs contribute to the unnecessary or irreversible conversion of farmland soils to non-agricultural uses. The FPPA also ensures that federal programs are administered in a manner that, to the extent practicable, would be compatible with private, state, and local government programs and policies to protect farmland. The NRCS is responsible for overseeing compliance with the FPPA and has developed rules and regulations for implementation of this Act (NRCS 2013, 3 to 4).

No farmlands in Comanche County are classified as unique, however there are nine soil series classified as prime farmland (NRCS 2015, 12 to 84). Prime farmland soils within the Installation cover approximately 25,066 acres of the 93,677-acre ROI, or about 38% (Figure 3.13-2). Major areas of Lawton loam (1% to 5% slope) on the Installation are adjacent to East Cache and Medicine Creeks on the higher slopes. Major areas of the Zaneis series surround the North Arbuckle area (Figure 3.13-1).

The Installation contains approximately 5,000 acres of leased farmland, which is native grass, hay, and other crops such as alfalfa. The NRCS considers surrounding land uses and

infrastructure when evaluating impacts to farmlands that require a 1-mile radius review of urban areas around projects (NRCS 2013). In compliance with the *FPPA Manual*, additional ROIs which include a 1-mile radius buffer around each of the three components of the Proposed Action were used to evaluate the urban areas around each component (Figure 3.13-3). Although areas where mechanical removal or ground-level spraying is impracticable due to UXO and severe undergrowth would be targeted for aerial spraying, the entire Installation is being evaluated for impacts from aerial spraying. Therefore, a 1-mile buffer was applied to the entire Installation as an aerial spraying ROI for prime farmland. Approximately 83% of the land within the aerial spraying ROI and greater than 90% of the land within the proposed firebreaks ROI and the proposed WVRA ROI are in non-urban use (Fort Sill 2014 [GIS], U.S. Census Bureau 2010 [GIS]). These combined ROIs establish the Prime Farmland ROI.

*No Action Alternative:* The No Action Alternative would involve continued aerial spraying to control honey mesquite and application of approved herbicides to control noxious weeds in compliance with federal and state laws and Installation-specific BMPs, such as only spraying for weeds when winds are below 5 miles per hour (DPW 2014, 8 to 88). Wildfire risks would continue to exist, which create potential for adverse effects on prime farmland, such as exposure of soil to erosion. Because these potential effects could be minimized through emergency stabilization measures, such as smoothing and seeding, the No Action Alternative would result in a less than significant impact to prime farmland.

*Proposed Action:* The Proposed Action includes areas of prime farmland and/or agricultural leases controlled by the Installation, but these areas would not be directly affected. While woody vegetation would be cleared along perimeters of these lease areas, the fields will not be disturbed. Due to the conditions required for aerial spraying to be considered, it is unlikely the areas would be suitable farmlands. NRCS was provided information on the Proposed Action for impact analysis via NRCS Form AD-1006 (Appendix E). Site assessment points were assigned to 12 site assessment criteria for each of the three components of the Proposed Action: aerial spraying, proposed firebreaks, and WVRA. Out of a possible 160 points, the components of the Proposed Action were assigned a total of 22, 35, and 25 points, respectively, for the site assessment criteria. The majority of points were awarded due to percentage of urban area versus non-urban area in the Prime Farmland ROI. A letter was sent to the NRCS requesting agency review on October 6, 2015. As of the date of this publication, a response has not been received from NRCS.

Implementation of the Proposed Action would create no direct impacts on the lease areas. Aerial spraying of honey mesquite already occurs as part of the No Action Alternative. The same SOPs and BMPs used for aerial spraying under the No Action Alternative would be implemented for additional aerial spraying under the Proposed Action. The effects of additional aerial spraying would be temporary and would not convert soils to non-agricultural uses. Minor soil disturbances adjacent to fields are anticipated during the proposed firebreak and WVRA construction and maintenance; however, no discing or other disturbance of the fields is expected. Because minor, temporary impacts to prime farmland are anticipated, the Proposed Action would result in less than significant, direct and indirect impacts, to prime farmland.

*Detailed Analysis Finding:* Based on the findings above, prime farmland is eliminated from further analysis in the EA.

### 3.14 Transportation

*Introduction:* Level of Service (LOS) is a qualitative measure that describes operational conditions within a traffic stream of roads, including speed and travel time, freedom to maneuver, traffic interruptions, comforts, convenience, and safety (Anderson 2000, 92). Improvements in transportation are typically expressed as an increase in LOS, and adverse effects, such as decreases in travel time, are typically represent a decrease in LOS. The ROI was used for transportation, as it considers the roadways connected to the main entrances and egresses of the Installation.

Major roads in the ROI include State Highway 115, which travels from Cache north to bisect the western portion of the Installation to the west of Camp Eagle (Figure 1.1-2) to the Wichita Mountains NWR; U.S. Highway 62, which parallels the Installation's southern boundary and merges with Interstate 44; Interstate 44 (or H.E. Baily Turnpike), which bisects the Installation through the eastern portion of the Cantonment Area before heading northeast to Elgin; State Highway 49, which parallels the northern boundary of the Installation; and U.S. Highways 281 and 277, which also travel northeast from Interstate 44 to Elgin (Figure 1.2-2). A network of roads within the Installation, including some gravel roads in the NDRAs and IAs, allow access to other areas of the Installation. Within portions of the ROI, the proximity of residents to major roads within 500 meters of their homes and traffic is a higher percentile (or more common) than EPA Region 6 or the U.S. as calculated from the 2011 U.S. Department of Transportation Traffic Data (EPA 2016, 1; EPA 2015g, 27 to 29, 36).

Planned traffic improvements in the ROI include enhancements to the interchange at U.S. Highway 62 at Interstate 44, widening and resurfacing of State Highway 49 from the eastern edge of Wichita Mountains NWR for approximately 2.8 miles, and improvements to surface and right-of-way for State Highway 58 from State Highway 49 northwest (Oklahoma Department of Transportation 2015, 1). These projects are planned through 2019.

*No Action Alternative:* Under the No Action Alternative, a negligible change in traffic patterns or LOS is anticipated as current activities would be continued.

*Proposed Action:* The construction phase of the Proposed Action would result in temporary decreases to LOS for roadways associated with the ingress and egress of the Installation (for workers and construction vehicles) as well as access roads for construction of firebreaks and WVRAs. Aerial spraying would involve minor, temporary increases to roads associated with nearby airports (Section 3.2). Construction of new permanent transportation routes is not anticipated. To minimize the effect on LOS, construction vehicles or workers entering the Installation would avoid peak traffic times. Construction vehicles would be parked to avoid conflicts with traffic, construction adjacent to roads would be signed, and, where necessary, traffic would be directed by construction workers. To prevent damage from heavy vehicles on roads, traffic would be routed on roads that are designed to support this use. Potentially unsafe damage to roads during construction would be signed to alert motorists and repaired as soon as

possible. Therefore, the Proposed Action would have a less than significant effect on transportation.

*Detailed Analysis Finding:* Based on the above findings, transportation is eliminated from detailed analysis in this EA.

### **3.15 Utilities and Infrastructure**

Utilities and infrastructure were divided into electricity and natural gas; potable water; wastewater; and solid waste for the purposes of this evaluation.

#### **3.15.1 Electricity and Natural Gas**

*Introduction:* Within the ROI, natural gas and electrical infrastructure is primarily located within the Cantonment Area and municipalities with limited utilities in less populated areas (Google Maps 2015 [GIS]). These resources are unlikely within the ranges, especially NDRAs and IAs.

*No Action Alternative:* The No Action Alternative would not require new natural gas or electrical capacity or transmission facilities. It would also not require relocation of existing infrastructure. Maintenance activities would remove vegetation above ground level and would not require removal of soil or rock which could affect underground utilities. During maintenance activities and aerial spraying, care is taken to avoid contact with overhead electric transmission lines. Any accidental damage or contact with utilities would be immediately reported to the utility. Therefore, the No Action Alternative would have less than significant effect on natural gas and electrical infrastructure.

*Proposed Action:* The Proposed Action would not require new natural gas or electrical infrastructure. It would also not require relocation of existing infrastructure. During construction of firebreaks and WVRAs, care would be taken to identify and avoid contact with overhead transmission lines. Heavy equipment would be parked in areas without underground utilities to prevent soil compression wherever possible. Maintenance activities would remove vegetation above ground level and not require removal of soil or rock which could affect underground utilities. During maintenance activities and aerial spraying, care is made to avoid contact with overhead electric transmission lines. Any accidental damage or contact with utilities would be immediately reported to the utility. Therefore, the Proposed Action would have a less than significant effect on natural gas and electrical infrastructure.

*Detailed Analysis Finding:* Based on the findings above, natural gas and electrical infrastructure are eliminated from further analysis in the EA.

#### **3.15.2 Potable Water**

*Introduction:* Surface water is a preferred source for potable drinking water due to groundwater quality (Section 3.9). Potable water for the Installation is provided by the City of Lawton under contract (Louis Berger Group, Inc. 2013, 3-74). The raw water source is Lake Lawtonka, with additional raw surface water available from Lake Ellsworth and Lake Waurika (Figure 3.15-1). Public water supply (PWS) surface water intakes within the ROI are located at or near Lake

Elmer Thomas. Other PWS intakes outside of the ROI are located near Lake Ellsworth. The quality of source water for intakes is protected and sources of contamination are prohibited within 600 ft of intakes (Oklahoma Administrative Code [OAC] 2014, 18-21).

The Oklahoma Wellhead Protection Program protects public groundwater drinking water supplies or public water supplies (PWS) by implementing the federal groundwater protection program in the State of Oklahoma (ODEQ 2011a, 1). The program protects groundwater supplies by preventing potential sources of contamination within Wellhead Protection Areas (WHPA), which are typically buffered by 300 ft (OAC 2014, 18-21). Potential sources can include underground and aboveground storage tanks, landfills, septic systems, stormwater runoff, and pesticide and herbicide application.

One WHPA was identified within the ROI which is located near Camp Eagle (Figure 3.15-1; OWRB 2015d, 1). The area is depicted as a PWS well on the figure. Other PWS wells outside of the ROI are located in Cache, Indianhoma, the Wichita Mountains NWR, and north of the Installation in rural areas. Data on private groundwater wells are not available from the ODEQ or OWRB websites.

Most water lines are located in the Cantonment Area and municipalities off the Installation. The City of Lawton's water mains are located on the Installation under an easement. The water lines begin at a water treatment plant connected to Lake Lawtonka, north of the installation. On the Installation, the easement begins near the James A. Manning State Fish Hatchery and crosses the Installation southeasterly before turning south and eventually ending at the southern boundary (City of Lawton Engineering Division 2015, 1).

*No Action Alternative:* The No Action Alternative would not construct or alter existing surface water intakes or groundwater wells and WHPAs. Groundwater and surface water hydrology would not be significantly affected (Section 3.9). Surface water runoff from maintenance activities would include required BMPs, such as restoration of pre-construction contours of stream crossings as described in Sections 3.5.1 and 3.91, and/or SWPPPs if necessary. These activities would prevent stormwater runoff into surface water sources and WHPAs, and respond to emergency spills (Gene Stout and Associates 2013, 70). Herbicide application would not occur within WHPAs or sources of surface water PWS intakes. Applications would comply with label directions to prevent groundwater and surface water contamination (Section 3.7). Selective placement of heavy equipment would prevent compaction of existing water transmission lines. Maintenance activities would not involve movement of soil or rock. Any accidental damage to water infrastructure would be immediately reported to the responsible utility. Therefore, the No Action Alternative would have a less than significant effect on potable water supplies.

*Proposed Action:* The Proposed Action would not involve the new construction or alteration of existing surface water intakes or groundwater wells and WHPAs. Groundwater and surface water hydrology would not be significantly affected (Section 3.9). Surface water runoff from maintenance activities would conform to required BMPs, such restoration of pre-construction contours of stream crossings as described in Sections 3.5.1 and 3.91, and/or SWPPPs if necessary. These activities would prevent stormwater runoff into surface water sources and WHPAs and respond to emergency spills (Gene Stout and Associates 2013, 70). Herbicide

application would be limited to the Installation, and it is prohibited in WHPAs and at sources of surface water PWS intakes. Applications would comply with intended manufacturer uses to prevent groundwater and surface water contamination (Section 3.7).

Heavy equipment would be placed in selected locations to avoid compaction of existing water transmission lines and the Lawton water easement. Construction of new firebreaks and WVRAs, especially FBRW56 which would be constructed within and adjacent to a water line easement, would avoid access conflicts with the City of Lawton water line and its mains per communication with Mr. Clint Langford, Fire Chief, Fort Sill Emergency Services, September 29, 2015, and Mr. Afsaneh Jabbar, PE, Director, City of Lawton Water and Wastewater, September 22, 2015. Construction and maintenance activities would not involve movement of soil or rock. Accidental damage to water infrastructure would be immediately reported to the responsible utility. Construction and short-term increases in construction workers would not generate large new demands for potable water. Therefore, the Proposed Action would have a less than significant effect on potable water supplies.

*Detailed Analysis Finding:* Based on the findings above, potable water supply is eliminated from detailed analysis in this EA.

### **3.15.3 Wastewater**

*Introduction:* The National Pollutant Discharge Elimination System (NPDES) regulates point source or direct discharges of pollutants in waters of the U.S. under the CWA (EPA 2014, 1). Industrial, municipal, and other facilities must obtain an NPDES permit to discharge wastewater. Within Oklahoma, the Water Quality Division of ODEQ implements the NPDES program (ODEQ 2011b). ODEQ also regulates industrial wastewater surface impoundments and associated tank systems for industrial wastewater (ODEQ Water Quality Division 2015, 1-2), which include total retention surface impoundments for the treatment and final disposal of wastewater. The disposal of biosolids is also regulated. Biosolids are nutrient-rich organic materials resulting from the treatment of domestic sewage (EPA 2012c, 1-2). The Oklahoma Solid Waste Management Act regulates the land application of biosolids including land application (ODEQ 2015a, 1).

Fort Sill maintains a wastewater treatment plant that discharges to East Cache Creek (Louis Berger Group, Inc. 2013, 3-74). Pollutant Discharge Elimination System (PDES) discharges, regulated under NPDES, are located within the ROI near Lake Elmer Thomas and Medicine Creek and adjacent to Sitting Bear Creek, east of the Cantonment Area (Figure 3.15-1). Total retention lagoons are lagoons designed to hold non-industrial wastewater without a discharge point. Four active total retention lagoons are located in the ROI, including one southeast of Medicine Creek near the north Installation boundary; one south of Medicine Park; one south of Medicine Park within the Installation boundary; and one southeast of Lake Elmer Thomas. A lagoon which is in the process of closing is located near the Dodge Hill Landfill in the East Range. Camp Eagle Lagoon was previously located east of Highway 115, but the lagoon is currently dry. The Central Wash Facility that holds an industrial waste water permit is located south of Miner Road, between Tower Two Road and Cub Bison Road. Eight land application sites for biosolids are located within the East Range on agricultural fields.

*No Action Alternative:* The No Action Alternative would not alter existing wastewater treatment facilities or changes in the demand for wastewater treatment. Activities would take place outside the permitted boundaries of these facilities. Therefore, the No Action Alternative would have a negligible effect on wastewater.

*Proposed Action:* The Proposed Action would not alter existing wastewater treatment facilities or significantly change the demand for wastewater treatment due to temporary increases in wastewater generated by contractors on the Installation. Ongoing activities would take place outside the permitted boundaries of these facilities and herbicide application would not occur within lagoons. Therefore, the Proposed Action would have a negligible effect on wastewater.

*Detailed Analysis Finding:* Based on the findings above, wastewater is eliminated from detailed analysis in this EA.

#### **3.15.4 Solid Waste**

*Introduction:* The transportation and disposal of solid wastes in Oklahoma is regulated under the Oklahoma Solid Waste Management Act, the Oklahoma Solid Waste Management Regulations, and the Resource Recovery Act, Public Law 94-580 (AGEISS, Inc. 2013, 1-1 to 1-7).

Solid waste generated within the Installation is stored, collected, and disposed of at the Installation (AGEISS, Inc. 2013, 2-1 to 2-4, 4-1 to 4-8). Construction and demolition (C&D) waste typically includes lumber, timber, reinforcing steel, pipes, wires, asphalt, and other debris generated by demolition of old buildings, rehabilitation, and new construction. If C&D waste cannot be reused or recycled, it is disposed of in the C&D landfill unit. Loads that contain large amounts of recyclable waste are transported to the recycling center for additional processing.

Yard wastes typically consist of grass, weeds, wood, and trimmings from trees and shrubbery. Tree limbs are generally sent to Fort Sill's permitted composting facility, converted to wood chips, and used by the DPW service contractor throughout the Installation. The composting facility has a current capacity to process less than 1,200 tons per year of tree waste. Unbagged yard waste, which cannot be reused or temporarily exceeds storage capacity at the permitted composting facility, is disposed of at the C&D landfill unit. However, bagged yard waste is disposed of at the Municipal Solid Waste (MSW) landfill unit. Fort Sill also has a permitted composting facility that is currently idle but which can be reopened if necessary to accommodate demand (AGEISS, Inc. 2013, 5-5 to 5-6). Bulky yard waste, including large trees, may be used elsewhere on the Installation for road or erosion stabilization.

MSW or residential and commercial and institutional solid wastes generated at the Installation are disposed of at the MSW landfill unit. Special wastes, depending on the type, may be disposed in permitted units at the Dodge Hill Landfill or by private contractors of the Installation. The Dodge Hill Landfill is expected to have adequate capacity to dispose of all solid waste types generated by the Installation for the next 10 to 20 years, excluding the possibility that there would be a significant increase in solid waste generation rates.

The City of Lawton landfill is currently being expanded and accepts waste within its service area but not from the Installation (AGEISS, Inc. 2013, 4-11 to 4-12). Off-site recycling facilities are also available.

*No Action Alternative:* The No Action Alternative would generate yard waste and bulky trees and other waste consistent with prior solid waste generation within the Installation. Contractors may temporarily generate and dispose of MSW during construction when traveling through nearby communities. However, the Installation and Lawton's solid waste systems have adequate capacity to collect, transport, dispose, and store this waste. Therefore, the No Action Alternative would have a negligible effect on solid waste.

*Proposed Action:* The Proposed Action would generate trees, tree limbs, and yard waste associated with the WVRA and firebreak construction and later maintenance. A majority of that waste would be reused as wood chips or potentially composted with the reopening of the permitted compositing facility. Additional resources would be required for the composting facility to process any of the tree waste from firebreak or WVRA tree waste. Current fence and roadside tree removal contracts are required to grind trees, spread chips on site for erosion control, and haul excess chips to the composting facility. Some bulky tree waste may be disposed of within the C&D landfill. The C&D landfill takes in less than 15,000 tons of waste per year. The estimated volume of tree waste would be more than a threefold increase in landfilled waste. This increase in waste generated could be mitigated by grinding on site or lease of grinding equipment to process waste at the compost facility. These wastes would be generated and disposed of at the Installation. Based upon existing capacity, Fort Sill has adequate capacity to collect, transport, and manage this waste at the Dodge Hill Landfill. MSW would also be generated by workers within the Installation and as workers are entering the Installation, but the change in MSW volume would be negligible. The City of Lawton would have adequate capacity to collect, transport, and store this waste for this temporary traffic of contractors. Therefore, the Proposed Action would have a less than significant effect on solid waste.

*Detailed Analysis Finding:* Based on the findings above, solid waste is eliminated from further analysis in the EA.

### **3.16 Visual and Aesthetic Resources**

*Introduction:* In general, aesthetic resources include natural and manmade features of the environment that provide diverse and pleasant surroundings for human enjoyment and appreciation. These activities include sights, sounds, and scents (Reinke, Ph.D. and Swartz, Esq. 1999, gl-229). For the purposes of this EA, the term aesthetics includes the subjective perception of natural beauty in a landscape. Visual resources are a subset of aesthetic resources that consist of natural and cultural features which can potentially be viewed (Reinke, Ph.D. and Swartz, Esq. 1999, gl-248). Degradations or alterations of these resources can impair the enjoyment of aesthetic resources. A viewshed is defined as the view of, or from, a visual resource and is often considered in assessment of visual impacts considering topography and vegetation height.

To evaluate aesthetic resources, the following factors are often considered:

- Topographical variation (hills, valleys, etc.);
- Prominence of water in the landscape (rivers, lakes, etc.);
- Vegetation variety (woodlands, meadows);
- Diversity of scenic elements;
- Degree of human development or alteration;
- Overall uniqueness of the scenic environment compared with the larger region; and
- Individual regulations to protect scenic resources.

For the purpose of this EA, the ROI was used as the basis to evaluate the effects of the alternatives on viewsheds from nearby residences outside of the Installation and scenic byways and the air quality on aesthetic resources. The ROI encompasses identified scenic resources near the Proposed Action. Within the ROI, gently rolling hills occur at the Installation (Section 3.13), and several lakes border the Installation (Section 3.17). The vegetation includes agricultural lands, grasslands, and forests (Section 3.4).

The Oklahoma Scenic Rivers Act encourages the preservation of the areas designated as "scenic river areas" in their natural scenic state (Oklahoma Scenic Rivers Commission 1977, 1-12). None of the state protected scenic rivers are within the ROI. On a national level, wild and scenic rivers are protected under the Wild and Scenic Rivers Act and managed by the National Wild and Scenic Rivers System (NWSRS) (NWSRS 2015a, 1-2). The ROI does not contain any national wild and scenic rivers (NWSRS 2015b, 1).

Another national aesthetic program is the America's Byways, which is a collaboration between communities and the FHWA to protect roads based upon archaeological, cultural, historic, natural, recreational, or scenic qualities (FHWA 2015a, 1). The Wichita Mountains Byway includes State Highway 49 through the Wichita Mountains NWR and east of Medicine Park to Interstate 44 (FHWA 2015b, 1). It is a National Scenic Byway focused upon views of the protected valleys of the Wichita Mountains, which are managed by the Wichita Mountains NWR (FHWA 2015b, 1). Portions of the Wichita Mountain Byway are located within the ROI (FHWA 2015c, 1; Figure 3.16-1).

Other recreational and aesthetic resources within the ROI and outside of the Installation include the Jack Laughter Park and James A. Manning State Fish Hatchery per communication with Mr. Reynolds, Public Works Representative for Medicine Park, August 12, 2015. These resources are located in Medicine Park, and their view onto the Installation is largely obstructed by topography. No other scenic viewsheds outside the Installation were identified by local officials (Rogalski 2015, 1; Wermey 2015, 1-2). Other valuable aesthetic resources within the Installation include the Medicine Creek and Rucker's Park, the Fort Sill Golf Course, and areas of significant topographic relief within the Installation or lookout towers (World Street Map, ESRI 2015 [GIS]).

*No Action Alternative:* Ongoing activities would typically occur in the interior of the Installation and would only affect previously disturbed locations. Aerial spraying would denude some vegetation, but this would typically occur within the interior of the Installation and away from the Cantonment area and its recreational resources. Some viewsheds from historic resources or the National Scenic Byway's southern view (which is greatly disturbed) would continue to have

limited vegetation of lower heights. Therefore, less than significant impacts on visual and aesthetic resources are anticipated under the No Action Alternative.

*Proposed Action:* A majority of the ROI surrounding the Proposed Action is undeveloped and has over 1,000 ft of topographic relief with a variety of vegetation heights (Sections 3.4 and 3.13). The construction of firebreaks would not alter vegetation within the viewsheds of the Cantonment Area. FBWR58, FBRW51, and FBWR56 are located near Medicine Park, but the topography of the area is expected to obstruct much of the view of the firebreaks from Medicine Park.

The WVRAs would not be located close to lakes, except the WVRA to the west of Lake Elmer Thomas near Medicine Park (Figure A-3). This WVRA would border an existing firebreak, but not along Lake Elmer Thomas, to minimize effects on the viewshed from the lake. Aerial spraying could remove some vegetation in the interior. Dead wood may be seen during the three years after the spraying event.

To evaluate the potential aesthetic effects on visual resources, aerial photography and street view photography were evaluated to identify areas where views of natural resources from residences and parks might be affected, and to assess the effects on established scenic resources (USDA NAIP, 2014 [GIS]; USGS NLCD, 2011 [GIS]; Google 2013, 1-2).

The areas of Lawton, Cache, and Elgin that are adjacent to Fort Sill have a direct line-of-sight to the WVRAs of the Proposed Action. In many areas, the WVRAs would remove vegetation from the viewshed of Installation residents. WVRAs along the perimeter of Fort Sill would not affect viewsheds surrounding major recreational areas such as Jack Laughter Park and James A. Manning State Fish Hatchery because the rolling topography obstructs views of the WVRAs per communication with Mr. Reynolds, Public Works Representative for Medicine Park, August 12, 2015; Mr. Rogalski, Lawton Planning Director, on August 13, 2015; and Mr. Wermey, Comanche County Assessor's Office, August 17, 2015. Proposed WVRAs along the Fort Sill perimeter would cause a negligible impact to the viewshed of the area. During construction and maintenance, short-term visual and noise impacts would occur, associated with construction equipment and trucks. Construction would occur during the day to prevent light pollution at night.

To evaluate the effects of WVRAs in proximity to the Wichita Mountain Scenic Byway, the viewsheds of two sample areas were investigated using Google Street View accessed during July 2013 (Google 2013, 1-2). These include Byway Area of Investigation #1, located near the Wichita Mountains NWR, and Costain Hill, Byway Area of Investigation #2, near the intersection of State Highway 49 and Interstate Highway 44 (FHWA 2015c, 1; Figure 3.16-1). The investigation suggested that more pristine natural views are north of the Wichita Mountain Scenic Byway, and altered landscapes are located to the south. This includes the Wichita Mountains NWR from Byway Area of Investigation #1. Views to the south typically include a fence delineating the Installation and grasslands. Within Byway Area of Investigation #2, the southern views of the proposed WVRA already include a fence, an existing firebreak, and a transmission line. The transmission line detracts from the aesthetic value of views into Fort Sill.

Based upon the factors above, impacts to visual and aesthetic resources under the Proposed Action would be less than significant.

*Detailed Analysis Finding:* Based on the findings above, consideration of visual and aesthetic resources is eliminated from detailed analysis in this EA.

### **3.17 Water Resources**

Water resources are divided into surface water quality, groundwater quality, and water supply for the purposes of this evaluation.

#### **3.17.1 Surface Water Quality**

*Introduction:* Under § 303d of the CWA, states are required to identify all waters where pollution controls are not sufficient to attain or maintain applicable water quality standards (EPA 2012d, 1-2). Typical sources of impairment include discharges of pollutants or runoff. If the waterbody is impaired or threatened for one or more designated uses (e.g., water supply) by a pollutant or pollutants, it requires a Total Maximum Daily Load (TMDL). The TMDL determines the sum of individual waste load allocations from discharges, runoff, and natural background conditions that are acceptable for a stream to meet its designated uses (OWRB 2015e, 6). Category 5 streams are defined by the EPA as streams where the water quality standard is not attained, and therefore, the stream is impaired. Category 4a streams include impaired or threatened streams where a TMDL is not required by EPA or the state, but has been completed (ODEQ 2015b, 2-5).

The Installation is located within the Beaver-Cache Region as defined by the *Oklahoma Comprehensive Water Plan* (OCWP), near the headwaters of the Deep Red, Cache Creek, and Beaver Creek Basins (OWRB 2015e, 1). General information on surface water is provided in Section 3.5.1. No watersheds within the ROI contain outstanding waterbodies as designated by the State of Oklahoma (OWRB 2011, 1). Within the ROI, three waterbodies are Category 5 based upon their water quality attainment: Lake Elmer Thomas, Blue Beaver Creek, and East Cache Creek (Figure 3.17-1). No waterbodies within the ROI are classified as Category 4a.

The Oklahoma Conservation Commission (OCC) has the statutory responsibility for monitoring streams to identify impaired waterbodies as a result of diffuse sources of pollution (OCC 2015, 1-2). In 2008, upper East Cache Creek was listed as impaired due to low dissolved oxygen, pH, sulfates, and TDS. Lower East Cache Creek was listed as impaired due to turbidity and TDS. The TMDL for East Cache Creek to address bacteria and turbidity has since been completed (ODEQ 2015b). Blue Beaver Creek is impaired due to bacteria and its TMDL has not yet been completed (ODEQ 2015b, Appendix B, 34). The TMDL for Lake Elmer Thomas to address dissolved oxygen has not yet been completed (ODEQ 2015b, Appendix B, 34).

*No Action Alternative:* The No Action Alternative would continue to maintain existing firebreaks and utilize aerial spraying. The continued removal of vegetation may increase erosion, which can increase turbidity and TDS. However, this would be minimized by BMPs, including avoiding soil removal during WVRA construction and reseeding with native grasses to prevent erosion (Section 3.13). BMPs, including the SWPPP, as required, certification of

personnel using herbicides, and a related spill prevention control and countermeasures plan (SPCCP), would also be used to prevent and respond to accidental releases of herbicides (Section 3.7). The No Action Alternative would not introduce other pollutants of concern directly to the 303(d) listed streams within the ROI. Therefore, the No Action Alternative would have a negligible effect on surface water quality.

*Proposed Action:* The Proposed Action includes construction of firebreaks and WVRAs that cross both intermittent and perennial streams (Figure 3.9-1). This construction would result in removal of riparian corridors, but would have a less than significant effect on surface water hydrology (Section 3.9.1). The removal of riparian corridors and associated shade typically results in increases in thermal loading to the stream (Leinenbach, McFadden and Torgersen 2013, 1-3). In general, the WVRAs and firebreaks cross the streams at an angle near 90 degrees to reduce fragmentation of riparian canopy and the associated increase in thermal loading.

However, FBWR56 parallels a tributary of Medicine Creek and would result in the removal of approximately 350 ft of the tributary's riparian canopy, at a width of up to 40 ft, near the tributary's crossing of Deer Creek Canyon Road and to the east of the intersection of Brush Canyon Road and FBWR56 (Figure A-3). This would result in minor increases in thermal loading for this tributary, which does not flow directly into the 303(d) listed streams.

The removal of vegetation may increase erosion, which can increase turbidity and TDS. However, this would be minimized by BMPs, including the SWPPP, as required, swale kick outs to vegetated areas, and other soil erosion and restoration procedures in the INRMP (Section 3.13). BMPs, SWPPP, as required, certification of personnel using herbicides, related spill prevention control and countermeasures, would also be used to prevent and respond to accidental releases of herbicides and construction vehicle and equipment fluids (Section 3.7). Consequently, the Proposed Action would have less than significant, direct and indirect effects on surface water quality.

*Detailed Analysis Finding:* Based on the findings above, surface water quality is eliminated from detailed analysis in this EA.

### **3.17.2 Groundwater Quality**

*Introduction:* The ODEQ is responsible for monitoring and regulating the quality of Oklahoma's groundwater (ODEQ 2011a, 1). Federal programs for groundwater protection include regulation of underground injections, wellhead protection programs, and monitoring for drinking water supplies (Safe Drinking Water Act [SDWA]); pollution control for surface water and related discharges (CWA); restrictions on hazardous waste management, transport, storage and remediation (RCRA); CERCLA; Toxic Substances Control Act; and procedures for the use, monitoring, and disposing of pesticides as well as training for commercial and private applicators of pesticides (Federal Insecticide, Fungicide, and Rodenticide Act [FIFRA]) (Buchholz 2015, 1). Each of these laws is administrated by the EPA, unless transferred to a state government. In addition to these restrictions, the Installation complies with DoD and Installation-specific regulations to protect groundwater (Section 3.7). Wellhead protection laws, groundwater resources, and the quality of these sources are described in Section 3.9.2.

In locations with alluvial aquifers, the potential for groundwater contamination as a result of accidental spills is higher due to the surficial occurrence of alluvial aquifer. Consequently, the alluvial aquifers near Cache Creek and Beaver Creek (Section 3.9.2) are more vulnerable to groundwater contamination than bedrock aquifers within the ROI.

*No Action Alternative:* Under the No Action Alternative, erosion and herbicide spills or releases would be minimized by BMPs, including the SWPPP, as required, certification of personnel using herbicides, and related spill prevention control and countermeasures (Sections 3.7 and 3.8). The No Action Alternative would have a less significant effect on hydrogeology (Section 3.9.2), WHPAs (Section 3.15.2), and surface water quality (Section 3.17.1). Therefore, the influence of the No Action Alternative on groundwater quality would be minimized, resulting in a less than significant effect.

*Proposed Action:* The Proposed Action would generate additional runoff, but would not involve new WHPAs or alteration of existing WHPAs (Section 3.15.2). The alluvial aquifers near Cache Creek and Beaver Creek (Section 3.9.2) are more susceptible to contamination than other bedrock aquifers. Current BMPs, including the SPCCP (Section 3.8) and SWPPP, as required, would be followed. Less than significant effects on hydrogeology (Section 3.9.2), WHPAs (Section 3.15.2) and surface water quality (Section 3.17.1) are anticipated; therefore, less than significant direct effects on groundwater quality are expected.

*Detailed Analysis Finding:* Based on the findings above, groundwater quality is eliminated from detailed analysis in this EA.

### **3.17.3 Water Supply**

*Introduction:* Sources of potable water within the ROI are described in Section 3.15.2.

*No Action Alternative:* The No Action Alternative would have a less than significant effect on infrastructure to supply public water or the quality of surface and groundwater supplies (Sections 3.15 and 3.17). Furthermore, it would not alter the hydrology and hydrogeology (Section 3.9) nor decrease the availability of surface water or groundwater and degrade water supplies. Therefore, the No Action Alternative would have a less than significant effect on water supply.

*Proposed Action:* The Proposed Action would not have a significant effect on infrastructure to supply public water or the quality of surface and groundwater supplies (Sections 3.15 and 3.17). Furthermore, it would not alter the hydrology and hydrogeology (Section 3.9) and would not significantly decrease the availability of surface water or groundwater nor degrade water supplies. Therefore, the Proposed Action would have a less than significant effect on water supply.

*Detailed Analysis Finding:* Based on the findings above, water supply is eliminated from detailed analysis in this EA.

## CHAPTER 4 ENVIRONMENTAL EFFECTS

### 4.1 Introduction

This section contains a summary of resources carried forward for further analysis that may have significant effects or involve compensatory mitigation, including direct, indirect, and cumulative effects; a summary of BMPs; irretrievable uses of nonrenewable resources; and relevant permits and authorizations.

### 4.2 Effects on Health and Safety

The No Action Alternative would not provide additional protection or mitigation measures that would enhance the safety of the built or natural environment related to the potential threat of wildfires at the Installation. Since this is the case, health and safety has been carried forward for detailed analysis in this EA.

#### 4.2.1 No Action Alternative

The No Action Alternative would involve the continued application of herbicides to control noxious weeds and honey mesquite, prescribed burns, and use of a combination of light and heavy equipment to remove fire fuel. The No Action Alternative would continue existing fire protection measures and would not create any new health and safety risk for the ROI, but it would not provide a greater level of fire protection than currently exists, as defined by the Purpose and Need (Section 1.2). Therefore, the No Action Alternative would have a significant adverse effect on health and safety.

#### 4.2.2 Proposed Action

The No Action Alternative's individual components are included in the Proposed Action with three, additional proposed components: the construction and maintenance of proposed firebreaks; the construction and maintenance of WVRAs; and programmatic aerial spraying. Aerial spraying would be evaluated on a case-by-case basis under existing policies that include measures to ensure the health and safety of the personnel applying the herbicides, and military personnel and the civilian population within the ROI. This includes BMPs to prevent air quality effects (Section 3.3) and prevent use of herbicides in areas with high concentrations of children. The Proposed Action would reduce the likelihood of wildfires and provide greater safety for firefighters, military personnel, and civilians. The Proposed Action would have a beneficial, less than significant effect on health and safety.

### 4.3 Cumulative Effects

Cumulative effects are the sum of the impacts to the environment that result from incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions, regardless of who initiates the action.<sup>43</sup> EPA and NEPA require evaluation of

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<sup>43</sup> 40 CFR §1508.7.

cumulative effects. If a proposed action would cause any significant cumulative effects, an evaluation of whether a proposed action might cause adverse impacts on a resource in combination with other past, present, or reasonably foreseeable actions is required (EPA 1999, 1-22). Reasonably foreseeable projects are defined as those that are not speculative in nature.

Past and present actions at the Installation include military training and operations; firebreak maintenance; aerial spraying; expansion of the R-5601 and other improvements to air operations (Section 3.2); BCVI monitoring and protection program evaluated under a BO (Sections 3.4 and 4.2); hazardous material management (Section 3.7); and current agricultural leasing (Section 3.13). The expansion of visitor resources at the Wichita Mountains NWR is another ongoing activity (77 FR 2012, 47657-47660). A review of transportation projects indicates that no major transportation improvements outside of the Installation and within the ROI are anticipated in 2015 or early 2016 (ODOT 2015, 1).

Reasonably foreseeable actions include the removal of vegetation near Deer Creek Canyon Road by the Installation (Section 2.4); prescribed burns under other programs (Section 3.3); BCVI monitoring and protection program evaluated under a BO (Section 3.4); hazardous materials management (Section 3.7); planned transportation improvements outside of the Installation and within the ROI, including the intersection of U.S. Highway 62 and Interstate 44 and State Highways 49 and 58 (Section 3.14); and continued improvements for recreational facilities at the Wichita Mountains NWR.

A review of the USACE Tulsa District's 2015 public notices did not identify any additional proposed projects requiring USACE permits within the ROI (USACE Tulsa District 2015, 1-2). On August 25, 2015, the Installation sent coordination letters to the City of Cache, Comanche County, City of Elgin, City of Lawton, the Town of Medicine Park, and state representatives and senators requesting input on future projects and comments on the Proposed Action. The City of Lawton responded on September 22, 2015 requesting continued access to its 42-inch water line, which will be maintained (Appendix B, Section 3.15.2). The City of Lawton also requested that erosion and water retention is addressed by Fort Sill as a result of the Proposed Action per communication with Mr. Rogalski, Lawton Planning Director, on August 13, 2015 (Section 3.9.1). Comanche County has an extensive dam rehabilitation effort which includes projects in Cache, Lawton, and Medicine Park within and near the ROI (Comanche County 2015b, 1). To date, no response was received from the City of Cache, City of Elgin, the Town of Medicine Park, or state representatives and senators.

All of the aforementioned activities are subject to their own permitting processes that are designed to reduce overall environmental impact. When taken together, it is likely the past, present, and reasonably foreseeable future activities have the potential to result in a cumulative impact on the environment, including minor degradations of water quality, minor effects on hydrology, minor decreases in habitat for fauna, less than significant effects on BCVI and migratory bird habitat, and temporary changes in traffic patterns.

The Installation's Proposed Action does not result in significant impacts to hydrology or geohydrology, decreases in habitat for fauna, adverse effects on BCVI and migratory bird habitat, aquatic biological resources, surface water, or temporary changes in traffic patterns.

Adherence to existing regulations, guidance documents, and BMPs reduces impacts below a level of significance.

#### 4.4 Best Management Practices

To avoid and minimize impacts, the following BMPs would be implemented as part of activities performed during the Proposed Action:

- Installation EQD and DPW requirements for herbicide application (Section 2.2.1);
- Firebreak/Fuel Removal and Maintenance SOPs (Section 2.2.2);
- Restrictions for contractors constructing and maintaining firebreaks (Section 2.2.2);
- Individual review of each aerial spraying operation using the ASSON (Section 2.2);
- Established operational and location restrictions under established airspace restrictions (Section 3.2);
- Avoidance of aerial spraying during high wind conditions (Sections 3.3 and 3.13);
- Limited, on-label use of acceptable herbicides (Section 3.3);
- Limitations on construction and other activities to protect migratory birds, eagles, and other protected species and comply with the MBTA and BGEPA (Section 3.4);
- Permanent and temporary stormwater BMPs from individual SWPPPs, as required, to comply with the *Surface Water Management Plan*, as necessary (Sections 3.5.2 and 3.9.1);
- Avoidance of construction buffers to protect cultural resources and compliance with other cultural resource SOPs (Section 3.6);
- Restrictions on the use, storage, and disposal of hazardous materials, including use of certified herbicide applicators and accidental spill response (Section 3.7);
- Avoidance of soil and rock removal during construction (Section 3.13);
- Construction during normal weekday business hours (Section 3.11);
- Use of construction mufflers (Section 3.11);
- Avoiding construction during BCVI breeding season to reduce noise impacts (Section 3.11);
- Tree removal followed by restoration per procedures included in the DPW SOPs (Section 3.13.1);
- Controls to prevent soil erosion and compaction (Section 3.13.1);
- Queuing of construction traffic to avoid reduction in LOS, and posting safety warnings for construction near roads (Section 3.14);
- Avoidance of overhead and underground utility lines, including the City of Lawton's underground water main lines (Section 3.15);
- Restrictions to prevent herbicide applications in playgrounds, WHPAs, and other PWS sources (Sections 3.8 and 3.17); and
- Avoidance of habitat fragmentation in riparian corridors (Section 3.17).

#### 4.5 Irretrievable Uses of Nonrenewable Resources

The Proposed Action would consume electricity and fuel during construction and maintenance of firebreaks and WVRAs as well as during aerial spraying. The Proposed Action would not

prevent the future return of vegetation, habitat, and nutrient renewal if the Proposed Action is discontinued, and water resources would not be permanently removed from the hydrologic cycle.

#### 4.6 Permits and Authorizations

The Proposed Action would comply with all relevant EOs, ARs, and Installation, state, and federal regulations. The following guidance, SOPs, permits, and authorizations apply to the Proposed Action:

- Navigable airspace plans and policies for R-5601 and ARTC (Section 3.2);
- CAA (Sections 3.3 and 3.7);
- Open Burning Rule (Section 3.3);
- ESA (Section 3.4.2);
- MBTA (Section 3.4.3);
- BGEPA (Section 3.4.3);
- CWA (Sections 3.5.1 and 3.17);
- NHPA (Section 3.6);
- AIRFA (Section 3.6);
- NAGPRA (Section 3.6);
- Installation Cultural Resources SOPs (Chapter 3.6);
- RCRA (Section 3.7);
- EPCRA (Section 3.7);
- CERCLA (Section 3.7);
- Community Environmental Response Facilitation Act of 1992 (Section 3.7);
- Asbestos Hazard Emergency Response Act (Section 3.7);
- Spill Prevention, Control and Countermeasure Rule (Section 3.7);
- EPA Regulation on Identification and Listing of Hazardous Waste (Section 3.7);
- EPA Regulation on Standards for the Management of Used Oil (Section 3.7);
- EPA Regulation on Designation, Reportable Quantities, and Notification (Section 3.7);
- EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance (Section 3.7);
- Toxic Substances Control Act of 1976 (Section 3.7);
- AR 200-1 (Section 3.7);
- HMWMP (Section 3.7);
- IPMP (Section 3.7);
- TG No. 15 (Section 3.7);
- ITAM (Section 3.7);
- INRMP (Section 3.7);
- Oklahoma Department of Agriculture, Food, and Forestry Consumer Protection's Combined Pesticide Laws and Rules (Section 3.7);
- OSHA (Section 3.8);
- AR 385-10 (Section 3.8);
- EO 13045 (Section 3.8);
- NFIP and associated OWRB requirements (Section 3.9.1);

- EO 11988 (Section 3.9.1);
- SDWA (Section 3.9.2);
- Oklahoma groundwater regulations (3.9.2);
- EO 12898 (Section 3.12.2);
- FPPA (Section 3.13.3);
- Oklahoma Wellhead Protection Program (Section 3.15.2);
- NPDES (Section 3.15.3);
- Oklahoma Solid Waste Management Act (Section 3.15.4);
- Oklahoma Solid Waste Management Regulations (Section 3.15.4); and
- RCRA (Section 3.15.4).

Many of the components of the Proposed Actions are approved under individual Installation programs, including the ASSON; however, some activities would require permits if existing exemptions are exceeded. This includes:

- Construction of an area greater than 1 acre will require a General Permit for Stormwater Discharges on Construction Sites, which is typically a responsibility of the contractor unless otherwise exempted; and
- Alteration of jurisdictional waters if permitting thresholds are exceeded will require compliance with the Clean Water Act and may require a General Permit or Individual Permit from USACE.

## CHAPTER 5 PUBLIC INVOLVEMENT

In accordance with public notification requirements, the Army published the Notice of Availability for the Draft EA and Draft FNSI in the Lawton Constitution on <<Insert Date>> and provided copies of each document to the Lawton Public Library at 110 SW 4th St, Lawton, Oklahoma 73501 as well as local governing officials and other interested parties. This includes a notice to demonstrate compliance with EO 11988, Floodplain Management. The Draft EA public comment period will last 30 days and end on <<Insert Date>>. All comments received from the draft review will be considered and incorporated into the final document.

In the future, the Army will announce the availability of the Final EA at the same locations as the Draft EA prior to signing of the FNSI. The public comment period for the Final EA will last 15 days, but could be extended to 30 days if major changes to the document occur. If no comments are received, the second review period may be omitted.

## CHAPTER 6 LIST OF PREPARERS

The management team is provided in Table 6-1; the list of preparers is provided in Table 6-2.

## CHAPTER 7 LIST OF REFERENCES

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## 7.1 GIS References

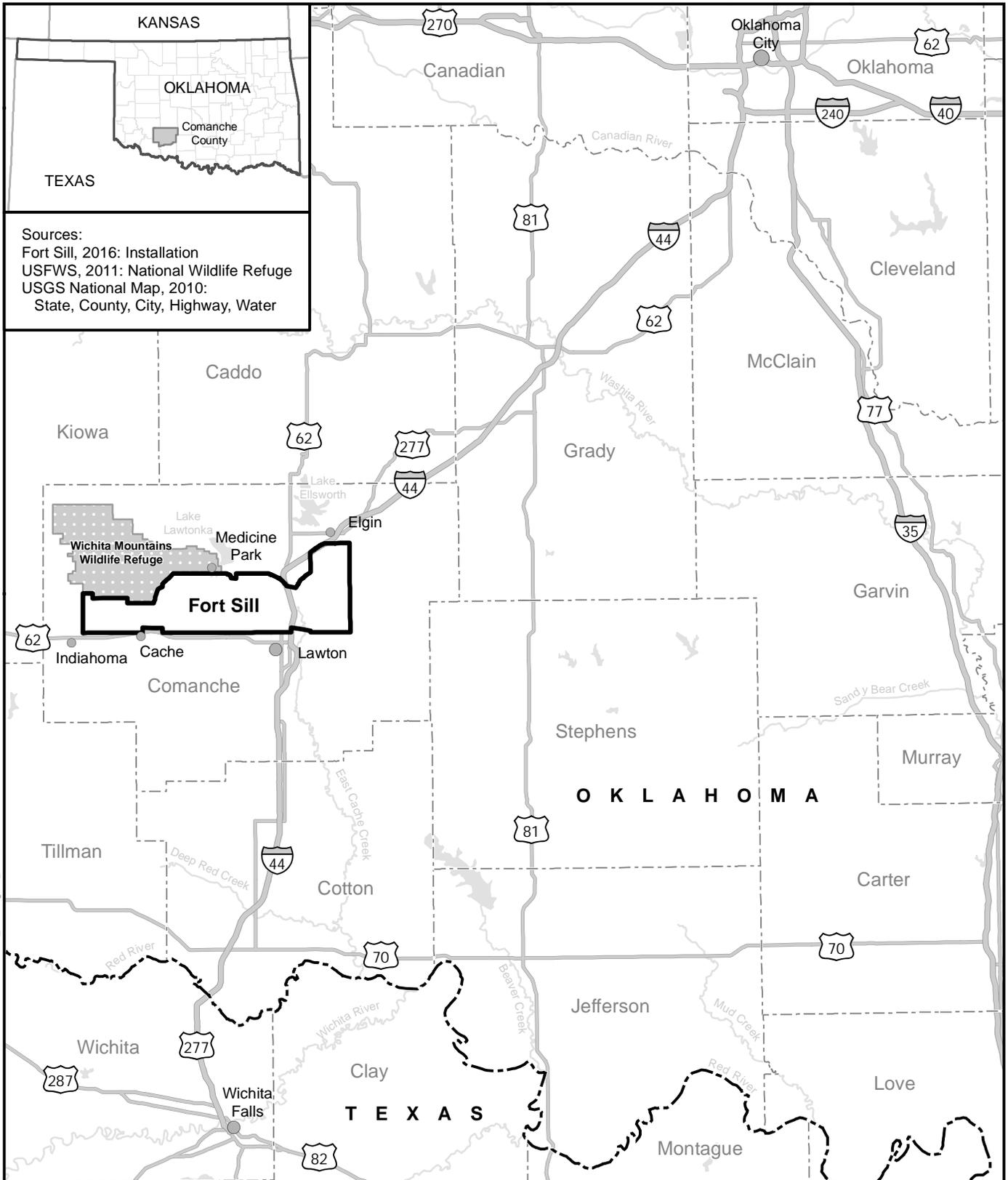
Data Layer	Source	Date from Metadata	Date Received from Ft. Sill	Feature Name	Notes
Minority Population 49% to 66%	EPA EJSCREEN	2014	N/A	EJScreen_Full	<a href="https://www.epa.gov/ejscreen">https://www.epa.gov/ejscreen</a>
Air Space	FAA	3/5/2015	N/A	Dallas-Ft Worth SEC 94.tif	<a href="https://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/vfr/">https://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/vfr/</a>
100-Year Floodplain	FEMA	2009, 2015	N/A	S_Fld_Haz_Ar	
500-Year Floodplain	FEMA	2009, 2015	N/A	S_Fld_Haz_Ar	
Wichita Mountains Scenic Byway	FHWA	N/A	N/A	OK_Wichita_Mtn_Byway.gif	<a href="http://www.fhwa.dot.gov/byways/byways/6334/maps">http://www.fhwa.dot.gov/byways/byways/6334/maps</a>
Approximate Extent of Medicine Park Wildfire (June 2011)	Fort Sill	N/A	4/7/2015	Medicine_Park_Wildfire_June2011	
Black-capped Vireo Nesting Area	Fort Sill	11/3/2008	3/11/2015	fauna_special_species_area	
Cantonment Area	Fort Sill	1/6/2010	12/13/2014	cantonment_area	
Dudded Impact Area (IA)	Fort Sill	2010	12/13/2014	impact_area	
Existing Firebreak	Fort Sill	12/11/2014	12/11/2014	fire_break_centerline	
Fauna Study Area	Fort Sill	1/7/2011	3/11/2015	fauna_study_area	
Fort Sill Boundary Line	Fort Sill	N/A	3/16/2016	Installation_L	
Fort Sill Boundary Outgrant	Fort Sill	N/A	3/16/2016	Outgrant_A	
Fort Sill Installation Boundary	Fort Sill	N/A	3/16/2016	Installation_A	
Leases	Fort Sill	N/A	2/24/2016	AgriculturalAndGrazingOutlease	
Mesquite savanna (MS)	Fort Sill	3/30/2015	3/30/2015	FuelLoadModel_2012	
Non-Dudded Range Area (NDRA)	Fort Sill	2010	12/13/2014	impact_area	
Prime Farmland	Fort Sill	5/3/2007	12/13/2014	MULegend_NRCS_Soil	

Data Layer	Source	Date from Metadata	Date Received from Ft. Sill	Feature Name	Notes
Proposed Firebreak (v1)	Fort Sill	12/22/2014	12/22/2014	proposed_fire_break_centerline_v1	
Soil Types	Fort Sill	5/3/2007	12/13/2014	MULegend_NRCS_Soil	
Streams	Fort Sill	2010	12/13/2014	surf_wat_course_centerline	
Water	Fort Sill	2010	12/13/2014	surface_water_body_area	
Woody Vegetation Removal Area	Fort Sill	March 2008	7/21/2015	Fire_Mitigation_Phase_3_Proposed	
Lagoons	Fort Sill / URS	N/A	3/17/2016	Lagoon_Points	
Proposed Firebreak	Fort Sill / URS	3/14/2016	12/22/2014	proposed_fire_break_centerline	
NWI Wetlands	NWI	10/1/2014	N/A	OK_Wetlands	
Impaired Waterbodies (303d), Category 4a & 5	ODEQ	2014	N/A	2014 303d Waterbodies	<a href="http://gis.deq.ok.gov/maps/">http://gis.deq.ok.gov/maps/</a>
Land Application Site	ODEQ	N/A	N/A	Land Application Sites	<a href="http://gis.deq.ok.gov/maps/">http://gis.deq.ok.gov/maps/</a>
PDES Discharge	ODEQ	N/A	N/A	PDES Discharges	<a href="http://gis.deq.ok.gov/maps/">http://gis.deq.ok.gov/maps/</a>
PWS Surface Water Intake	ODEQ	N/A	N/A	PWS Surface Water Intakes	<a href="http://gis.deq.ok.gov/maps/">http://gis.deq.ok.gov/maps/</a>
PWS Well	ODEQ	N/A	N/A	PWS Wells	<a href="http://gis.deq.ok.gov/maps/">http://gis.deq.ok.gov/maps/</a>
Total Retention Facility	ODEQ	N/A	N/A	Total Retention Facilities	<a href="http://gis.deq.ok.gov/maps/">http://gis.deq.ok.gov/maps/</a>
Impaired Waterbodies (303d)	OWRB	9/4/2012	N/A	OWRB_Lakes	
Impaired Waterbodies (303d)	OWRB	4/21/2011	N/A	OWRB_Streams	
Major Aquifers	OWRB	9/19/2011	N/A	gw_owrb_aquifers.shp	
Minor Aquifers	OWRB	9/19/2011	N/A	gw_owrb_aquifers.shp	
City/Town	U.S. Census Bureau	1/1/2010	N/A	tl_2010_40_place10	

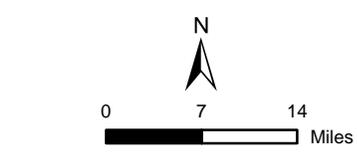
Data Layer	Source	Date from Metadata	Date Received from Ft. Sill	Feature Name	Notes
Aerial Spraying Region of Influence (ROI)	URS	3/16/2016	N/A	installation_area_buffer	
Environmental Justice Region of Influence (ROI)	URS	3/29/2016	N/A	ROI_EJ	
Fast Moving Fire Risk Area	URS	3/31/2015	2014	PotentialEnvHazardSourcePoint_A	
Fast Moving Fire Risk Area (centerpoint)	URS	3/31/2015	2014	PotentialEnvHazardSourcePoint	
Firebreak Buffer (40-foot corridor)	URS	3/14/2016	2014	proposed_firebreak_centerline_buffers	
Firebreak ROI	URS	3/14/2016	N/A	Firebreak_Buffers1mile	
General Region of Influence (ROI)	URS	3/16/2016	N/A	ProjectReference	
Tracer Round Risk Area	URS	3/31/2015	2014	PotentialEnvHazardSourcePoint_A	
Tracer Round Risk Area (centerpoint)	URS	3/31/2015	2014	PotentialEnvHazardSourcePoint	
WVRA ROI	URS	9/1/2015	N/A	WVRA_buffer	
National Wildlife Refuge	USFWS	5/1/2011	N/A	FwsApproved	
City Points	USGS	12/4/2012	N/A	citiesx010g	
County Boundary	USGS	12/4/2012	N/A	countyp010g	
Highway	USGS	12/4/2012	N/A	roadtri010g	
Major River	USGS	12/4/2012	N/A	streaml010g	
Major Water Bodies	USGS	12/4/2012	N/A	wtrbdyp010g	
State Boundary	USGS	12/4/2012	N/A	statesp010g	
Land Cover	USGS NLCD	2011	N/A	nlcd_ok_utm14.tif	

N/A – Not applicable.

## CHAPTER 8 FIGURES



Sources:  
 Fort Sill, 2016: Installation  
 USFWS, 2011: National Wildlife Refuge  
 USGS National Map, 2010:  
 State, County, City, Highway, Water



- Legend**
- Fort Sill
  - National Wildlife Refuge
  - State Boundary
  - County Boundary
  - City
  - Highway
  - Major River

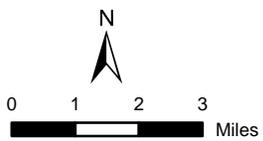
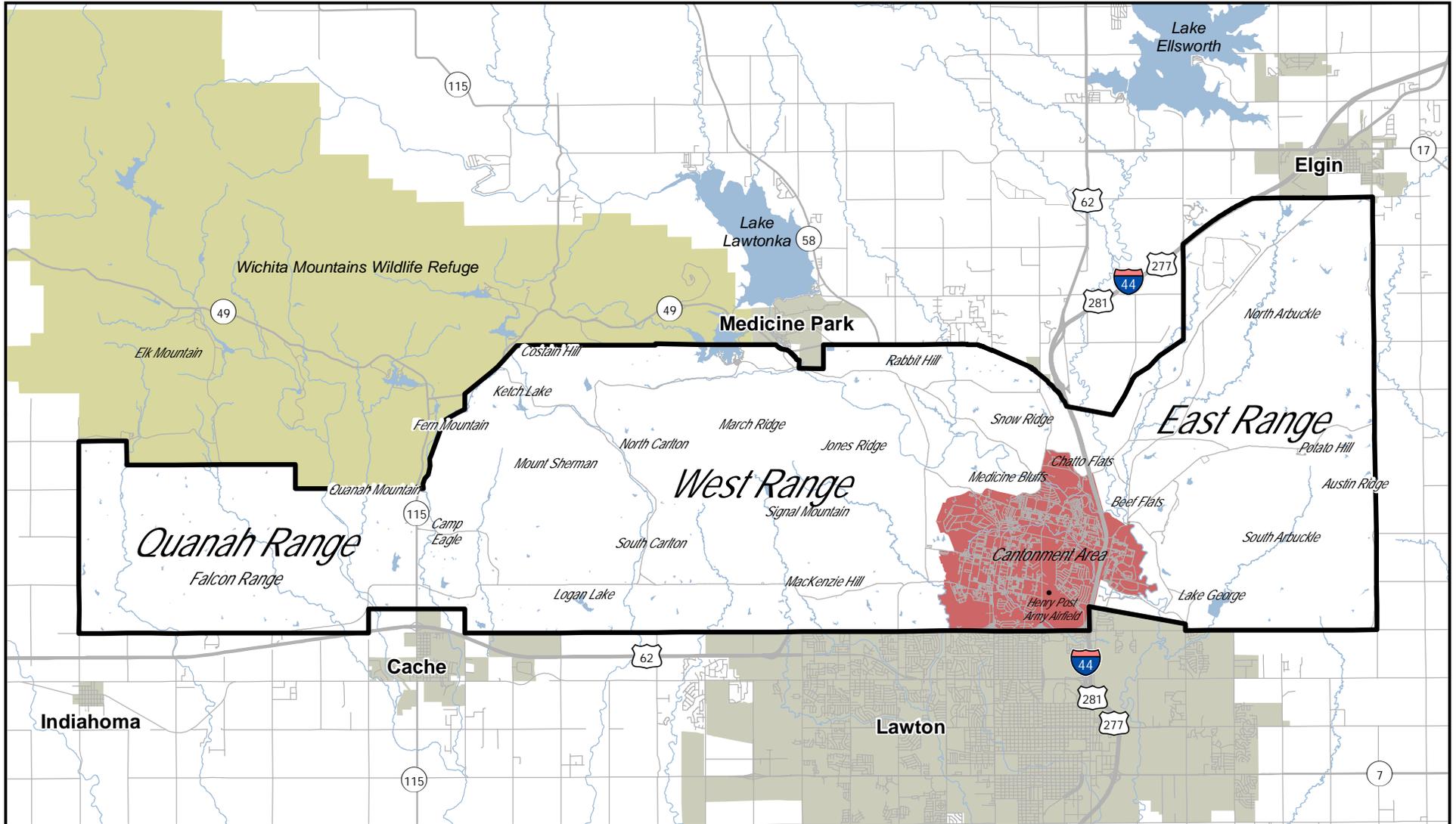
**Location of  
Fort Sill**

DRAFT  
ENVIRONMENTAL ASSESSMENT

Date: 4/1/2016 Figure 1.1-1

File: L:\AGE\Projects\ENV\USACE\OIA\_Systems\W912B-10-D-2013\TO\_0003 - Ft.Sill LF Eval\GIS\MXD\EA\_Draft\Fig111\_Location.mxd

**URS**  
 9400 Amberglen Blvd.  
 Austin, TX 78729  
 Phone: (512) 454-4797  
 www.urs.com

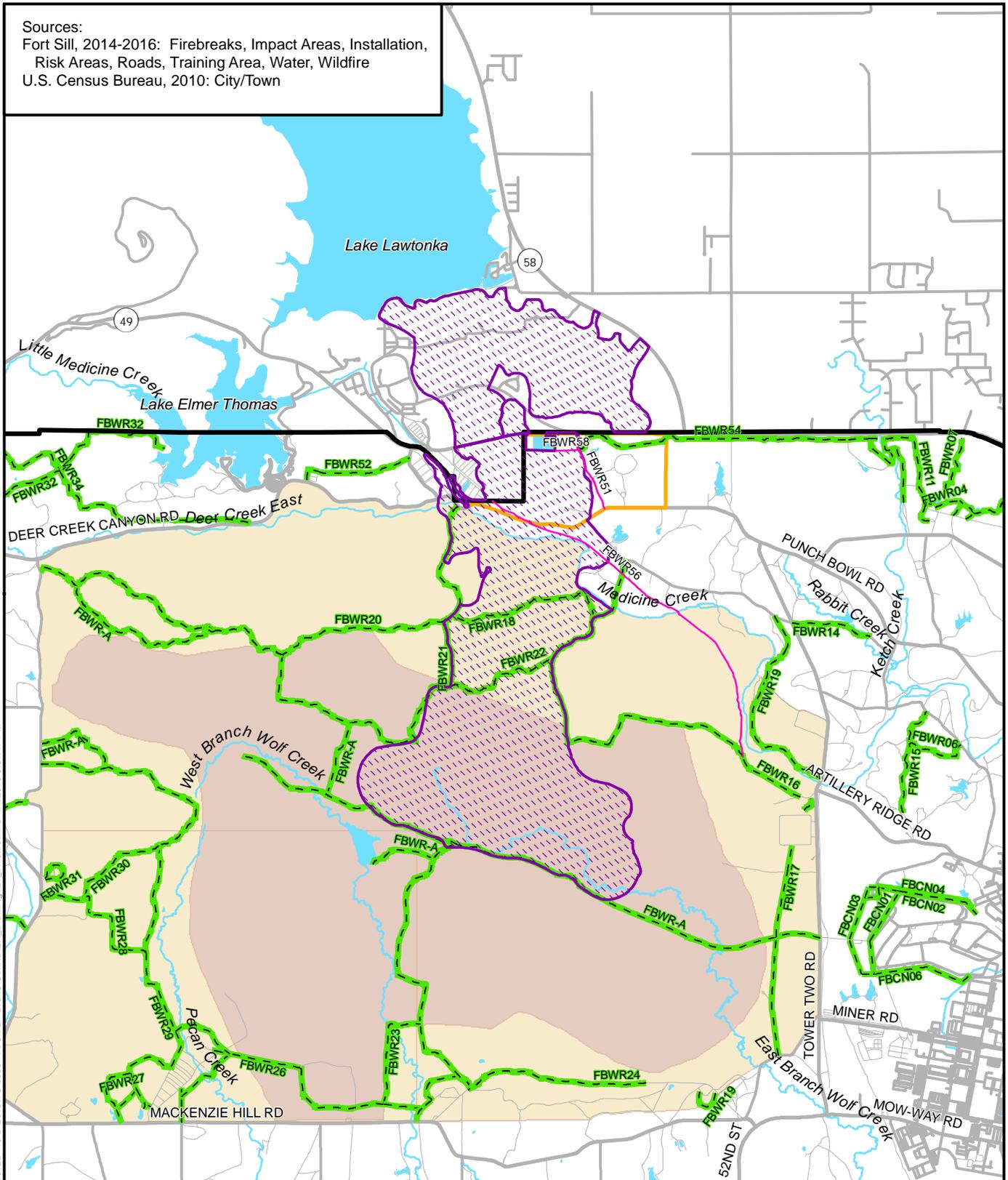


- Legend**
- Fort Sill
  - City/Town
  - National Wildlife Refuge
  - Cantonment Area
  - Road
  - Water

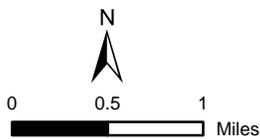
Sources:  
 Fort Sill, 2014-2016: Cantonment, Installation, Ranges, Roads, Water  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

**Installation Ranges and Cantonment Area**  
 DRAFT ENVIRONMENTAL ASSESSMENT

Sources:  
 Fort Sill, 2014-2016: Firebreaks, Impact Areas, Installation,  
 Risk Areas, Roads, Training Area, Water, Wildfire  
 U.S. Census Bureau, 2010: City/Town



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**Legend**

- Approximate Extent of Medicine Park Wildfire (June 2011)
- Proposed Firebreak
- Existing Firebreak
- Training Area 39
- Impact Area Dudded
- Impact Area Non-Dudded
- Fort Sill
- Road
- Water

**Approximate Extent of  
 Medicine Park Wildfire  
 (June 2011)**

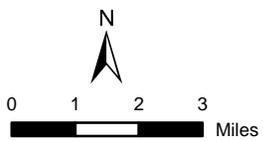
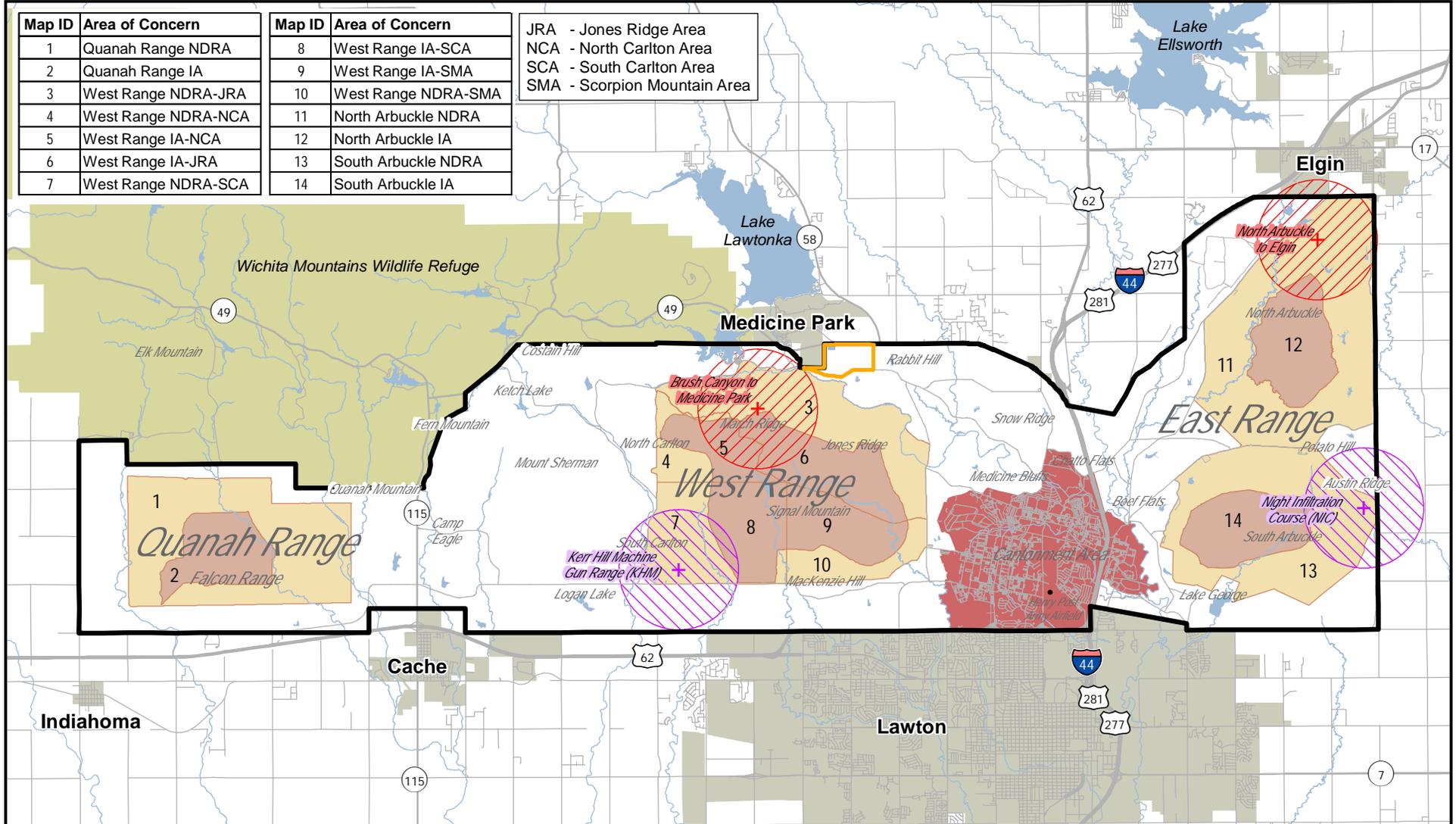
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Date: 4/1/2016

Figure 1.2-1

Map ID	Area of Concern	Map ID	Area of Concern
1	Quanah Range NDRA	8	West Range IA-SCA
2	Quanah Range IA	9	West Range IA-SMA
3	West Range NDRA-JRA	10	West Range NDRA-SMA
4	West Range NDRA-NCA	11	North Arbuckle NDRA
5	West Range IA-NCA	12	North Arbuckle IA
6	West Range IA-JRA	13	South Arbuckle NDRA
7	West Range NDRA-SCA	14	South Arbuckle IA

JRA - Jones Ridge Area  
 NCA - North Carlton Area  
 SCA - South Carlton Area  
 SMA - Scorpion Mountain Area



**Legend**

- Fort Sill
- City/Town
- National Wildlife Refuge
- Cantonment Area
- Road
- Water

**Areas of Concern**

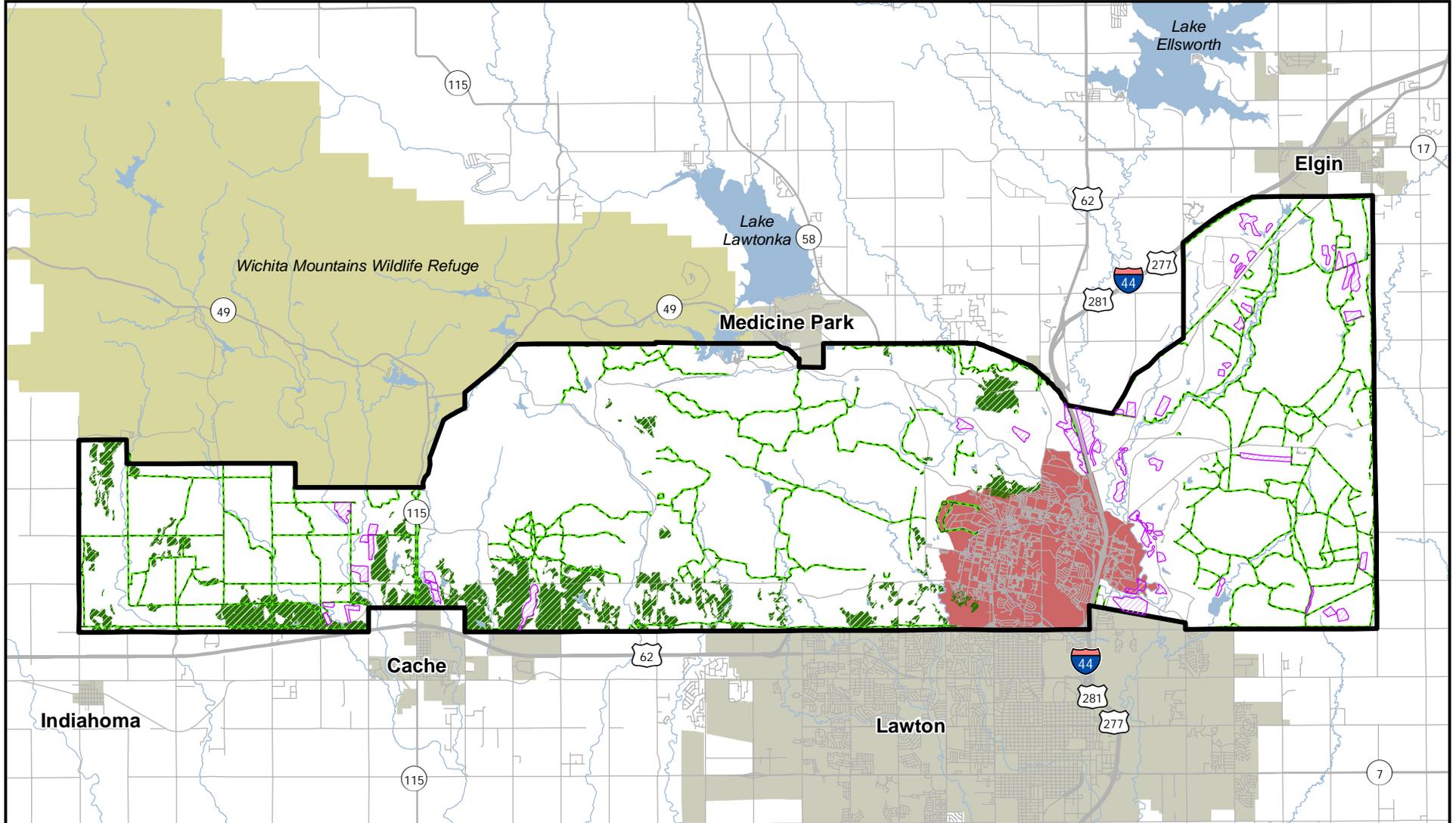
- Training Area 39
- Dudded Impact Area (IA)
- Non-Dudded Range Area (NDRA)
- Fast Moving Fire Risk Area
- Tracer Round Risk Area

**Sources:**  
 Fort Sill, 2014-2016:  
 Cantonment, Impact Areas,  
 Installation, Ranges, Risk  
 Areas, Roads, Water  
 U.S. Census Bureau, 2010:  
 City/Town  
 USFWS, 2011: National Wildlife  
 Refuge

**Areas of Concern**

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Date: 4/5/2016      Figure 1.2-2



N

0 1.5 3  
Miles

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**Legend**

- Fort Sill
- City/Town
- National Wildlife Refuge
- Cantonment Area
- Road
- Water

**Components of the No Action Alternative**

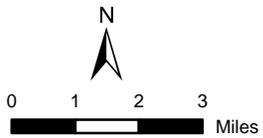
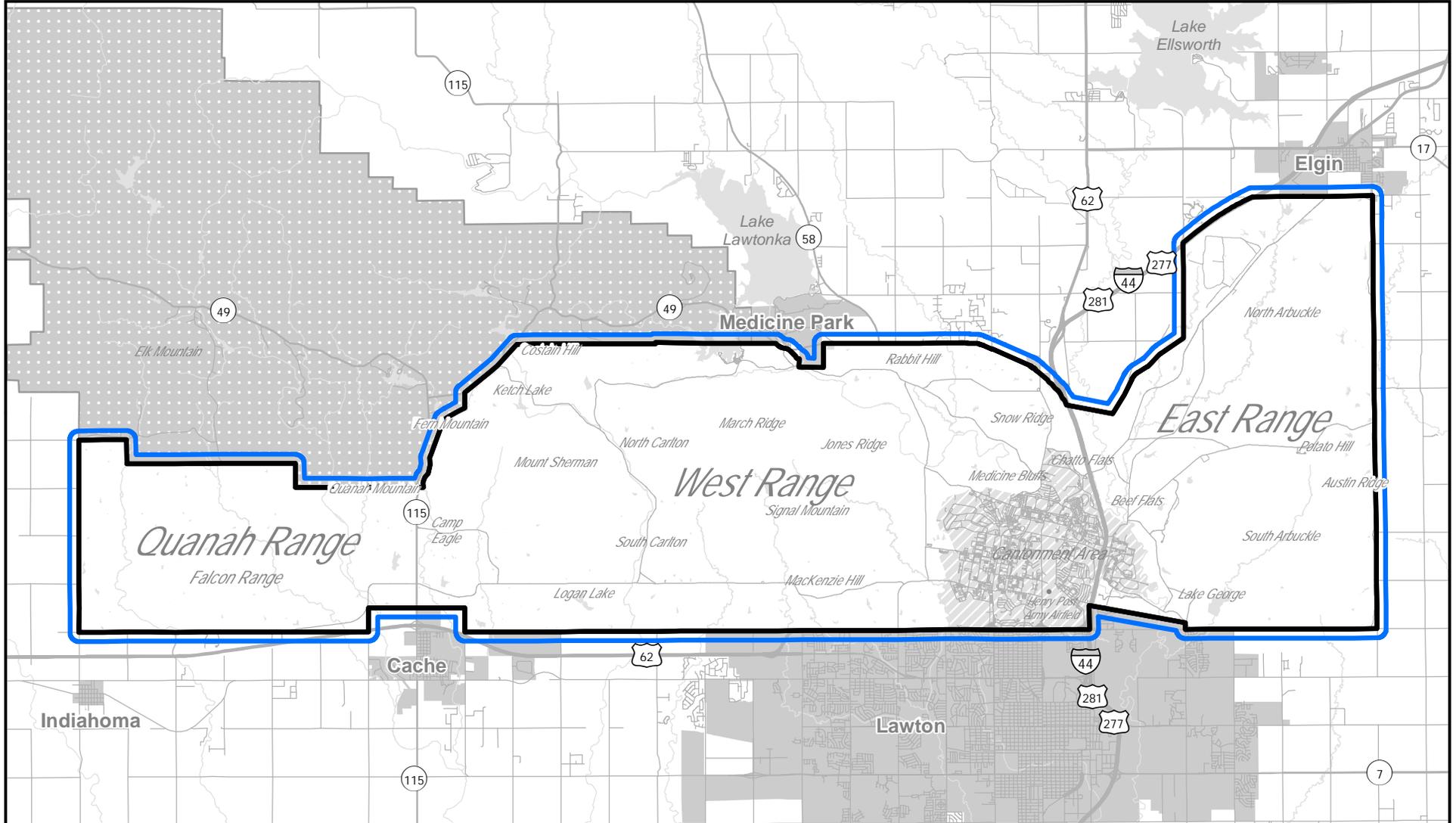
- Mesquite savanna (MS)
- Existing Firebreak
- Agricultural Lease

Sources:  
 Fort Sill, 2014-2016: Installation, Roads, Water, Cantonment, Impact Areas, Risk Areas  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

**Components of the No Action Alternative**

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 ENVIRONMENTAL ASSESSMENT

Date: 4/1/2016	Figure 2.2-1
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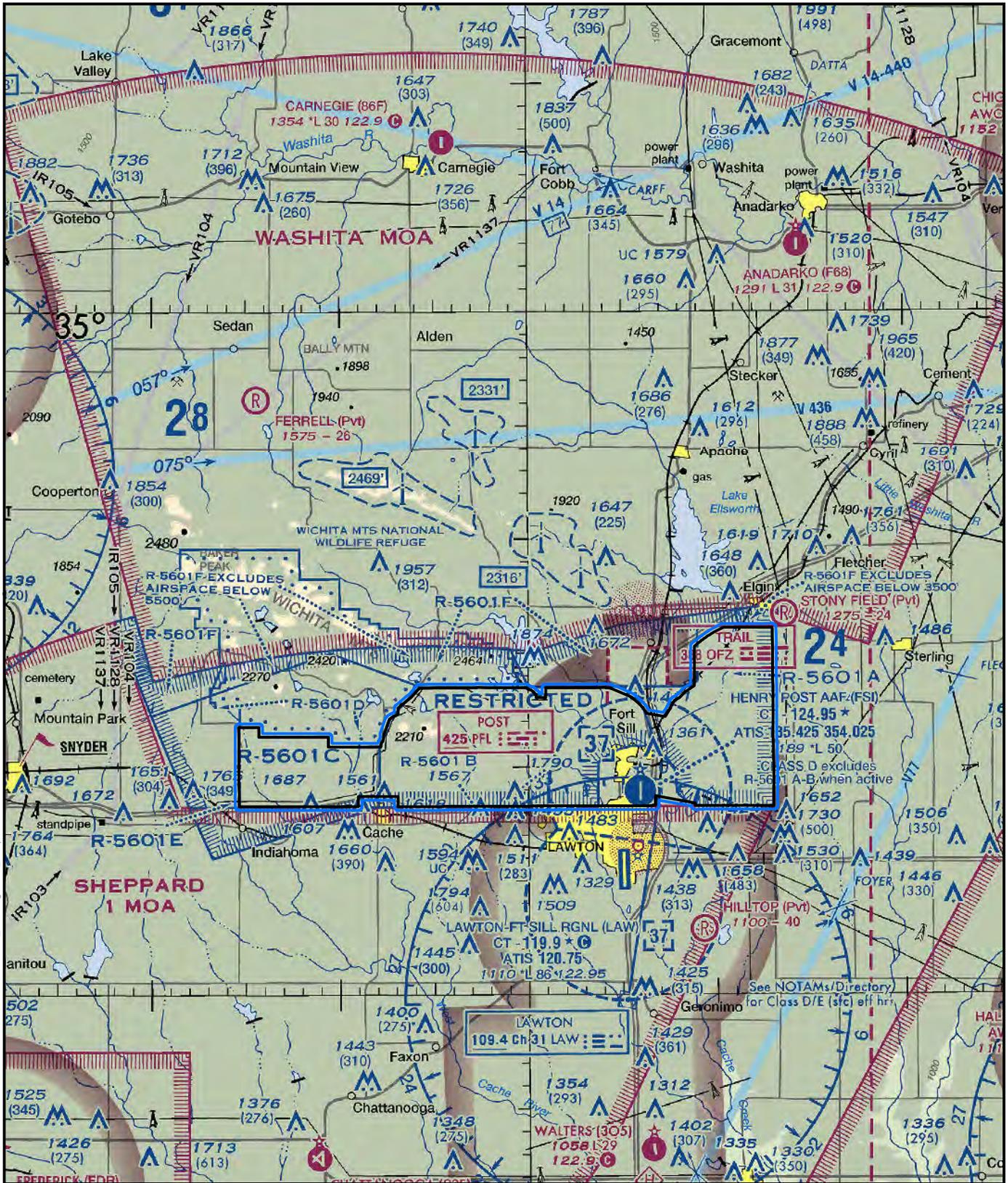


- Legend**
- General Region of Influence (ROI)
  - Fort Sill
  - City/Town
  - National Wildlife Refuge
  - Cantonment Area
  - Road
  - Water

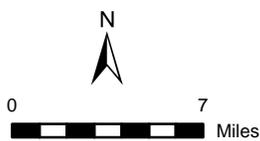
**Sources:**  
 Fort Sill, 2014-2016: Cantonment, Installation, Ranges, Roads, Water  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge  
 URS, 2016: ROI

**General Region of Influence (ROI)**  
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Date: 4/4/2016      Figure 3.1-1



File: L:\AGE\Projects\ENVUS\ACE\OA\_Systems\W912B-10-D-2013\TO\_0003 - Ft. Sill LF Eval\GIS\MXD\EA\_Draft\Fig3.2-1a\_AirSpace.mxd



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**Legend**  
 General Region of Influence (ROI)  
 Fort Sill

**Sources:**  
 FAA, 3/15/2015:  
 Aeronautical Chart  
 Fort Sill, 2016: Installation  
 URS, 2016: ROI

**Air Space**  
 DRAFT  
 ENVIRONMENTAL ASSESSMENT

Date: 4/4/2016 Figure 3.2-1a



# DALLAS - FT. WORTH LEGEND



Published by the U.S. Department of Transportation  
Federal Aviation Administration  
Aeronav Products  
http://aeronav.faa.gov

Airports having Control Towers are shown in Blue, all others in Magenta. Consult Airport/Facility Directory (A/FD) for details involving airport lighting, navigation aids, and services. All times are local. For additional symbol information refer to the Chart User's Guide.

### AIRPORTS

- Other than hard-surfaced runways
- Hard-surfaced runways 1500 ft. to 8000 ft. in length
- Hard-surfaced runways greater than 8000 ft. or some multiple runways less than 8000 ft.
- Open dot within hard-surfaced runway configuration indicates approximate VOR, VOR-DME, or VORTAC location.

All recognizable hard-surfaced runways, including those closed, are shown for visual identification. Airports may be public or private.

### ADDITIONAL AIRPORT INFORMATION

- Private (Pvt) - Non-public use having emergency or landmark value
- Military - Other than hard-surfaced; all military airports are identified by abbreviations AFD, NAS, AAF, etc. DoD users, for complete airport information consult DoD FLIP.
- Unverified
- Abandoned - paved having landmark value, 3000 ft. or greater
- Ultraflight Flight Park Selected
- Seaplane Base
- Heliport Selected

Services - fuel available and field tended during normal working hours depicted by use of ticks around basic airport symbol. (Normal working hours are Mon thru Fri 10:00 A.M. to 4:00 P.M.) Consult A/FD for service availability at airports with hard-surfaced runways greater than 8000 ft.

★ Rotating airport beacon in operation Sunsets to Sunrise

OBJECTIONABLE - Airport may adversely affect airspace use.

### AIRPORT DATA

Box Indicates FAR 93 Special Air Traffic Rules & Airport Traffic Patterns.

Runways with Right Traffic Patterns (public use)

RP # Special conditions exist - see A/FD.

FSS - Flight Service Station

NO SVFR - Fixed-wing special VFR flight is prohibited.

CT - 110.3 - Control Tower (CT) - primary frequency

★ - Star indicates operation part-time. See tower frequency tabulation for hours of operation.

① - Follows the Common Traffic Advisory Frequency (CTAF)

ATIS 123.8 - Automatic Terminal Information Service

ASOS/AWOS 135.42 - Automated Surface Weather Observing Systems (shown where full-time ATIS not available). Some ASOS/AWOS facilities may not be located at airports.

UNICOM - Aeronautical advisory station

VFR Advy - VFR Advisory Service shown where full-time ATIS not available and frequency is other than primary CT frequency.

285 - Elevation in feet

L - Lighting in operation Sunset to Sunrise

\*L - Lighting limitations exist; refer to Airport/Facility Directory.

72 - Length of longest runway in hundreds of feet; usable length may be less.

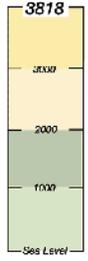
When information is lacking, the respective character is replaced by a dash. Lighting codes refer to runway edge lights and may not represent the longest runway or full length lighting.

Lambert Conformal Conic Projection Standard Parallels 33° 20' and 38° 40'  
Horizontal Datum: North American Datum of 1983 (World Geodetic System 1984)

CONTOUR INTERVAL 500 feet

HIGHEST TERRAIN elevation is 3818 feet  
located at 34° 52'N - 101° 59'W

Spot elevation . . . . . 4254  
Approximate elevation . . . . . x 3200



### AIRPORT TRAFFIC SERVICE AND AIRSPACE INFORMATION

Only the controlled and reserved airspace effective below 18,000 ft. MSL are shown on this chart.

- Class B Airspace
- Class C Airspace (Mode C - see FAR 91.215(A)(1))
- Class D Airspace
- Class E (f) Airspace
- Class E Airspace with floor 700 ft. above surface that laterally abuts Class G Airspace.
- Class E Airspace with floor 700 ft. above surface that laterally abuts 1200 ft. or higher Class E Airspace
- Class E Airspace with floor 1200 ft. or greater above surface that laterally abuts Class G Airspace

2400 MSL Differentiates floors of Class E Airspace greater than 700 ft. above surface.

4500 MSL

Class E Airspace exists at 1200' AGL unless otherwise designated as shown above.

Class E Airspace low altitude Federal Airways are indicated by center line.

Intersection - Arrows are directed towards facilities which establish intersection.

132° → V 69

Total mileage between NAVAIDs on direct Airways

Class E Airspace low altitude RNAV 2 Routes are indicated by center line.

T 319 TK 313

RNAV Waypoint

Prohibited, Restricted, and Warning Areas; Canadian Advisory, Danger, and Restricted Areas

Alert Area and MOA - Military Operations Area

Special Airport Traffic Area (See FAR 93 for details.)

ADIZ - Air Defense Identification Zone

MODE C (See FAR 91.215(A)(1))

National Security Areas

Terminal Radar Service Area (TRSA)

MTR - Military Training Route

IR211

### COMMUNICATION BOXES

122.1R 122.6 123.6

OAKDALE OAK

CHICAGO CHI

Underline indicates no voice on frequency.

Heavy line box indicates Flight Service Station (FSS). Frequencies 121.5, 122.2, 243.0 and 256.4 (Canada - 121.5, 126.7 and 243.0) are available at many FSSs and are not shown above boxes. All other frequencies are shown.

Contain FSSs provide Airport Advisory Service, see A/FD.

R - Receive only

Frequencies above this line box are remote to NAVAID site. Other FSS frequencies providing voice communication may be available as determined by altitude and terrain. Consult Airport/Facility Directory for complete information.

MIAMI

122.1R

FSS radio providing voice communication

### RADIO AIDS TO NAVIGATION

VHF OMNI RANGE (VOR)

VORTAC

Non-Directional Radio Beacon (NDB)

VOR-DME

Other facilities, i.e., FSS Outlet, RCO, etc.

NDB - DME

### OBSTRUCTIONS

1000 ft and higher AGL

Below 1000 ft AGL

Wind Turbine

Group Obstruction

Obstruction with high-intensity lights; may operate part-time

Wind Turbine Farm

Elevation of the top above mean sea level

Height above ground

Under construction or reported; position and elevation unverified

NOTICE: Guy wires may extend outward from structures.

2894' UC

2049 (1149) UC

### MISCELLANEOUS

Hang Glider Activity

Ultraflight Activity

Parachute Jumping Area (See Airport/Facility Directory.)

VPXYZ

VFR Waypoints (See chart tabulation for latitude/longitude.)

NAME (VPXYZ)

Marine Light

Isogonic Line (2010 VALUE)

### TOPOGRAPHIC INFORMATION

Power Transmission Line

Mountain Pass

Aerial Cable

11823 (Elevation of Pass)

Lookout Tower

678 (Elevation Base of Tower)

Pass symbol does not indicate a recommended route or direction of flight and pass elevation does not indicate a recommended clearance altitude. Hazardous flight conditions may exist within and near mountain passes.

### ATTENTION

THIS CHART CONTAINS MAXIMUM ELEVATION FIGURES (MEF). The Maximum Elevation Figures shown in quadrangles bounded by ticked lines of latitude and longitude are represented in THOUSANDS and HUNDREDS of feet above mean sea level. The MEF is based on information available concerning the highest known feature in each quadrangle, including terrain and obstructions (trees, towers, antennas, etc.).

Example: 12,500 feet . . . . . 125

94<sup>TH</sup> EDITION EFFECTIVE 0901Z 5 MAR 2015 TO 0901Z 17 SEP 2015

Includes airspace amendments effective 5 MAR 2015 and all other aeronautical data received by 8 JAN 2015

## Air Space Legend

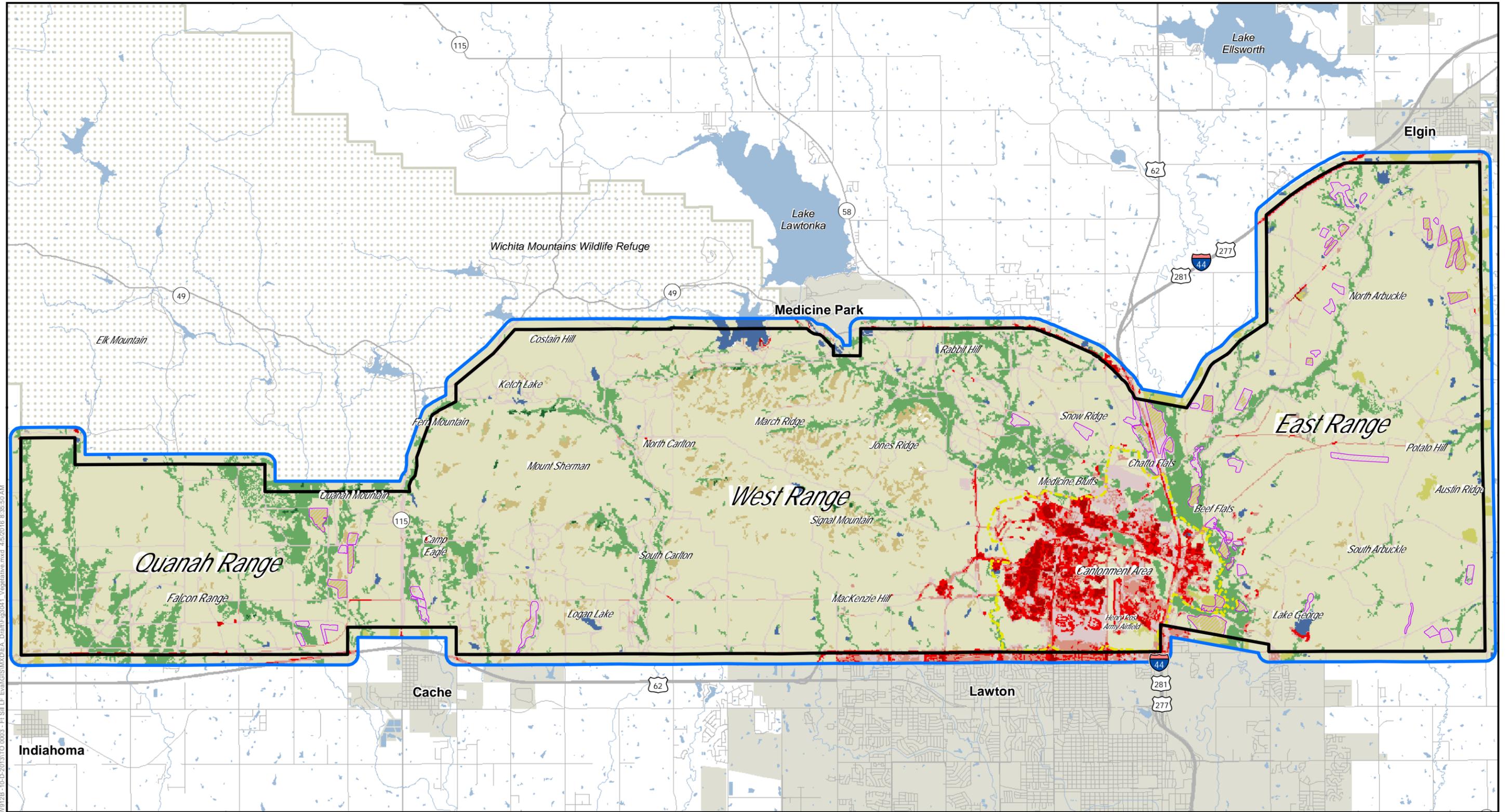
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Date: 4/4/2016

Figure 3.2-1b

Information on this chart will change; consolidated updates of chart changes are available every 56 days in the AIRPORT/FACILITY DIRECTORY Chart Bulletin section (online at http://aeronav.faa.gov). Also consult appropriate NOTICES TO AIRMEN (NOTAMS) and other FLIGHT INFORMATION PUBLICATIONS (FLIPs) for the latest changes.

File: L:\AGE\Projects\ENVUSACE\A Systems\W912B-10-D-2013\TO 0003 - FLSI LE Evt\GIS\IMXD\EA\_Draft\Fig021b-AirSpaceLegend.mxd 3/22/2016 1:26:54 PM



File: L:\AEG\Projects\ENV\SACE\DOA\Systema\W912B-10-D-2013\TO\_0003 - Ft. Sill LF Eval\GIS\MXD\IEA\_Draft\Fig3.4-1\_Vegetative.mxd 4/5/2016 8:35:50 AM

0 1.75 Miles

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**Legend**

- General Region of Influence (ROI)
- Fort Sill
- City/Town
- Cantonment Area
- National Wildlife Refuge
- Road
- Water
- Agricultural Lease

**Land Cover**

<span style="background-color: #c0c0c0; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Shrub/Scrub	<span style="background-color: #008000; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Evergreen Forest	<span style="background-color: #ff0000; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Developed, High Intensity
<span style="background-color: #0000ff; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Open Water	<span style="background-color: #4682b4; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Emergent Herbaceous Wetlands	<span style="background-color: #008000; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Deciduous Forest
<span style="background-color: #90ee90; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Mixed Forest	<span style="background-color: #d3d3d3; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Developed, Open Space	<span style="background-color: #90ee90; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Cultivated Crops
<span style="background-color: #e0e0e0; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Herbaceous	<span style="background-color: #ff0000; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Developed, Medium Intensity	<span style="background-color: #808080; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Barren Land
<span style="background-color: #ffff00; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Hay/Pasture	<span style="background-color: #a52a2a; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Developed, Low Intensity	

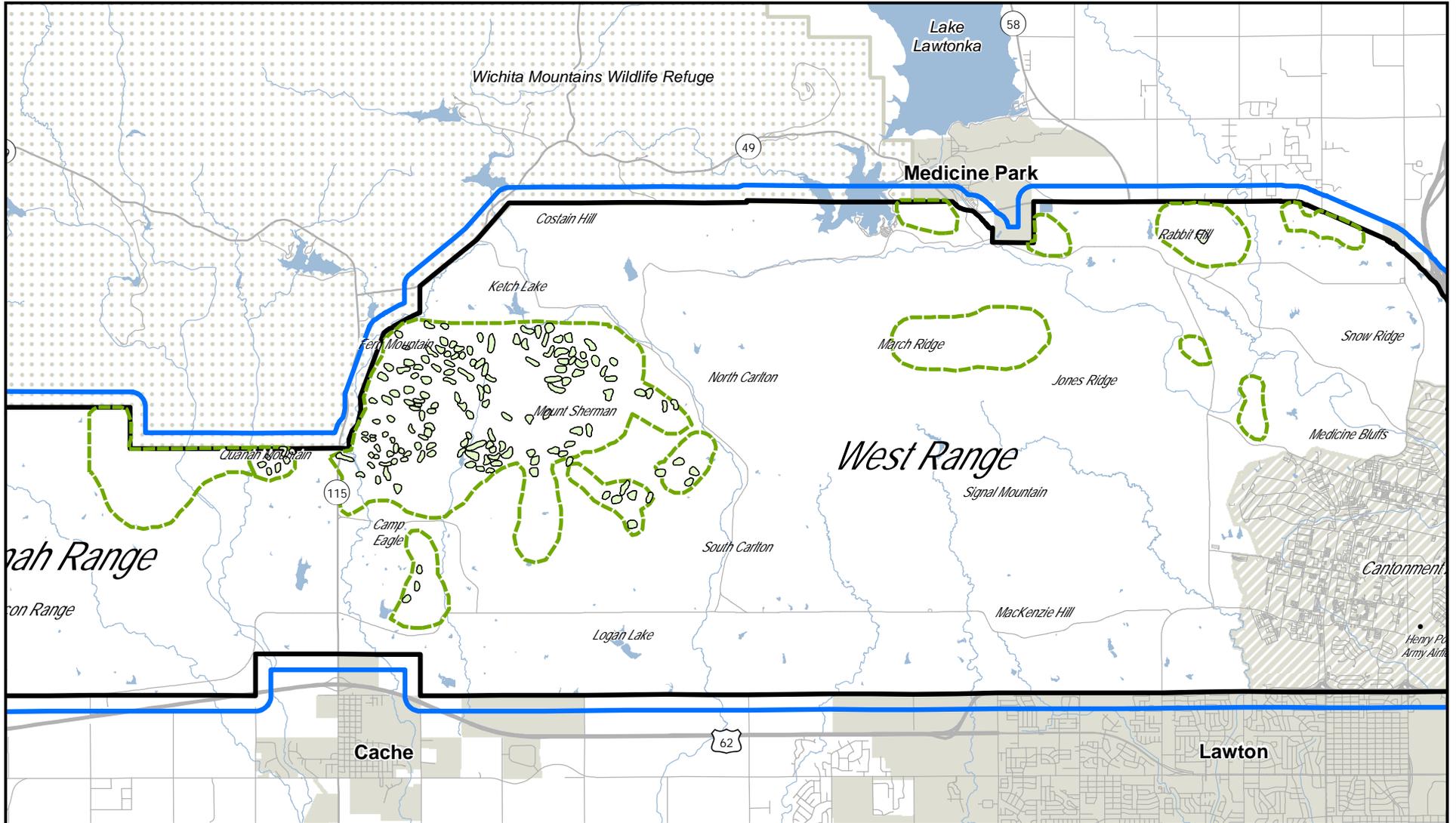
NOTE: USGS NLCD data are a visual interpretation of aerial photography. They are generalized and not intended to be 100% accurate.

**Sources:**  
Fort Sill, 2014-2016: Cantonment, Firebreaks, Installation, Ranges, Roads, Water, Agricultural Leases  
U.S. Census Bureau, 2010: City/Town  
USFWS, 2011: National Wildlife Refuge  
FEMA, 2015: Floodplain  
URS, 2016: ROI  
USGS NLCD, 2011: Land Cover

**Vegetation Types within Fort Sill**

DRAFT ENVIRONMENTAL ASSESSMENT

Date: 4/5/2016	Figure 3.4-1
----------------	--------------



  
  
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**Legend**

 General Region of Influence (ROI)	 Road
 Fort Sill	 Water
 City/Town	 Black-capped Vireo Nesting Area
 Cantonment Area	 Fauna Study Area
 National Wildlife Refuge	

**Sources:**  
 Fort Sill, 2014-2016: Cantonment, Installation, Ranges, Roads, Water, Black-capped Vireo  
 U.S. Census Bureau, 2010: City/Town  
 URS, 2016: ROI  
 USFWS, 2011: National Wildlife Refuge

**Black-Capped Vireo Nesting**  
 DRAFT ENVIRONMENTAL ASSESSMENT

Date: 4/5/2016	Figure 3.4-2
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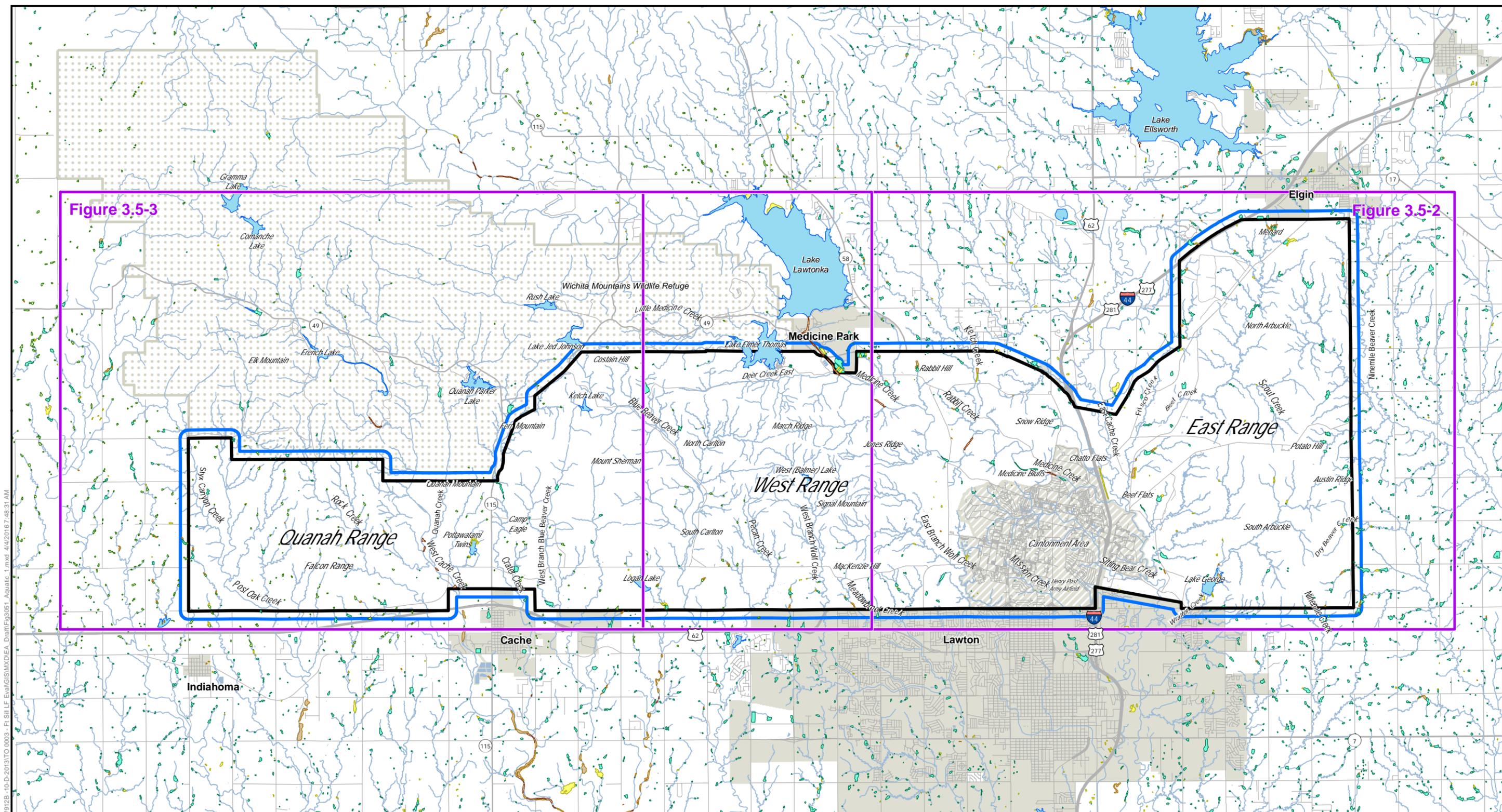


Figure 3.5-3

Figure 3.5-2

File: L:\AGE\Projects\ENVUSACE\DOA\Systema\W912B-10-D-2013\TO 0003 - Ft. Sill LF Eval\GIS\MXD\DEA\_Draft\Fig3.5-1\_Aquatic\_1.mxd 4/4/2016 7:48:31 AM

0 2.2 Miles

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**Legend**

- General Region of Influence (ROI)
- Fort Sill
- City/Town
- Cantonment Area
- National Wildlife Refuge
- Road
- Water Body
- Stream

**NWI Wetlands:**

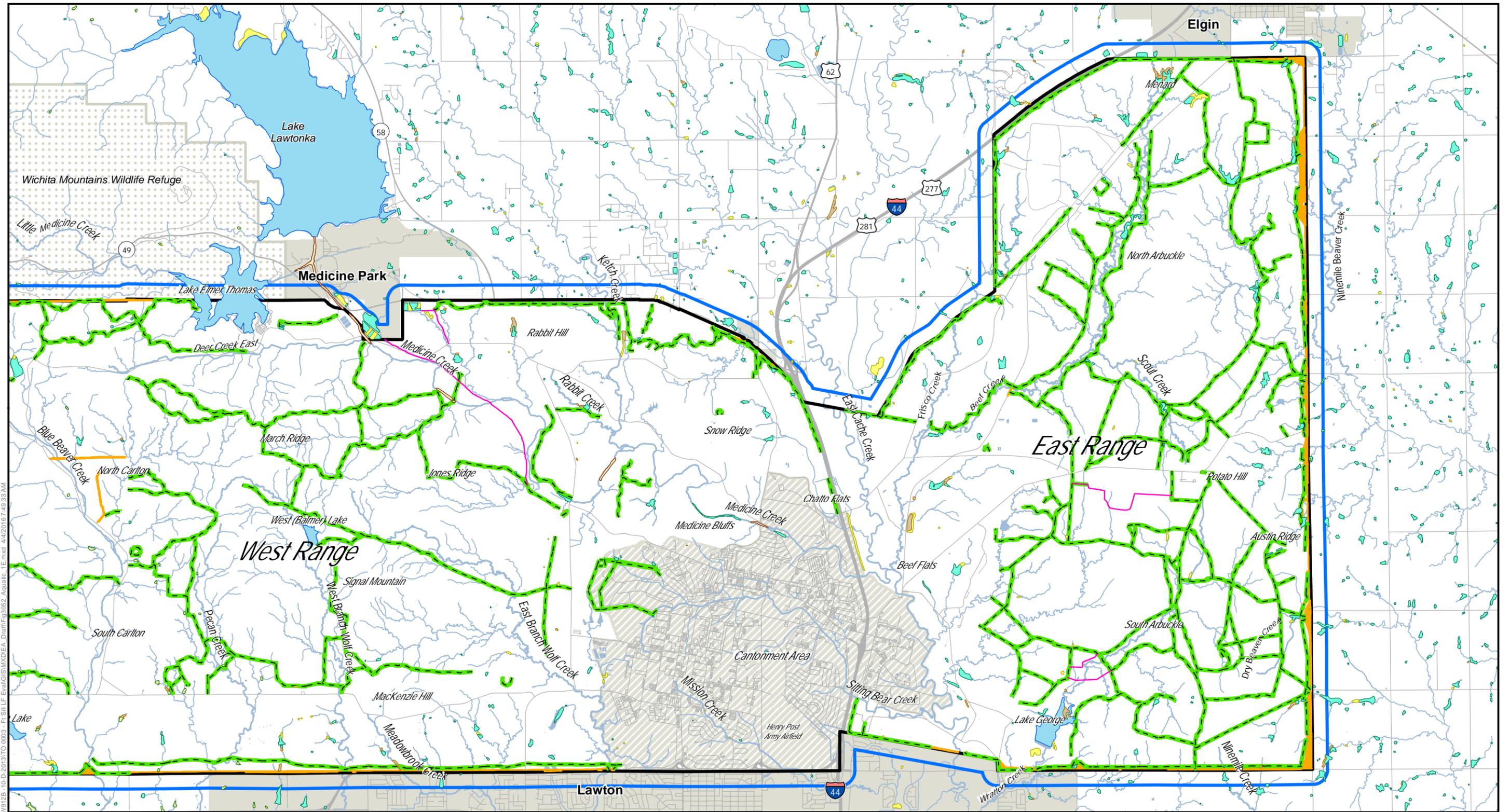
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

**Sources:**  
Fort Sill, 2014-2016:  
Cantonment, Firebreaks, Installation,  
Ranges, Roads, Water, Streams  
U.S. Census Bureau, 2010:  
City/Town  
URS, 2016: ROI  
USFWS, 2011: National Wildlife  
Refuge  
USFWS, 1983-84: NWI Wetlands

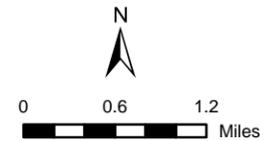
**Aquatic Habitat**

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Date: 4/4/2016	Figure 3.5-1
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File: L:\AEG\Projects\ENV\SAC\EOA\Systema\W912B-10-D-2013\TO 0003 - Ft. Sill LF Eval\GIS\MXD\EA\_Draft\Fig052\_Aquatic\_1E.mxd 4/4/2016 7:49:33 AM



**Legend**

- General Region of Influence (ROI)
- Fort Sill
- Proposed Firebreak
- Existing Firebreak
- Woody Vegetation Removal Area
- City/Town

- Cantonment Area
- National Wildlife Refuge
- Road
- Water Body
- Stream

**NWI Wetlands:**

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

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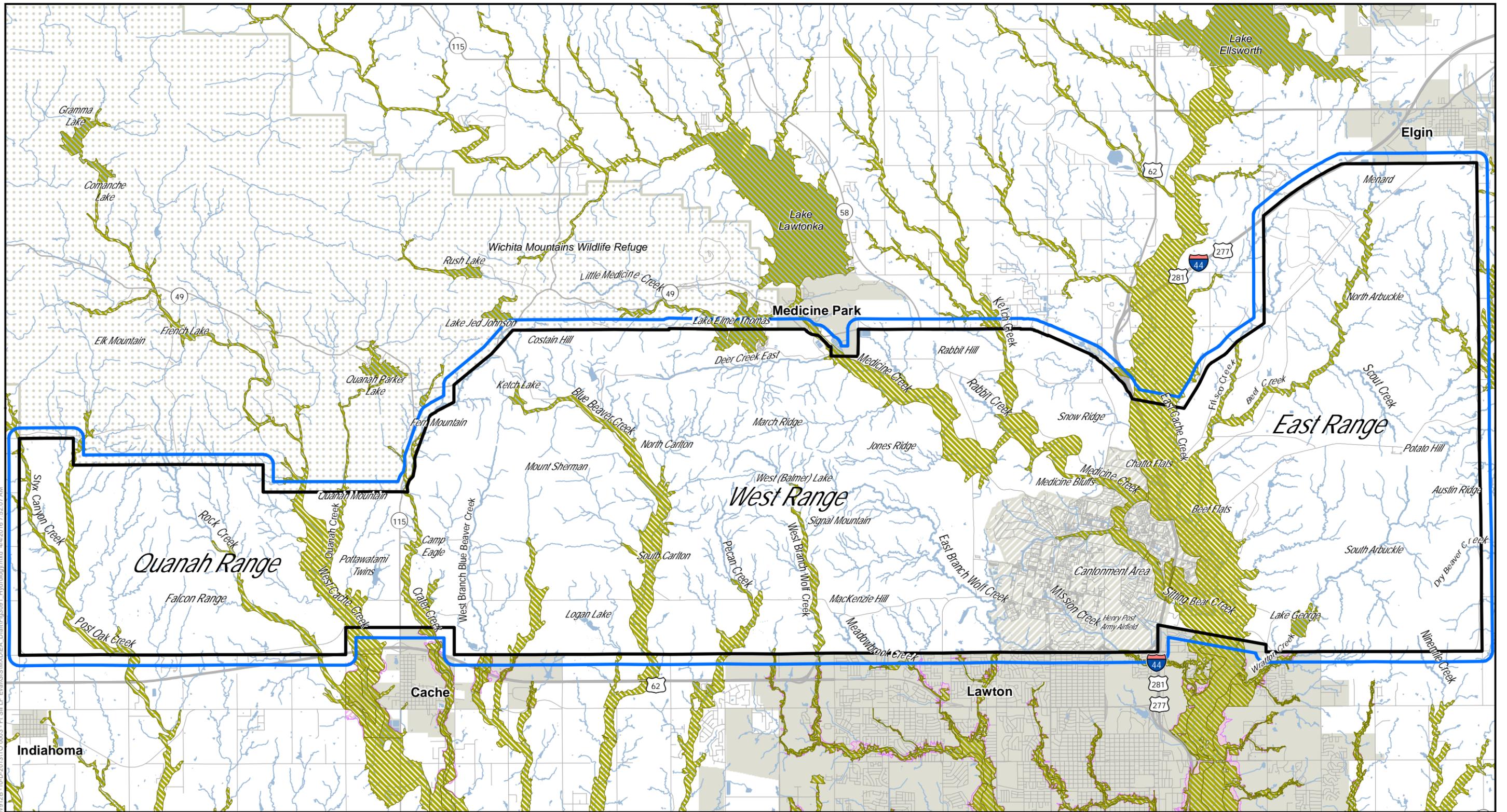
Sources:  
 Fort Sill, 2014-2016:  
 Cantonment, Firebreaks, Installation,  
 Ranges, Roads, Water, Streams  
 U.S. Census Bureau, 2010:  
 City/Town  
 URS, 2016: ROI  
 USFWS, 2011: National Wildlife  
 Refuge  
 USFWS, 1983-84: NWI Wetlands

**Aquatic Habitat  
(East)**

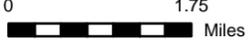
DRAFT  
 ENVIRONMENTAL ASSESSMENT

Date: 4/4/2016	Figure 3.5-2
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File: L:\AGE\Projects\ENVUS\ACE\EOA Systems\W912B-10-D-2013\TO 0003 - Ft. Sill LF Eval\GIS\MXD\DEA\_Draft\Fig3.9-1\_Hydrology.mxd 4/4/2016 7:52:07 AM

  
 0 1.75 Miles  
  
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**Legend**

 General Region of Influence (ROI)	 Road	 100-Year Floodplain
 Fort Sill	 Water	 500-Year Floodplain
 City/Town	 Stream	
 Cantonment Area		
 National Wildlife Refuge		

**Sources:**  
 Fort Sill, 2014-2016:  
 Cantonment, Firebreaks, Installation,  
 Ranges, Roads, Water, Streams  
 URS, 2016: ROI  
 U.S. Census Bureau, 2010:  
 City/Town  
 USFWS, 2011: National Wildlife  
 Refuge  
 FEMA, 2009, 2013: Floodplain

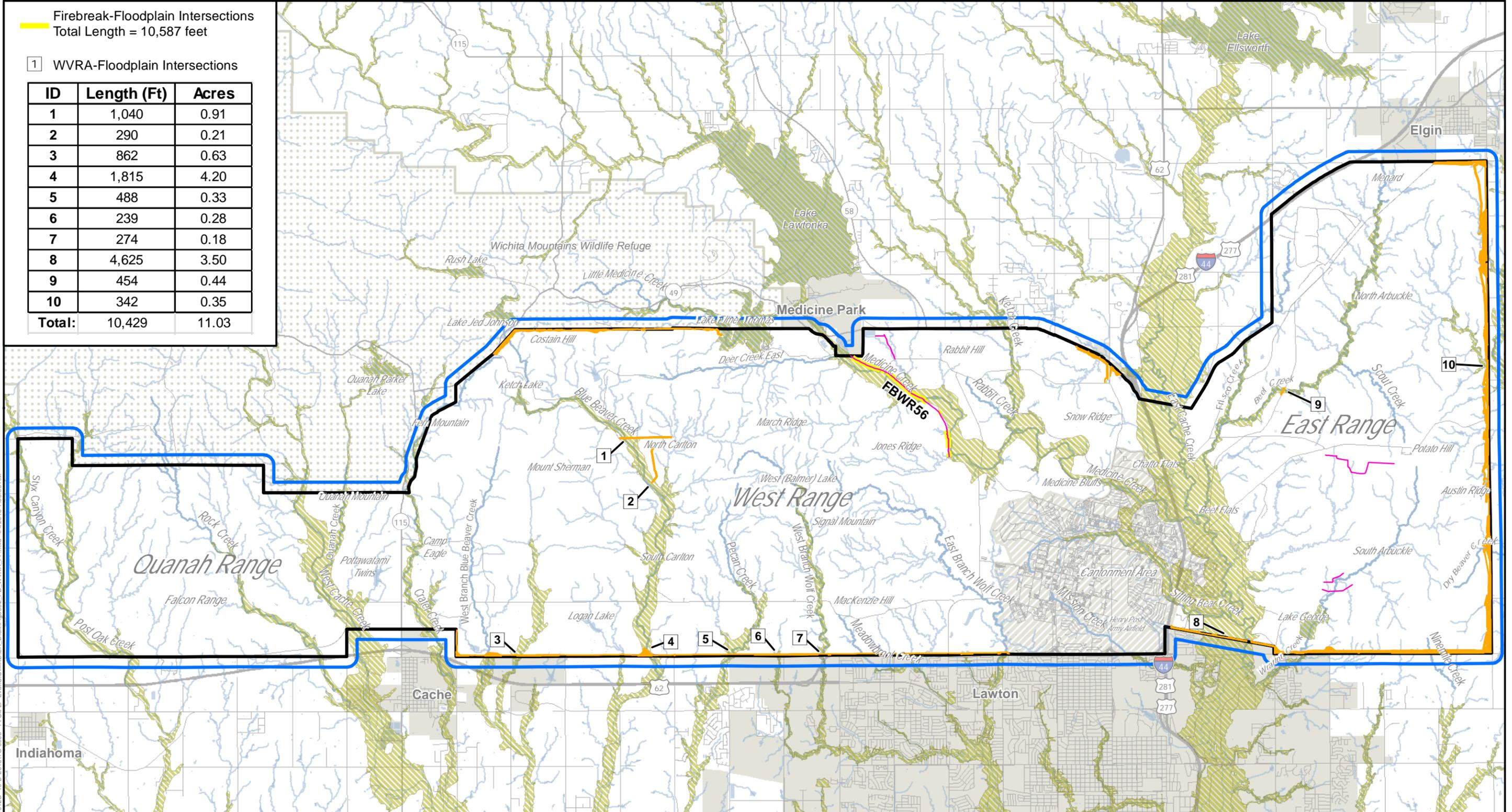
**Hydrology and Hydraulics**  
 DRAFT  
 ENVIRONMENTAL ASSESSMENT

Date: 4/4/2016	Figure 3.9-1
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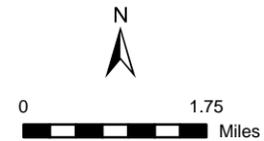
Firebreak-Floodplain Intersections  
Total Length = 10,587 feet

1 WVRA-Floodplain Intersections

ID	Length (Ft)	Acres
1	1,040	0.91
2	290	0.21
3	862	0.63
4	1,815	4.20
5	488	0.33
6	239	0.28
7	274	0.18
8	4,625	3.50
9	454	0.44
10	342	0.35
<b>Total:</b>	<b>10,429</b>	<b>11.03</b>



File: L:\AGE\Projects\ENVUS\ACED\A Systems\W912B-10-D-2013\TO 0003 - Ft. Sill LF Eval\GIS\MXD\DEA\_Draft\Fig092.FB.WVRA.FP.mxd 4/4/2016 7:53:53 AM



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Legend

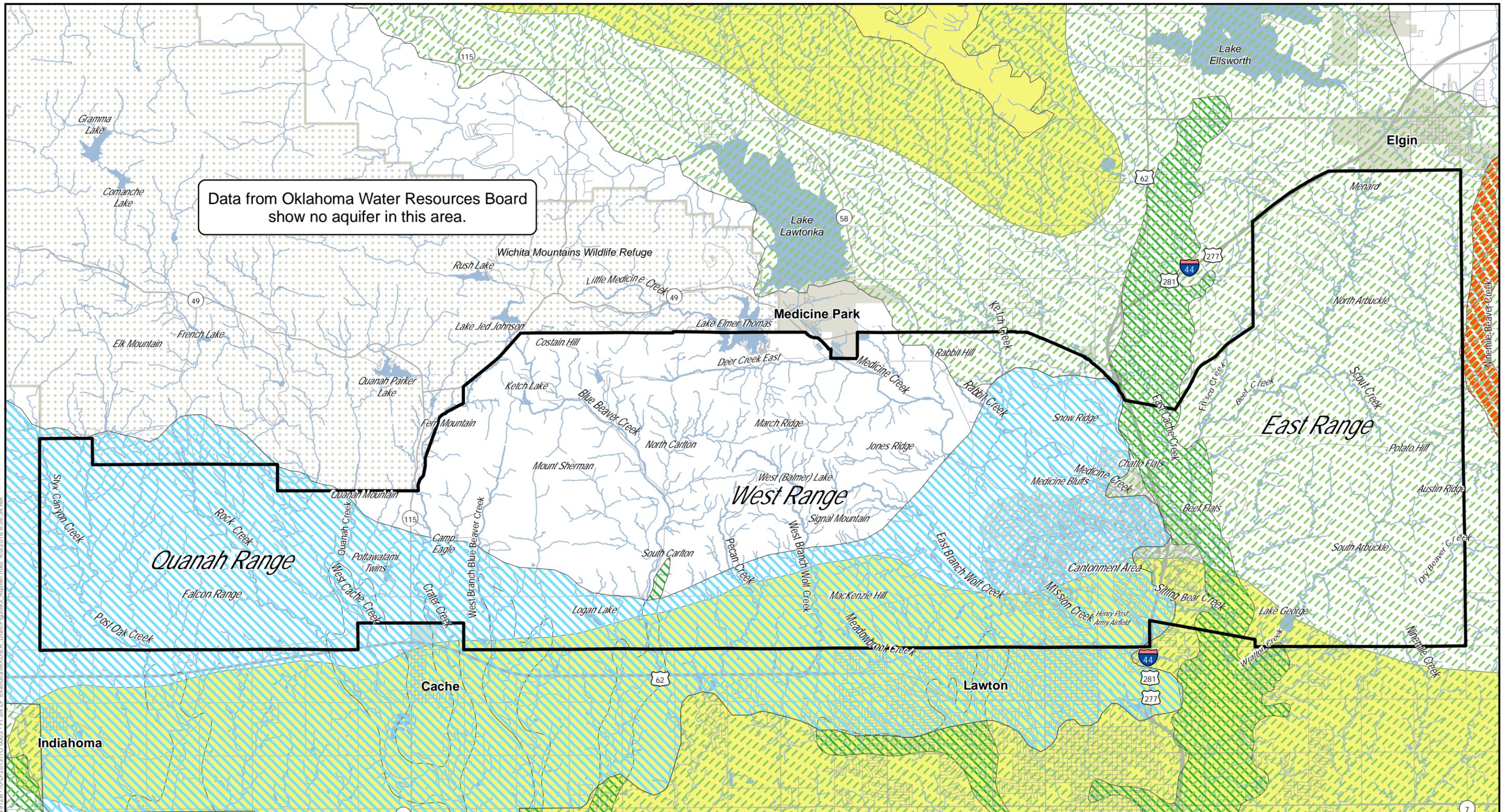
- General Region of Influence (ROI)
- Fort Sill
- City/Town
- Cantonment Area
- National Wildlife Refuge
- Road
- Water
- Stream
- Proposed Firebreak
- Woody Vegetation Removal Area (WVRA)
- 100-Year Floodplain

Sources:  
Fort Sill, 2014-2016:  
Cantonment, Firebreaks, Installation,  
Ranges, Roads, Water, Streams  
URS, 2016: ROI  
U.S. Census Bureau, 2010:  
City/Town  
USFWS, 2011: National Wildlife  
Refuge  
FEMA, 2009, 2015: Floodplain

**Firebreaks and  
WVRA Within  
Floodplain**

DRAFT  
ENVIRONMENTAL ASSESSMENT

Date: 4/4/2016 Figure 3.9-2



Data from Oklahoma Water Resources Board show no aquifer in this area.

File: L:\AEG\Projects\ENV\SAC\EOA\Systema\W912B-10-D-2013\TO 0003 - Ft. Sill LF Eval\GIS\MXD\DEA\_Draft\Fig0903\_Aquifer.mxd, 4/5/2016 8:59:34 AM

0 1.75 Miles

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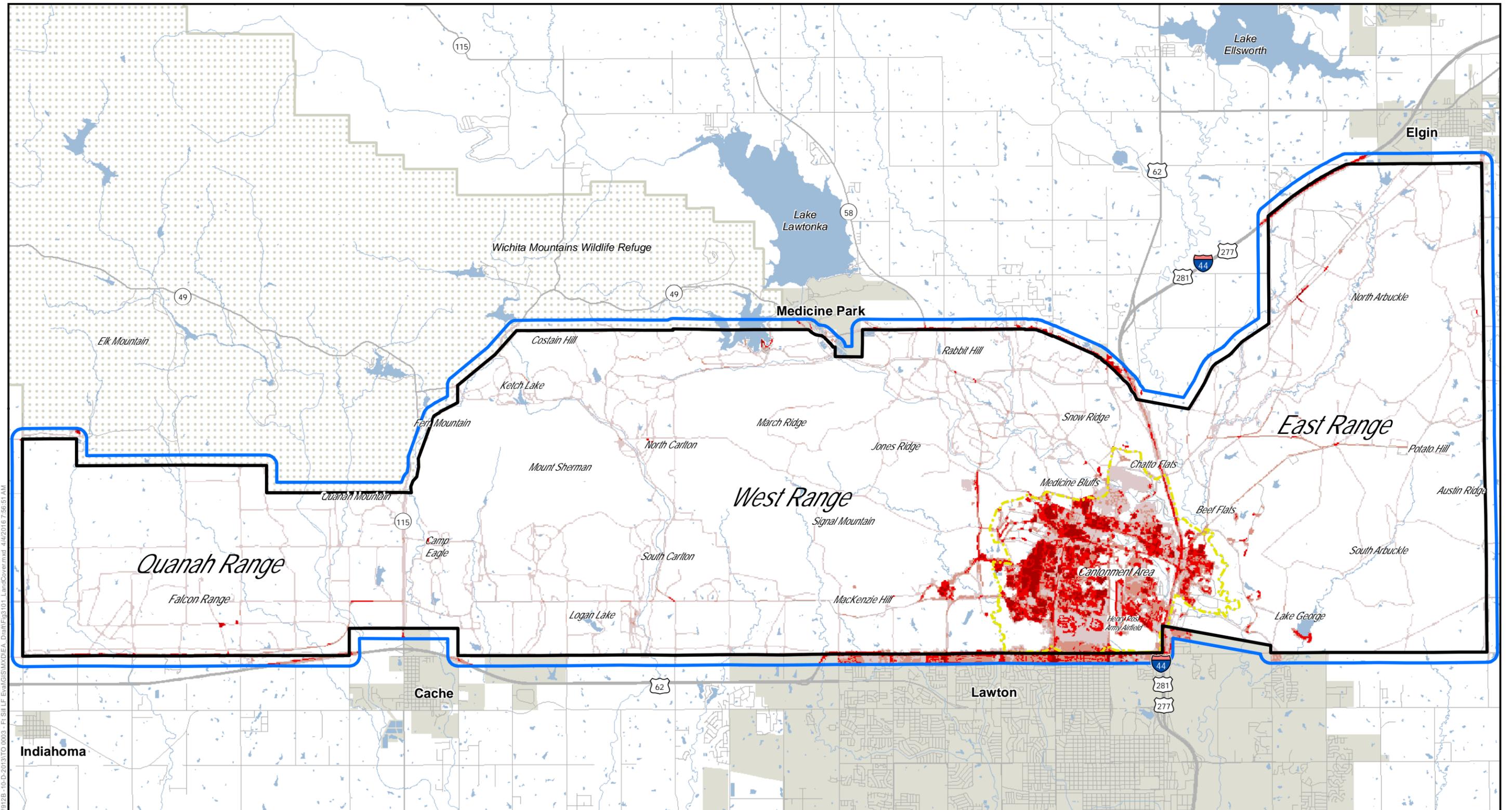
<b>Legend</b>	<b>Major Aquifers</b>	<b>Minor Aquifers</b>
<ul style="list-style-type: none"> <li> Fort Sill</li> <li> City/Town</li> <li> Cantonment Area</li> <li> National Wildlife Refuge</li> <li> Road</li> </ul>	<ul style="list-style-type: none"> <li> Water</li> <li> Stream</li> <li> Arbuckle-Timbered Hills</li> </ul>	<ul style="list-style-type: none"> <li> Beaver Creek Alluvium and Terrace</li> <li> Cache Creek Alluvium and Terrace</li> <li> Hennessey - Garber Bedrock</li> <li> Post Oak Bedrock</li> </ul>

Sources:  
Fort Sill, 2014-2016:  
Cantonment, Firebreaks, Installation,  
Ranges, Roads, Water  
U.S. Census Bureau, 2010: City/Town  
USFWS, 2011: National Wildlife Refuge  
Oklahoma Water Resources Board, 2011:  
Aquifers

**Aquifers**

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Date: 4/5/2016	Figure 3.9-3
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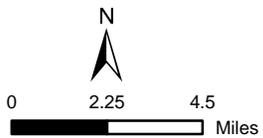
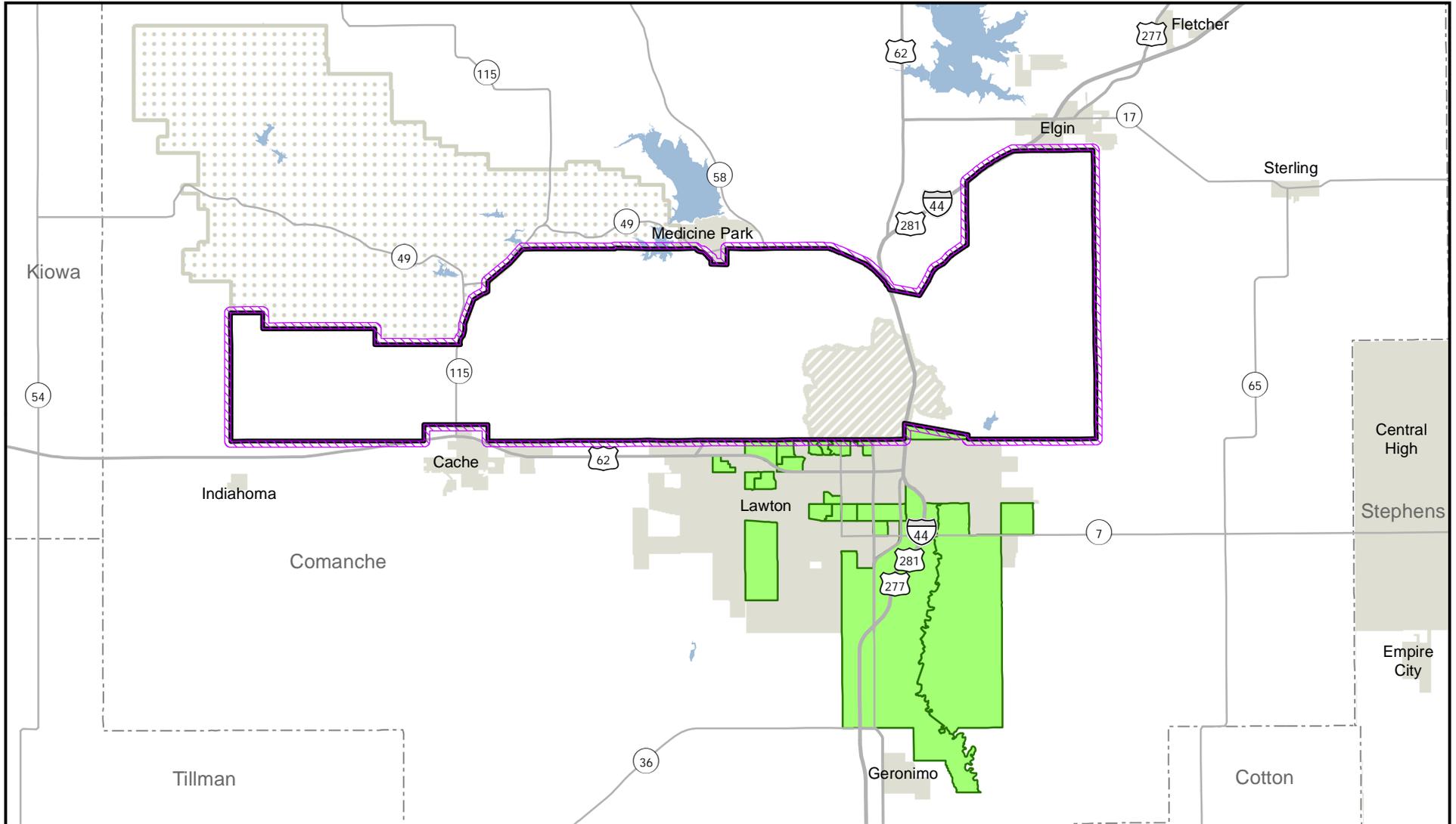
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Legend		Land Cover	
	General Region of Influence (ROI)		Developed, High Intensity
	Fort Sill		Developed, Low Intensity
	City/Town		Developed, Medium Intensity
	Cantonment Area		Developed, Open Space
	National Wildlife Refuge		
	Road		
	Water		

**Sources:**  
 Fort Sill, 2014-2016:  
 Cantonment, Firebreaks, Installation,  
 Ranges, Roads, Water, Agricultural Leases  
 URS, 2016: ROI  
 U.S. Census Bureau, 2010:  
 City/Town  
 USFWS, 2011: National Wildlife  
 Refuge  
 FEMA, 2015: Floodplain  
 USGS, 2011: Land Cover

**Installation  
 Land Cover  
 (Development)**  
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Date: 4/4/2016	Figure 3.10-1
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**Legend**

- Minority Population 49% to 66%
- Socioeconomic Region of Influence (ROI)
- Fort Sill
- County Boundary
- City/Town
- Cantonment Area
- National Wildlife Refuge
- Water
- Road

Sources:  
 EPA EJSCREEN, 2014: Minority Population  
 Fort Sill, 2014-2016: Installation, Cantonment  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge  
 USGS, 2010: County Boundary  
 URS, 2016: ROI

**Environmental Justice  
 Minority Population**

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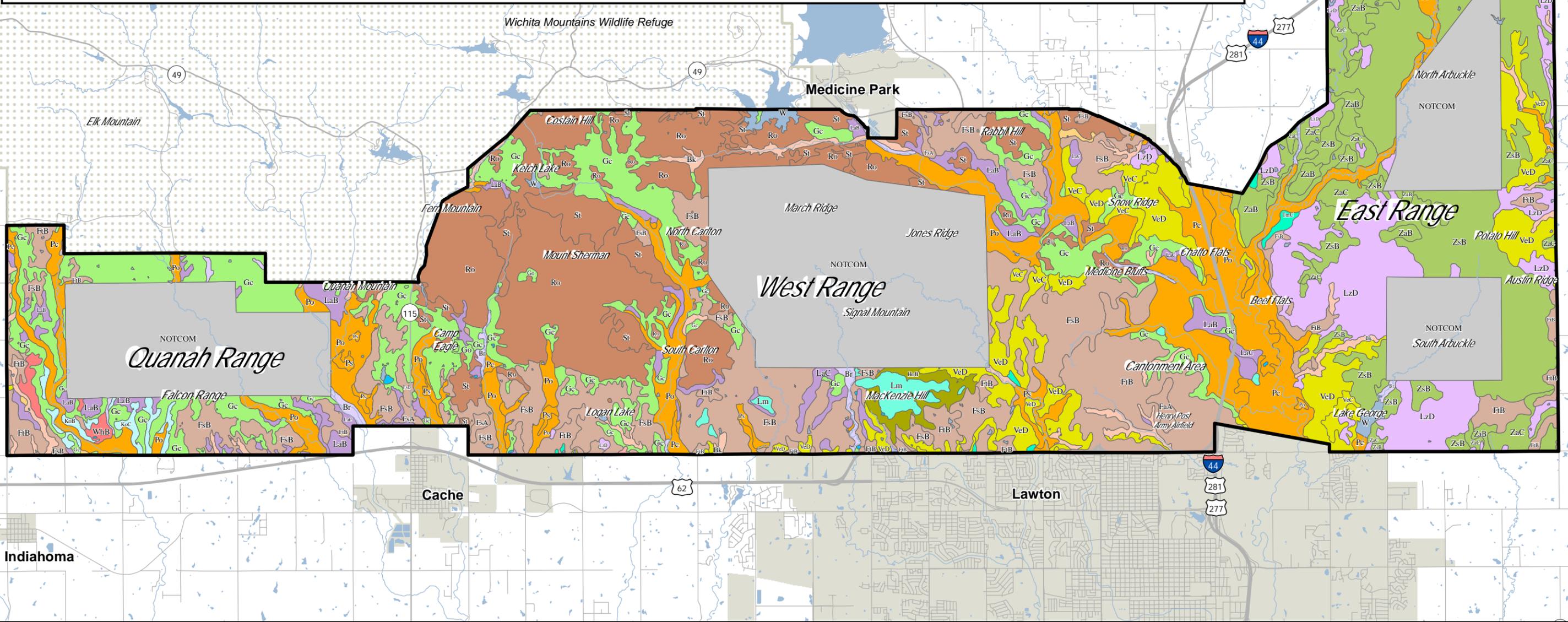
Date: 4/5/2016

Figure 3.12-1



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- |  |   |  |
|--|---|--|
| Bk - Vernon-Clairemont complex, 0 to 12 percent slopes                     | KoC - Konawa loamy fine sand, 3 to 5 percent slopes                     | SmA - Stamford clay, 1 to 3 percent slopes         |
| Br - Ashport soils, 0 to 1 percent slopes, frequently flooded              | LaB - Lawton loam, 1 to 3 percent slopes                                | TmC - Tillman clay loam, 3 to 5 percent slopes     |
| Es - Tillman and Vernon soils, 2 to 8 percent slopes, severely eroded      | LaC - Lawton loam, 3 to 5 percent slopes                                | VeC - Vernon clay, 3 to 5 percent slopes           |
| Et - Zaneis and Stephenville soils, 2 to 8 percent slopes, severely eroded | Lm - Somervell very cobbly loam, 8 to 45 percent slopes                 | VeD - Vernon-Knoco complex, 5 to 12 percent slopes |
| FaA - Foard silt loam, 0 to 1 percent slopes                               | LzD - Lucien-Grainola-Zaneis complex, 5 to 12 percent slopes            | W - Water  |
| FsA - Foard-Hinkle complex, 0 to 1 percent slopes                          | NOTCOM - Area not surveyed, access denied                               | WhB - Windthorst sandy loam, 1 to 3 percent slopes |
| FsB - Foard-Hinkle complex, 1 to 3 percent slopes                          | PIT - Pits  | WhC - Windthorst sandy loam, 3 to 5 percent slopes |
| FtB - Foard and Tillman soils, 1 to 3 percent slopes                       | Pc - Ashport clay loam, 0 to 1 percent slopes, occasionally flooded     | ZaB - Zaneis loam, 1 to 3 percent slopes           |
| Gc - Brico-Rock outcrop complex, 5 to 40 percent slopes                    | Po - Ashport loam, 0 to 1 percent slopes, occasionally flooded          | ZaC - Zaneis loam, 3 to 5 percent slopes           |
| Go - Granite outcrop   | Ps - Ashport-Oscar complex, 0 to 1 percent slopes, occasionally flooded | ZsB - Zaneis-Huska complex, 1 to 3 percent slopes  |
| HoB - Hollister silt loam, 0 to 1 percent slopes                           | Ro - Rock outcrop-Brico complex, 3 to 20 percent slopes                 | ZaC2 - Zaneis loam, 3 to 5 percent slopes, eroded  |
| KoB - Konawa loamy fine sand, 1 to 3 percent slopes                        | St - Brico soils and Rock outcrop, 15 to 50 percent slopes              |  |



0 1.75 Miles

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**Legend**

- Fort Sill
- City/Town
- National Wildlife Refuge
- Road
- Water

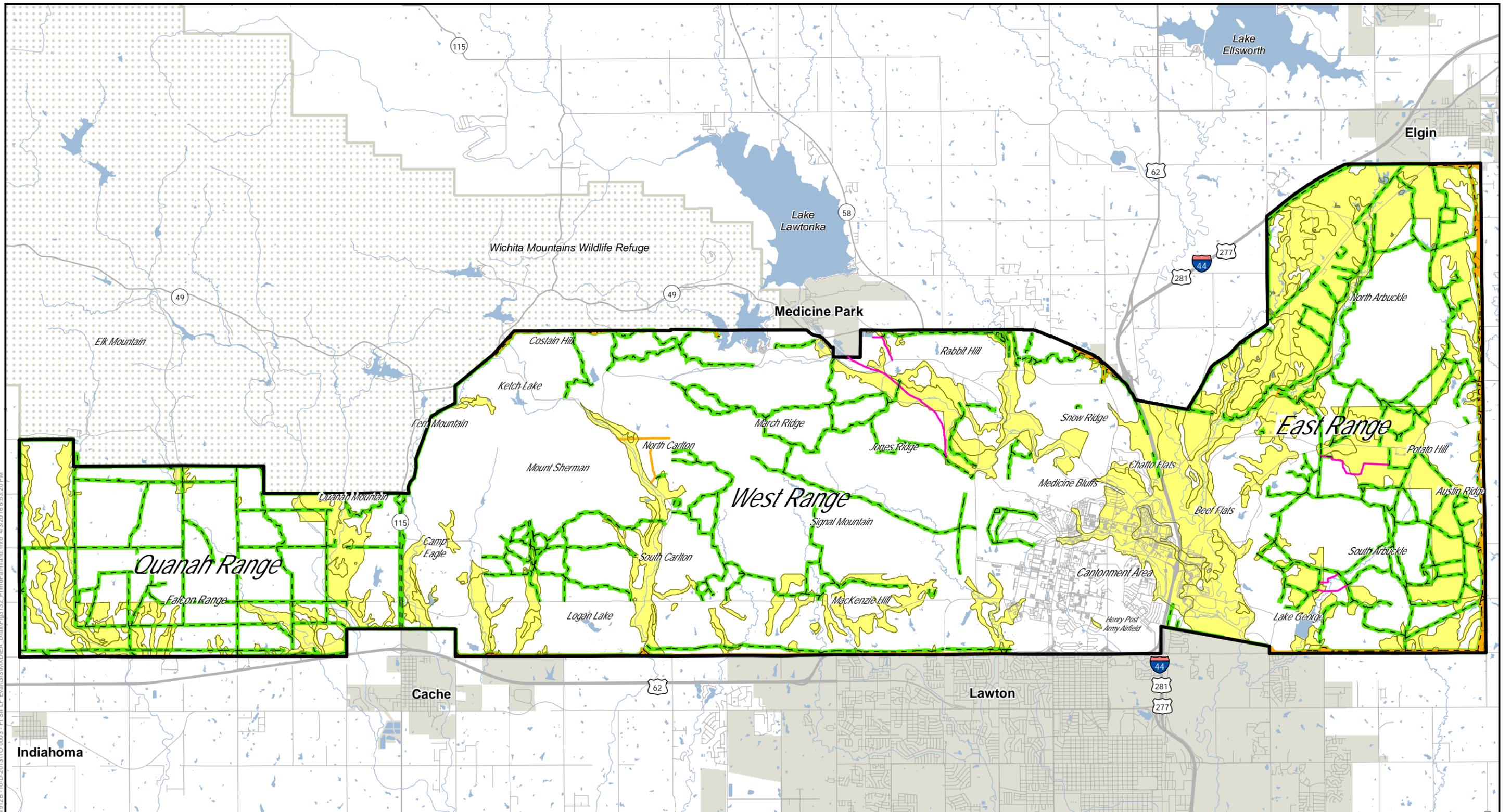
**Sources:**  
 Fort Sill, 2014-2016:  
 Cantonment, Firebreaks, Installation,  
 Ranges, Roads, Water, Streams, Soils  
 U.S. Census Bureau, 2010:  
 City/Town  
 USFWS, 2011: National Wildlife  
 Refuge  
 FEMA, 2009, 2015: Floodplain

**Mapped Soil Types  
at Fort Sill**

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Date: 4/4/2016	Figure 3.13-1
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File: L:\AGE\Projects\ENVUSACE\DOA\Systema\W912B-10-D-2013\TO 0003 - Ft. Sill LF Eval\GIS\MXD\IEA\_Draft\Fig3.132\_PrimeFarmland.mxd, 4/3/2016 8:53:20 PM

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**Legend**

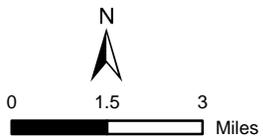
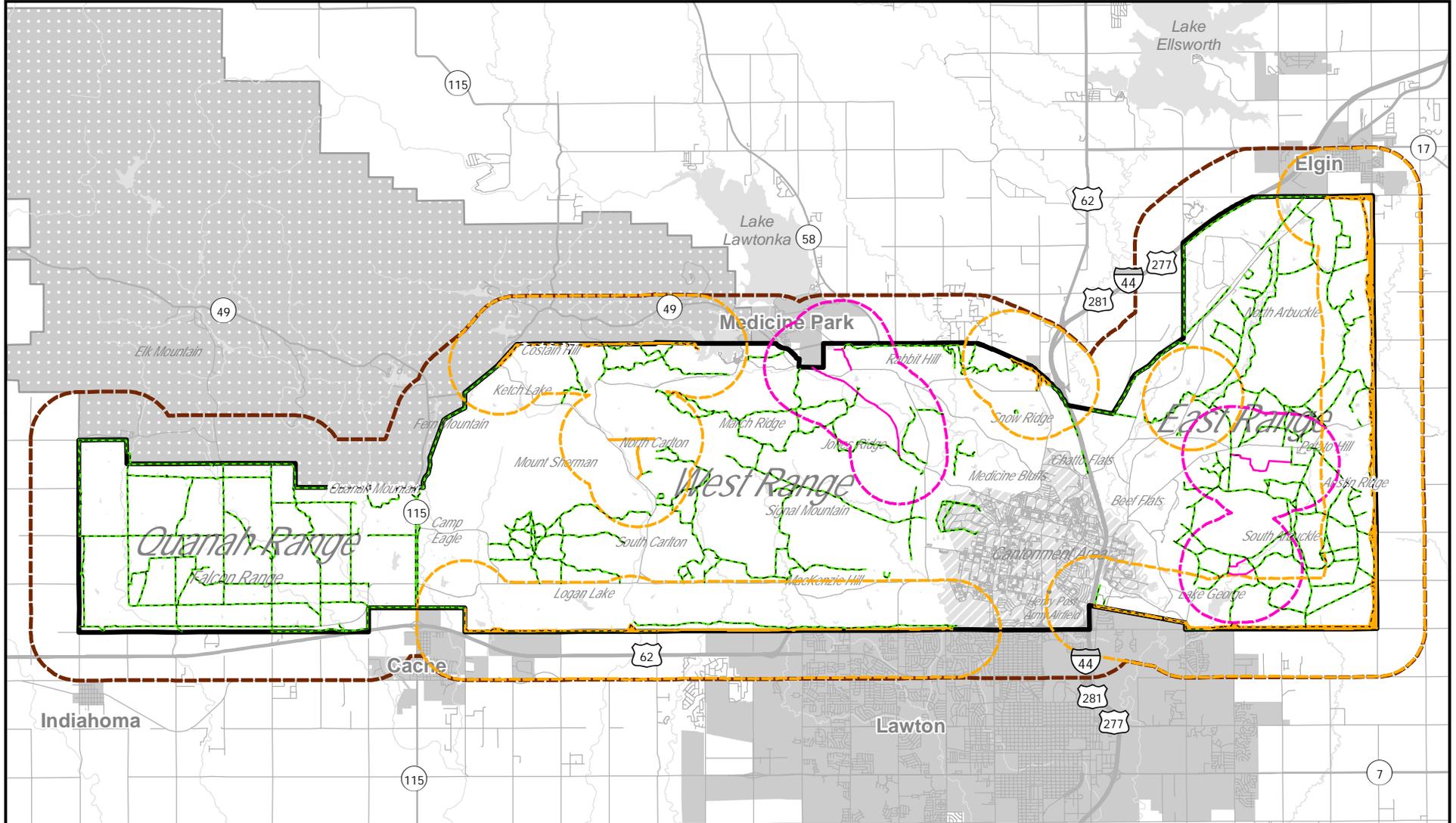
- Fort Sill
- City/Town
- National Wildlife Refuge
- Road
- Water
- Proposed Firebreak
- Existing Firebreak
- Prime Farmland Soils
- Woody Vegetation Removal Area

**Sources:**  
Fort Sill, 2014-2016:  
Cantonment, Firebreaks, Installation,  
Ranges, Roads, Water, Streams, Soils,  
Firebreaks  
U.S. Census Bureau, 2010:  
City/Town  
USFWS, 2011: National Wildlife  
Refuge

**Prime Farmland  
Soils**

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Date: 4/3/2016	Figure 3.13-2
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**Legend**

- Fort Sill
- Existing Firebreak
- Proposed Firebreak
- Woody Vegetation Removal Area
- City/Town
- National Wildlife Refuge
- Aerial Spraying Region of Influence (ROI)
- Firebreak ROI
- WVRA ROI
- Cantonment Area
- Road
- Water

**Sources:**

- Fort Sill, 2014-2016: Cantonment, Firebreaks, Installation, Ranges, Roads, Water, Streams, Soils, Firebreaks, Woody Veg. Removal Areas
- U.S. Census Bureau, 2010: City/Town
- USFWS, 2011: National Wildlife Refuge
- URS, 2016: Buffers

**Prime Farmland ROI**

**DRAFT ENVIRONMENTAL ASSESSMENT**

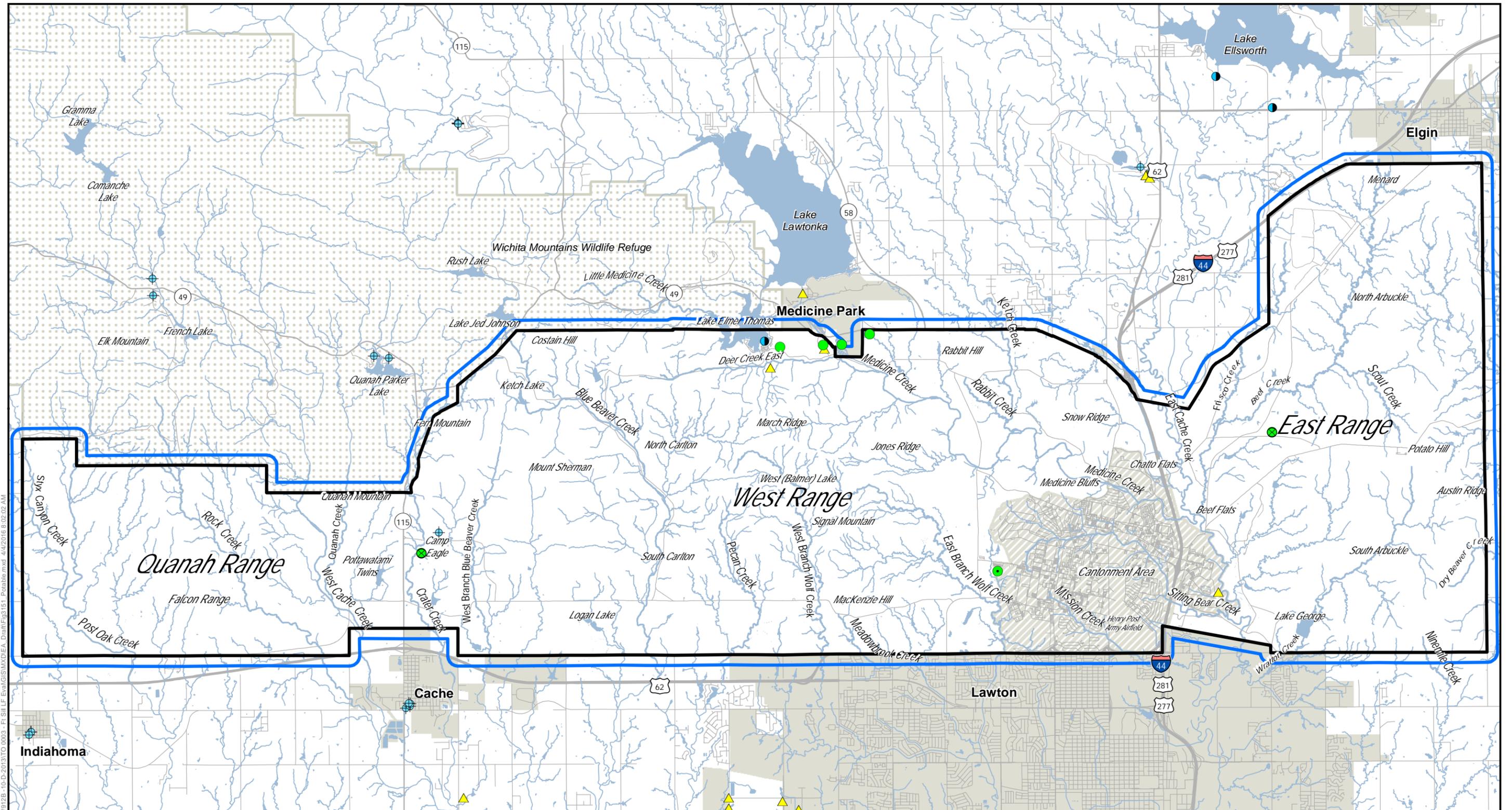
Date: 4/4/2016

Figure 3.13-3



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File: L:\AEG\Projects\ENV\SAC\EOA\Systema\W912B-10-D-2013\TO 0003 - Ft. Sill LF Eval\GIS\MXD\DEA\_Draft\Fig3.15-1\_Potable.mxd 4/4/2016 8:02:02 AM

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**Legend**

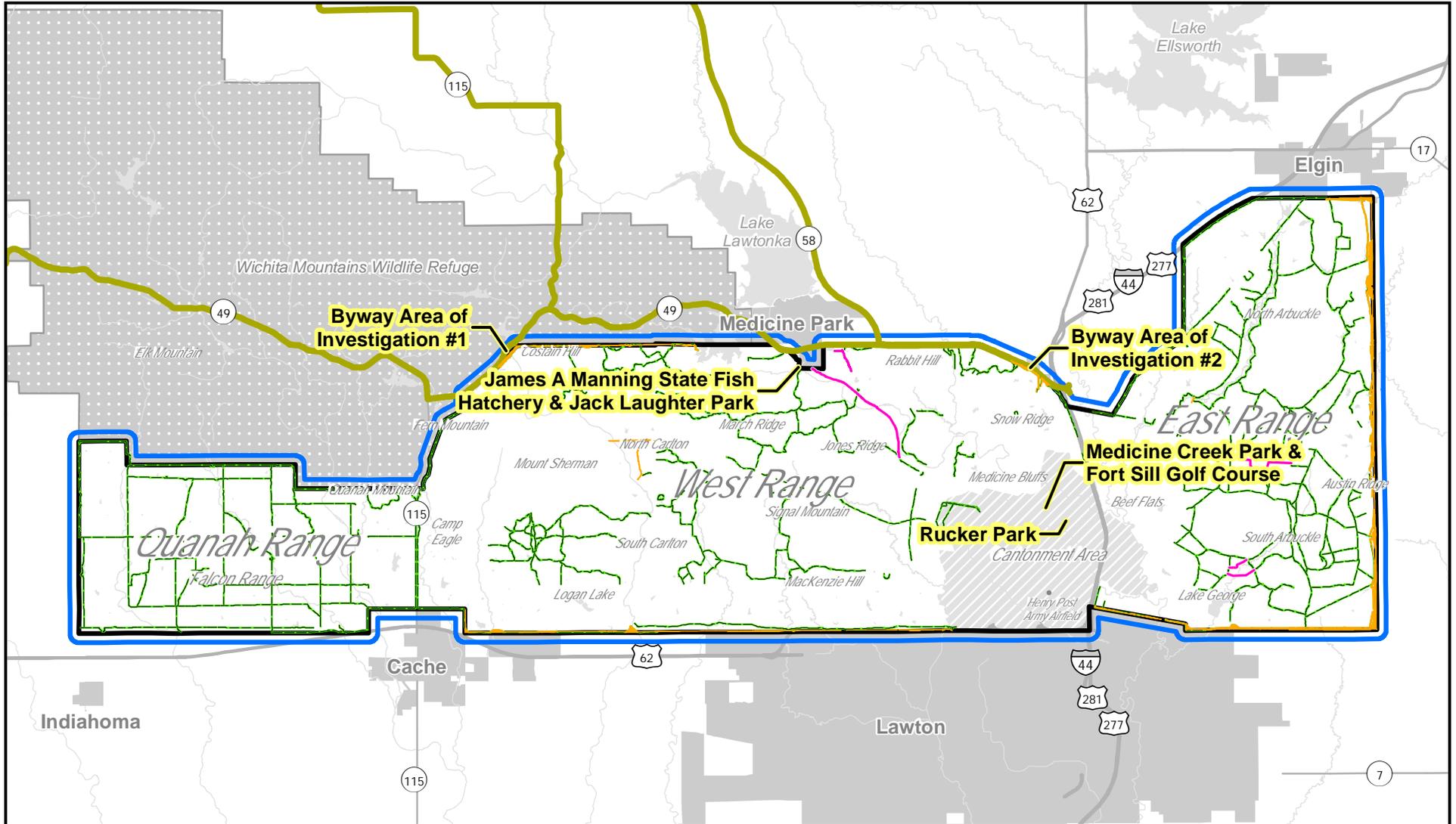
General Region of Influence (ROI)	Water	Active Lagoon
Fort Sill	Stream	Non-Active Lagoon (dry or in process of closing)
City/Town	PDES Discharge	Central Wash Facility (not a lagoon, although there is an industrial waste water permit)
Cantonment Area	PWS Surface Water Intake	
National Wildlife Refuge	PWS Well	
Road		

**Sources:**  
Fort Sill, 2014-2016: Cantonment, Firebreaks, Installation, Lagoons, Ranges, Roads, Water  
URS, 2016: ROI  
U.S. Census Bureau, 2010: City/Town  
USFWS, 2011: National Wildlife Refuge  
ODEQ, 2014: Land Application Site, PDES Discharge, PWS Surface Water Intake, PWS Well, Total Retention Facility

**Potable Water and Wastewater Resources**

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Date: 4/4/2016	Figure 3.15-1
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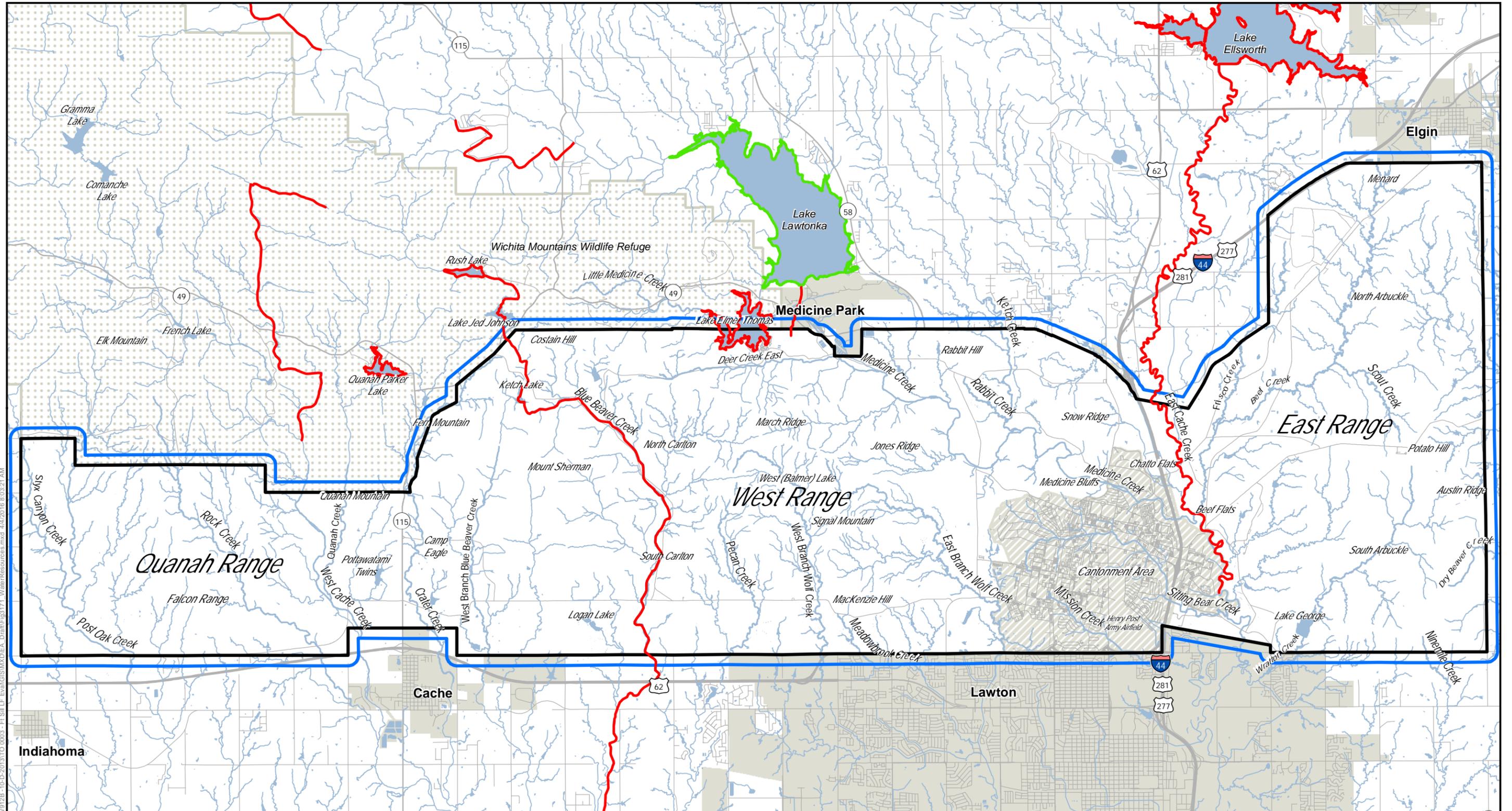
**Legend**

- Wichita Mountains Scenic Byway
- Woody Vegetation Removal Area
- Proposed Firebreak
- Existing Firebreak
- General Region of Influence (ROI)
- Ft. Sill
- City/Town
- National Wildlife Refuge
- Cantonment Area
- Water

**Sources:**  
 Fort Sill, 2014-2016: Cantonment, Installation, Fire Breaks, Ranges, Roads, Water, Woody Vegetation Removal Area  
 FHWA, 2015: Wichita Mountains Scenic Byway  
 URS, 2016: ROI  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

**Aesthetics and Visual Resources**  
  
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Date: 3/28/2016	Figure 3.16-1
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 0 1.75 Miles  
  

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**Legend**

 General Region of Influence (ROI)	 Water	<b>Impaired Waterbodies (303d)</b>
 Fort Sill	 Stream	 Category 4a
 City/Town		 Category 5
 Cantonment Area		
 National Wildlife Refuge		
 Road		

**Sources:**  
 Fort Sill, 2014-2016:  
 Cantonment, Firebreaks, Installation,  
 Ranges, Roads, Water  
 URS, 2016: ROI  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge  
 ODEQ, 2014: Impaired Waterbodies

**Water Resources**  
 DRAFT  
 ENVIRONMENTAL ASSESSMENT

Date: 4/4/2016	Figure 3.17-1
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## CHAPTER 9 TABLES

Table 3.4-1. Vegetation Types within the ROI Based on NLCD

Land Cover	% of Fort Sill
Open Water	0.75
Developed, Open Space	7.35
Developed, Low Intensity	2.34
Developed, Medium Intensity	2.12
Developed, High Intensity	0.68
Barren Land	0.07
Deciduous Forest	9.74
Evergreen Forest	0.08
Mixed Forest	0.03
Shrub/Scrub	2.11
Herbaceous	73.18
Cultivated Crops	1.53
Emergent Herbaceous Wetlands	0.02
Total	100

Source: Homer, et al. 2015 (GIS)

Table 3.12-1. Comparison of Disadvantaged Populations within ROI to Larger Geographies

	ROI	Oklahoma Average	Percentile in Oklahoma	EPA Region 6 Average	Percentile in EPA Region	U.S. Average	Percentile in US
Minority Population	51%	31%	85	49%	55	36%	69
Low-Income Population	41%	38%	57	39%	56	34%	66
Linguistically Isolated Population	3%	2%	83%	6%	57%	5%	65%
Population With Less Than High School Education	11%	14%	46	18%	38	14%	50

Source: EPA 2016

**Table 6-1. Management Team**

<b>Name</b>	<b>Role / Company</b>
Scottie Fiehler	Project Manager, Tulsa-USACE
Frank Roepke	Technical Manager, Tulsa-USACE
Sarah Sminkey	NEPA Coordinator, Fort Sill
Steve Gunzelman	Program Manager, OAS
Susan Schnelle	Quality Assurance Manager, OAS
Debra Richmann	Subcontract/Program Manager, Project Principal, URS Group
Darrell Jones, PE (TX)	Task Order Manager, URS Group
Lara Zuzak, AICP, PMP	Fire Mitigation EA Project Manager, URS Group

**Table 6-2. List of Preparers**

<b>Name</b>	<b>Role / Company</b>
R. Christopher Goodwin, Ph.D.	Principle Investigator, RCG&A
Janice McLean	Project Manager, RCG&A
Alan Potter, Shannon Ryan, Paul Demers	RCG&A
Kelly Krenz, PG (TX)	Independent Technical Reviewer, URS Group
Keith Dewey, AICP	Independent Technical Reviewer, URS Group
Vanessa Benavides, PE (TX)	Task Leader, URS Group
Jennifer Oakley	Task Leader, URS Group
Josh Orr	Task Leader, URS Group
Allyson Rezac	Deputy Project Manager for Fire Mitigation EA, URS Group
JT Stewart, AICP	Task Leader, URS Group
John Wade, GISP	GIS Specialist, URS Group
Pam Bradley	Administrative Assistant, URS Group
Regina Geren	Administrative Assistant, URS Group

## Appendices

Appendix A – Detailed Maps of Woody Vegetation Removal Areas

Appendix B – Agency Correspondence

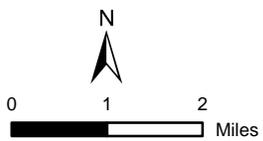
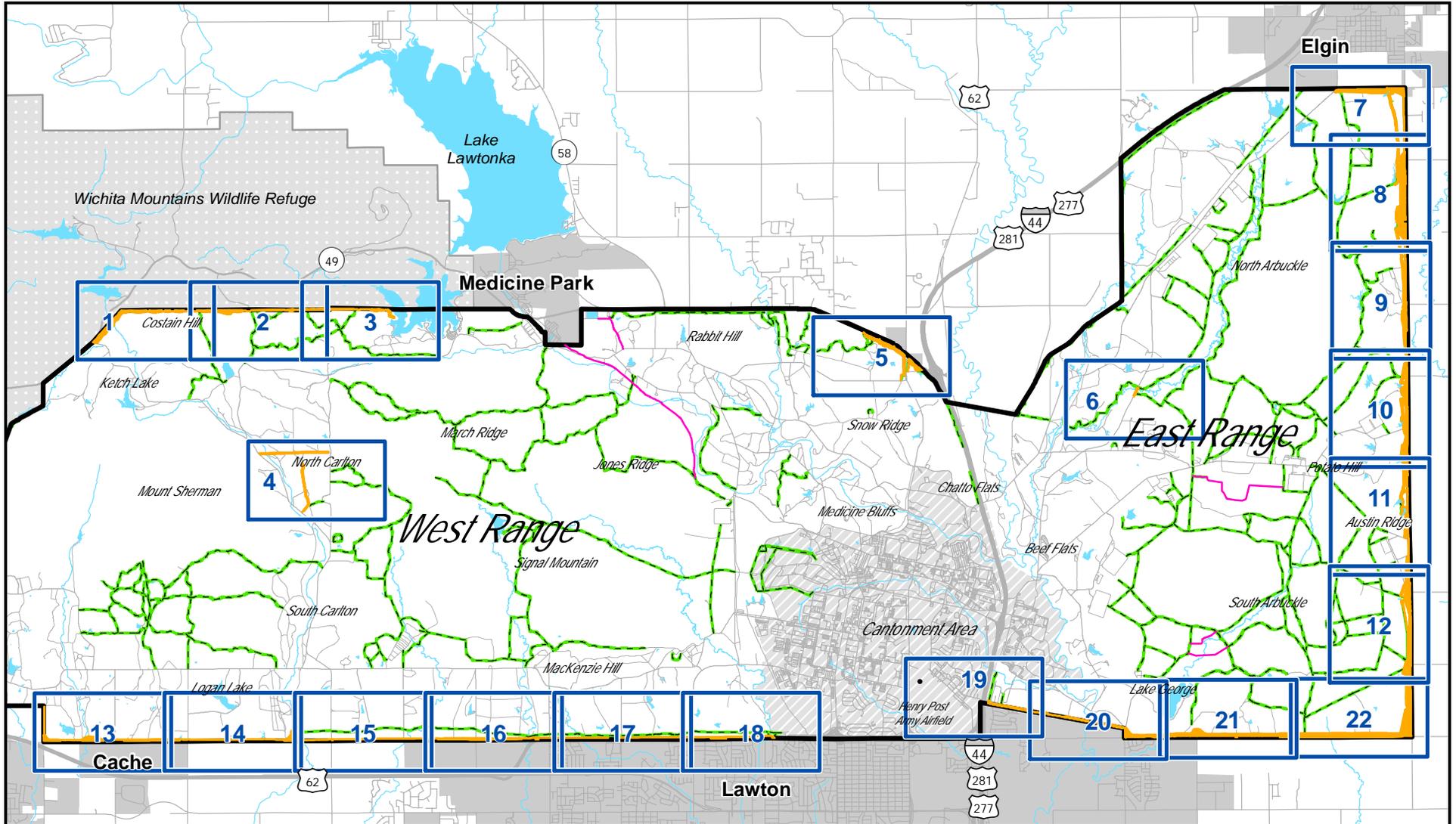
Appendix C – Cultural Resources Consultation

Appendix D – Demographic Summary Report

Appendix E – Prime Farmland Consultation Letter

Appendix F – INRMP Supplement 1.5.1a. Selected Fauna Known to Occur on Fort Sill

**Appendix A**  
**Detailed Maps of Woody Vegetation Removal Areas**



- Legend**
- Map Index
  - Proposed Firebreak
  - Existing Firebreak
  - Woody Vegetation Removal Area
  - Fort Sill
  - City/Town
  - National Wildlife Refuge
  - Cantonment Area
  - Road
  - Water

Sources:  
 Fort Sill, 2014-2016: Cantonment, Installation, Ranges, Roads, Water, Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

## Woody Vegetation Removal Areas Index Map

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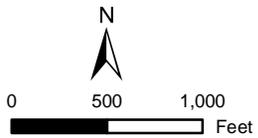
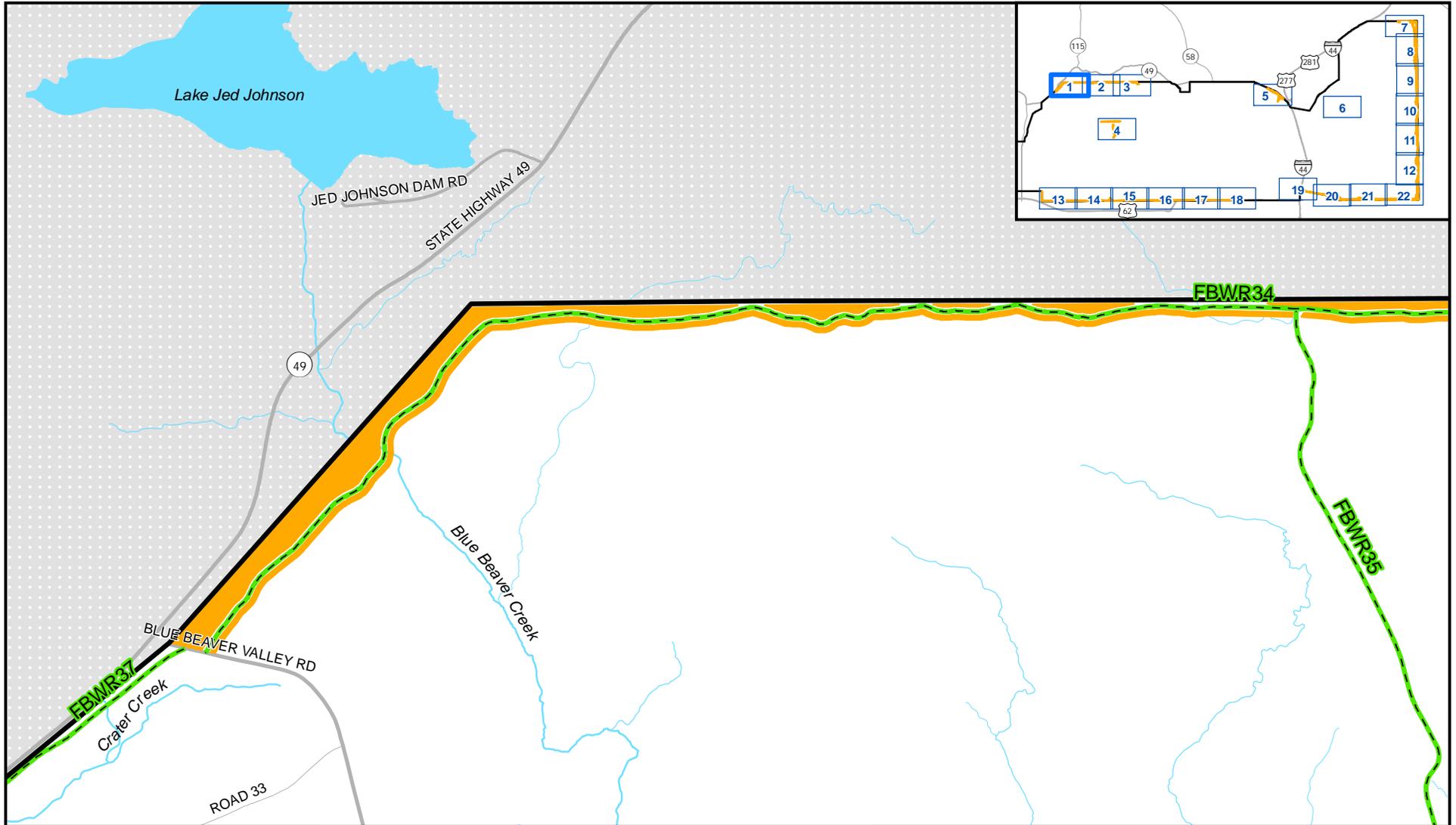
Date: 4/3/2016

Figure A-Index



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**Legend**

- Woody Vegetation Removal Area
- Existing Firebreak
- Fort Sill
- National Wildlife Refuge
- Water
- Road

Sources:  
 Fort Sill, 2014-2016: Cantonment, Installation, Roads, Water Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

**Woody Vegetation Removal Areas  
 Map 1**

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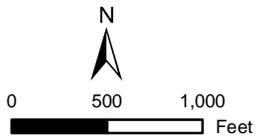
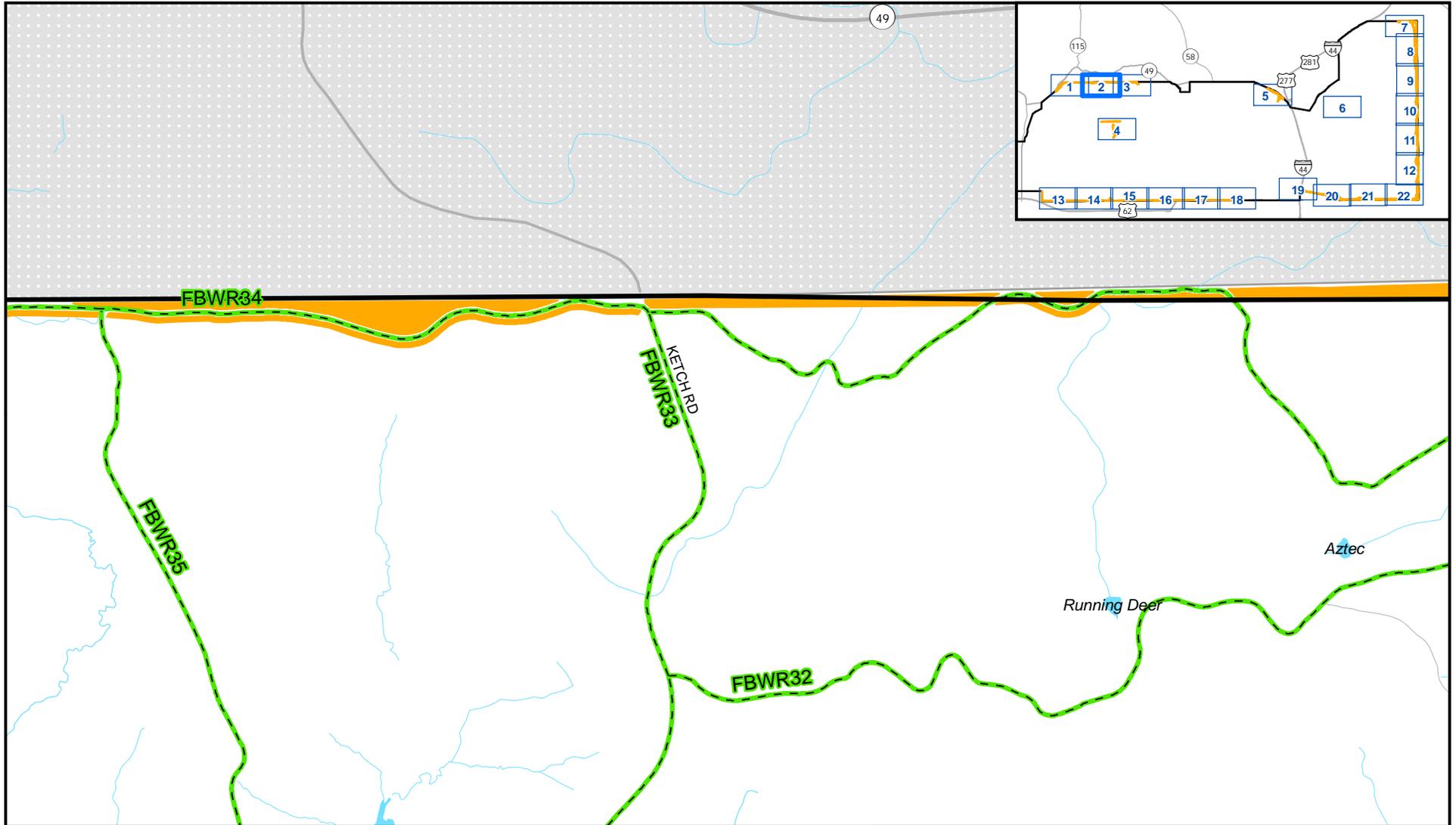
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Figure A-1



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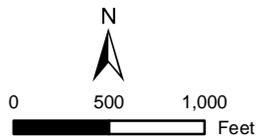
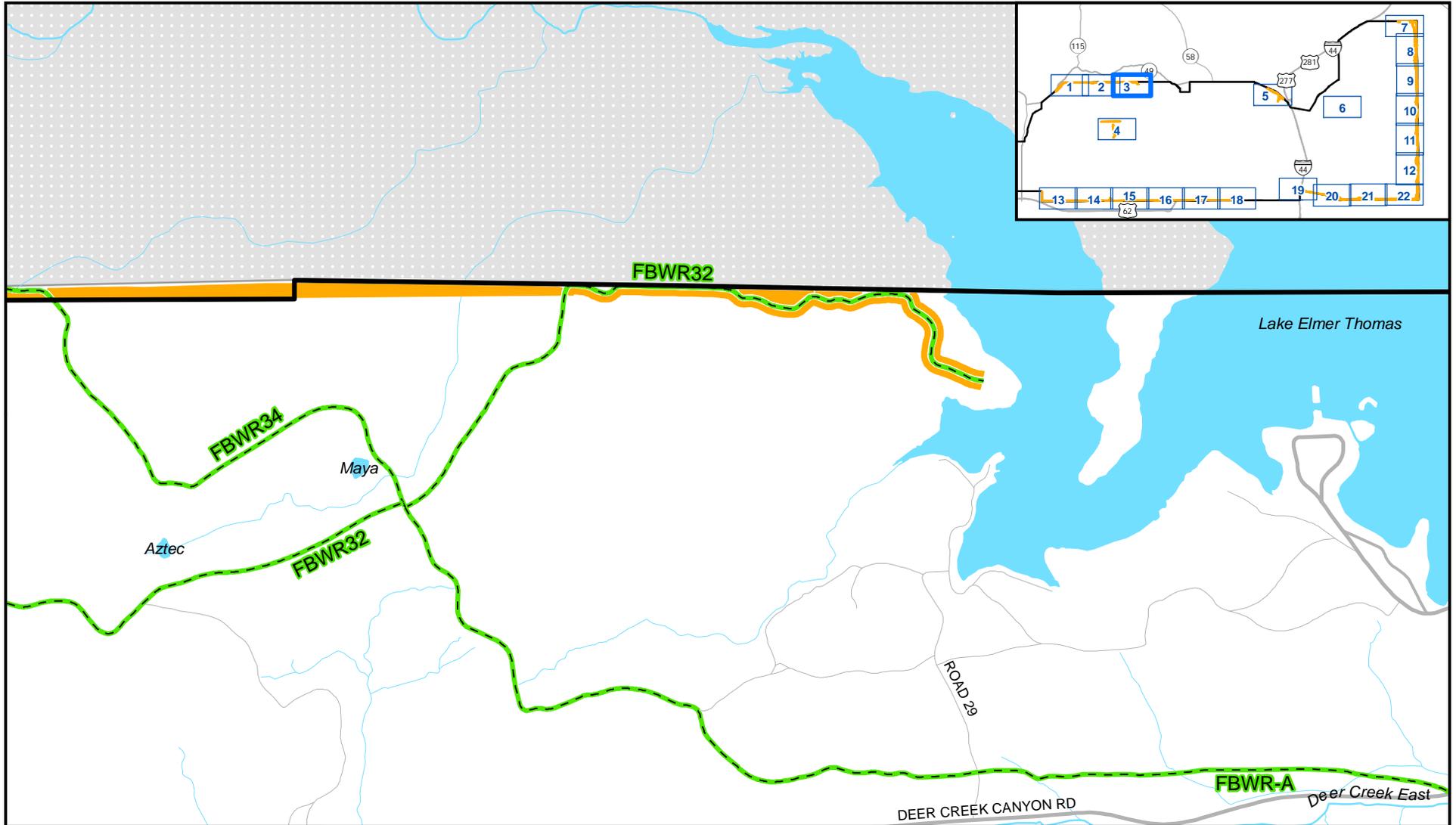


- Legend**
- Woody Vegetation Removal Area
  - Existing Firebreak
  - Fort Sill
  - National Wildlife Refuge
  - Water
  - Road

Sources:  
 Fort Sill, 2014-2016: Cantonment, Installation, Roads, Water  
 Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

**Woody Vegetation Removal Areas**  
**Map 2**  
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Date: 4/3/2016 Figure A-2



**Legend**

- Woody Vegetation Removal Area
- Existing Firebreak
- Fort Sill
- National Wildlife Refuge
- Water
- Road

Sources:  
 Fort Sill, 2014-2016: Cantonment, Installation, Roads, Water Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

**Woody Vegetation Removal Areas  
 Map 3**

DRAFT ENVIRONMENTAL ASSESSMENT

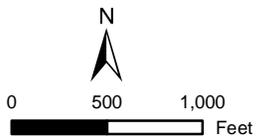
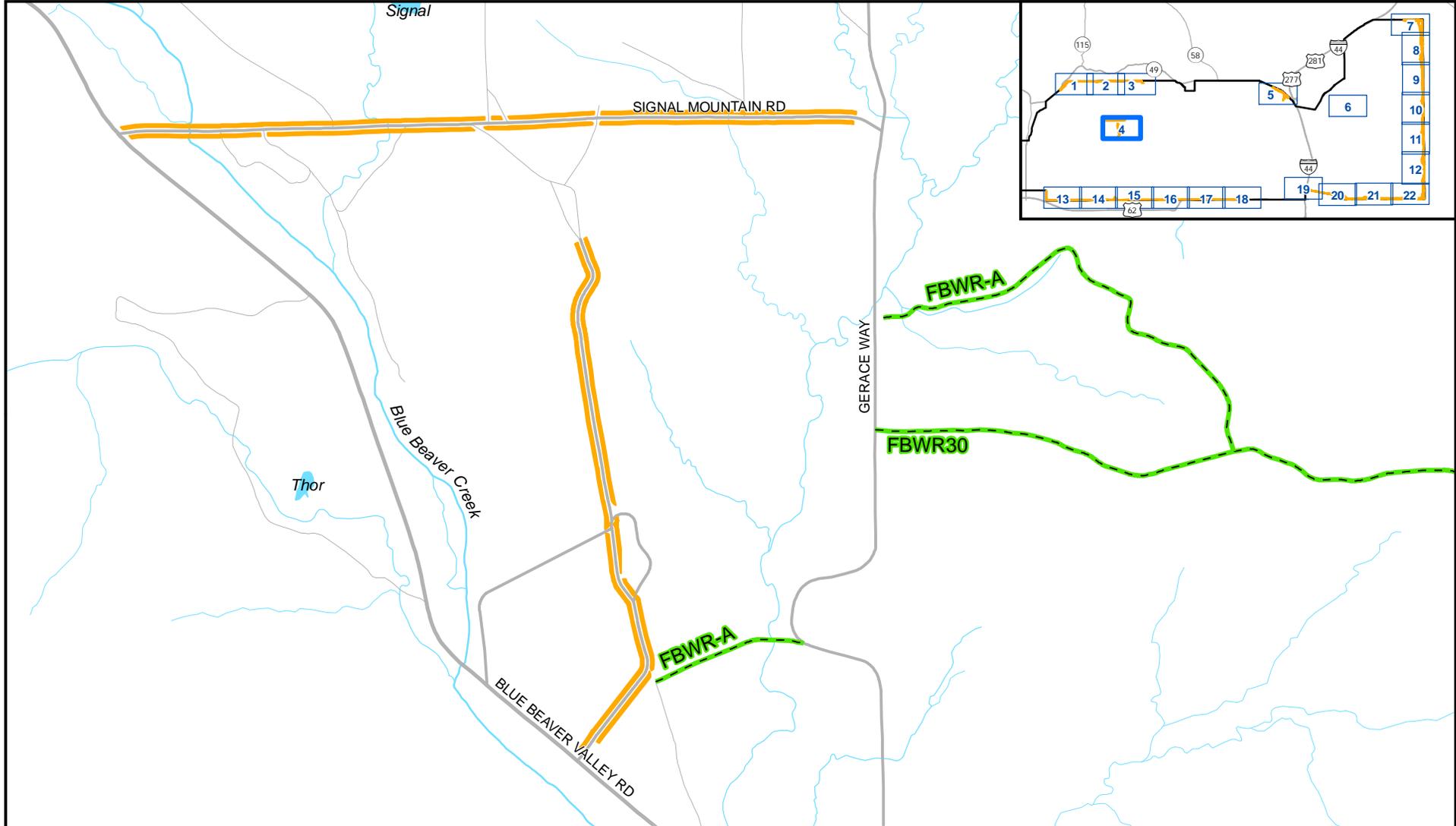
Date: 4/3/2016

Figure A-3



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- Legend**
- Woody Vegetation Removal Area
  - Existing Firebreak
  - Fort Sill
  - Water
  - Road

Sources:  
 Fort Sill, 2014-2016: Cantonment, Installation, Roads, Water  
 Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

**Woody Vegetation  
Removal Areas  
Map 4**

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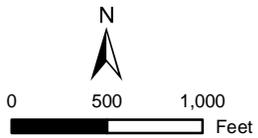
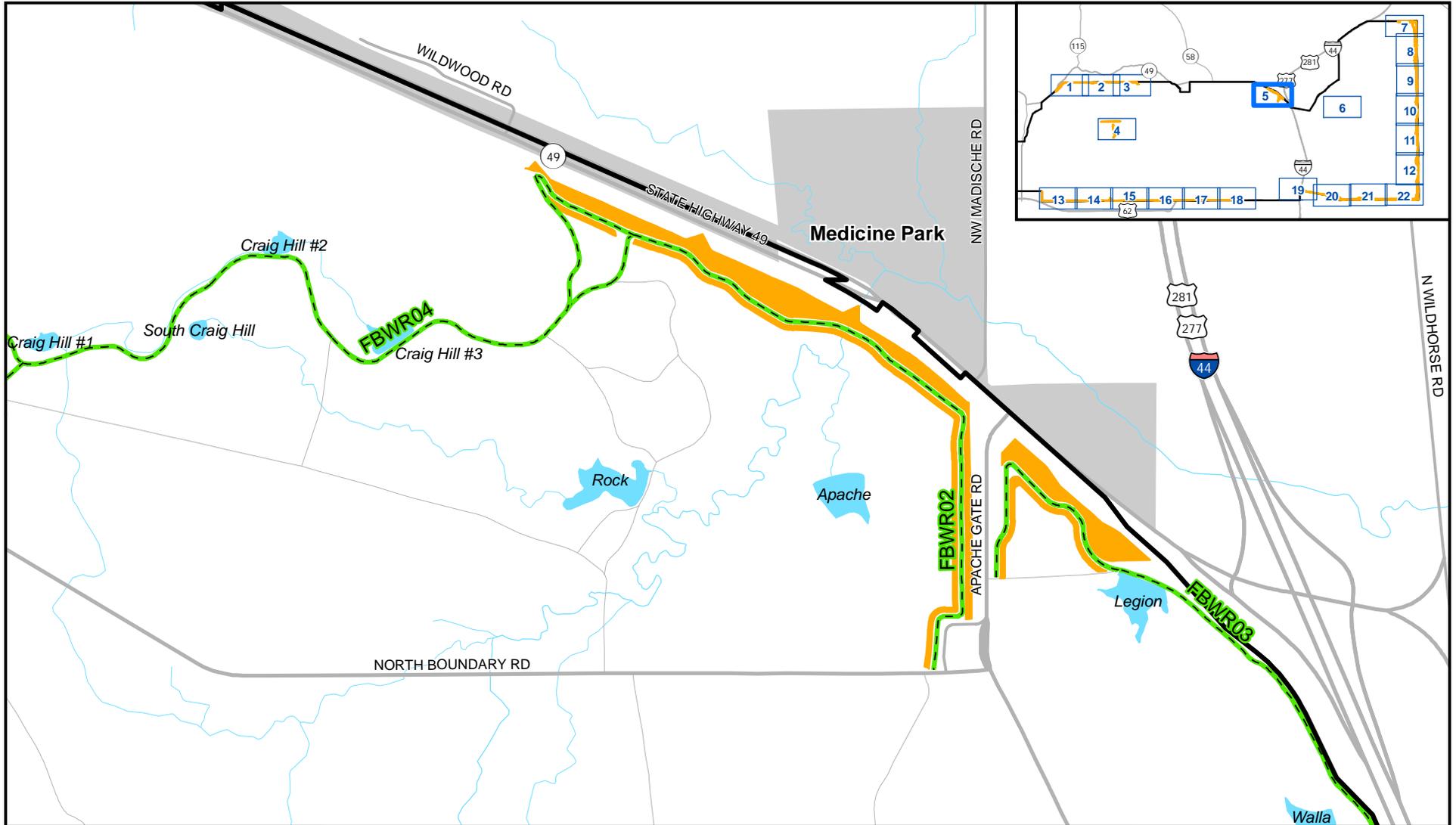
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Figure A-4



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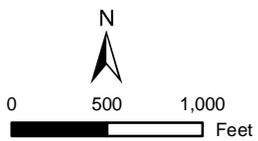
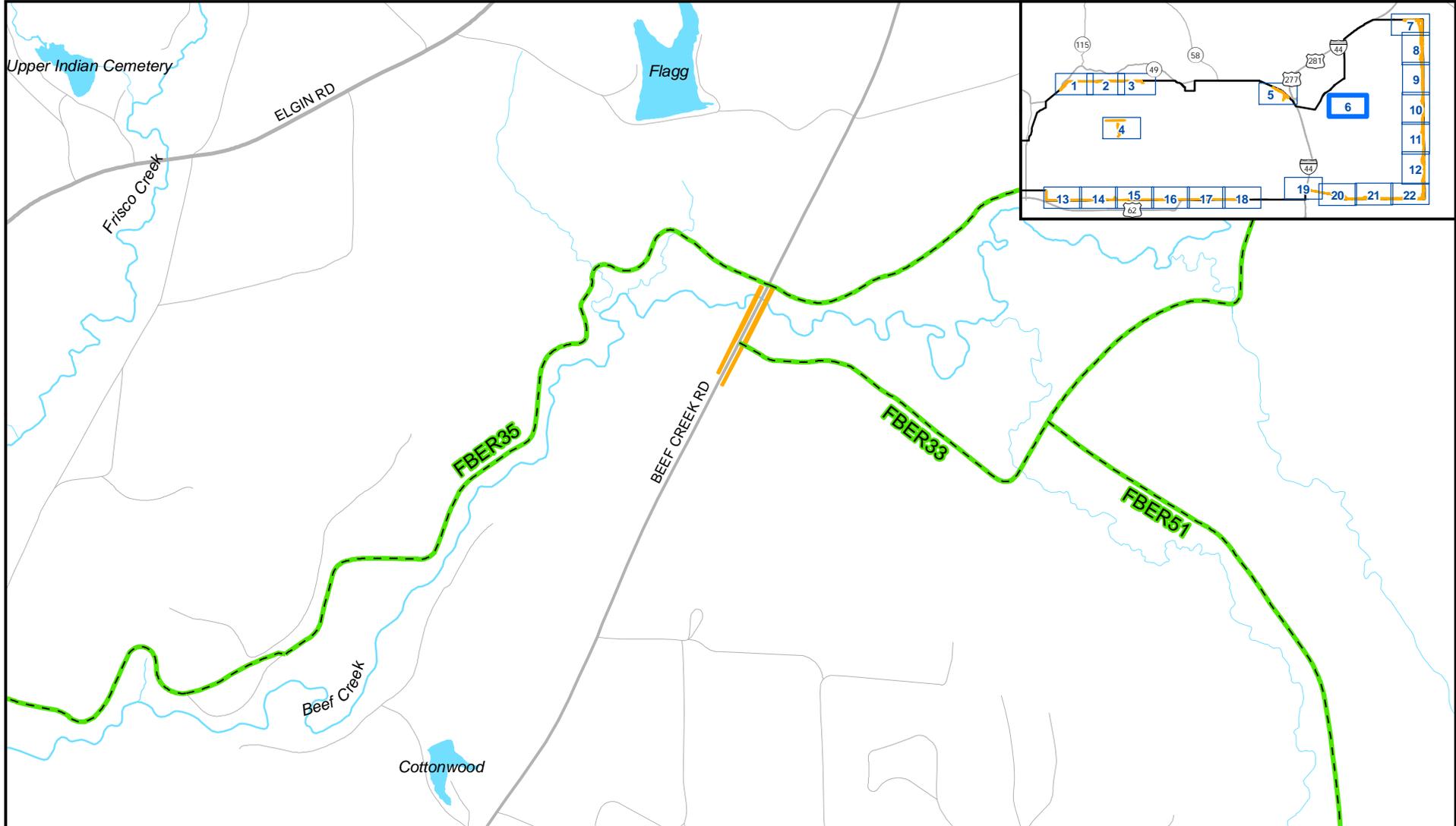


- Legend**
- Woody Vegetation Removal Area
  - Existing Firebreak
  - Fort Sill
  - City/Town
  - Water
  - Road

Sources:  
 Fort Sill, 2014-2016: Cantonment, Installation, Roads, Water  
 Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

**Woody Vegetation  
 Removal Areas  
 Map 5**

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- Legend**
- Woody Vegetation Removal Area
  - Existing Firebreak
  - Fort Sill
  - Water
  - Road

Sources:  
 Fort Sill, 2014-2016: Cantonment, Installation, Roads, Water  
 Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

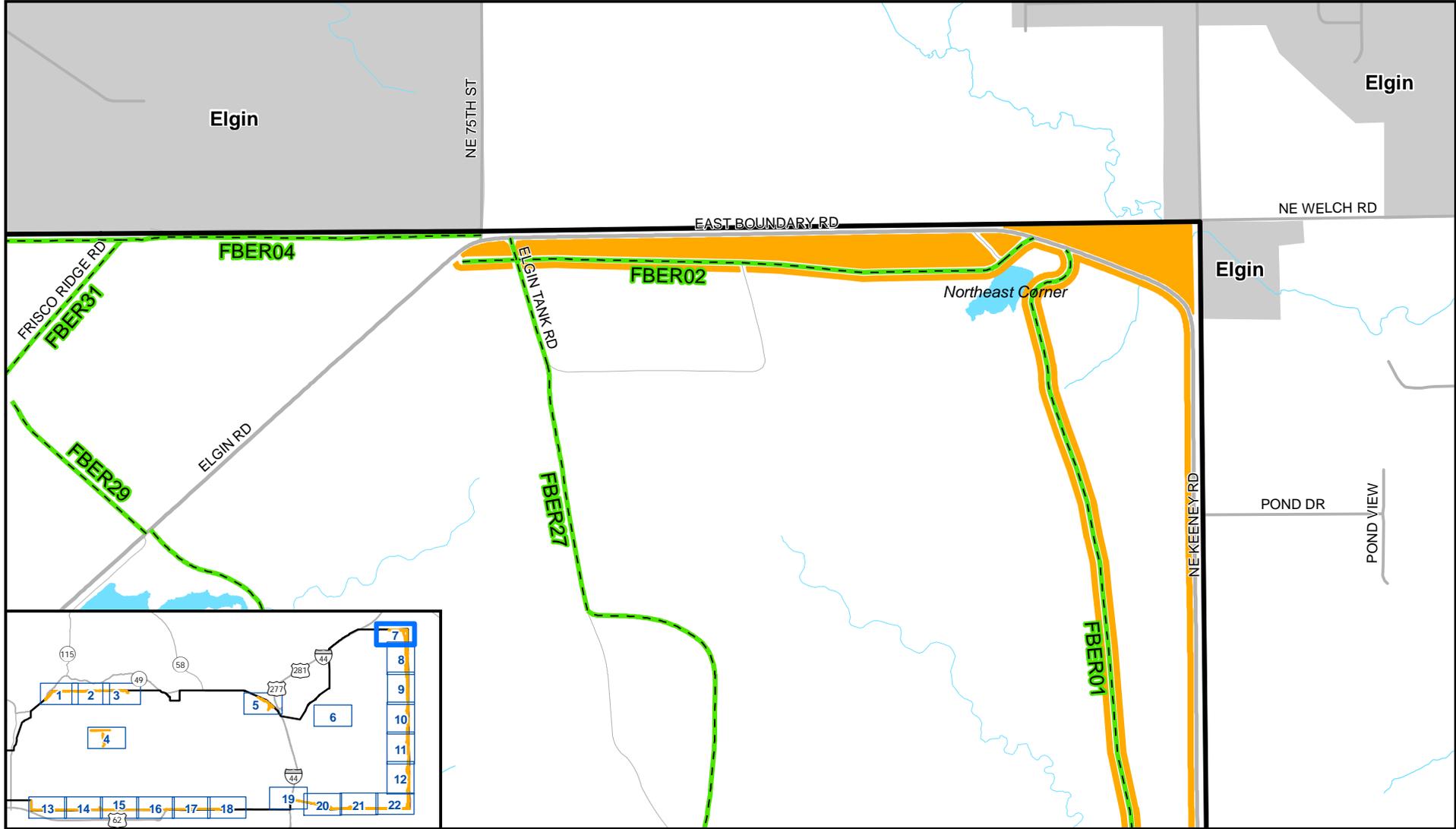
**Woody Vegetation  
 Removal Areas  
 Map 6**

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Figure A-6



N

0      500      1,000  
Feet

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**Legend**

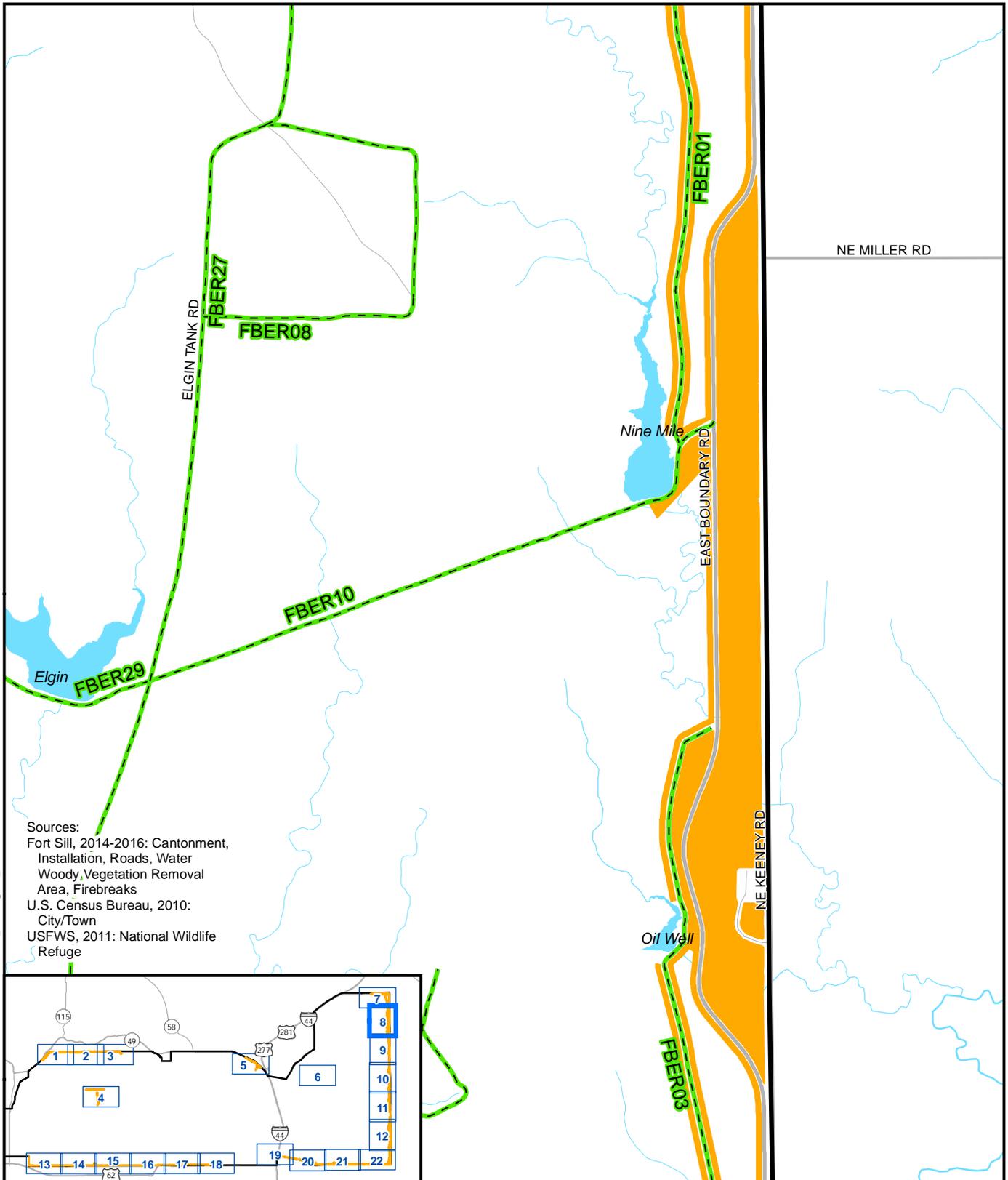
- Woody Vegetation Removal Area
- Existing Firebreak
- Fort Sill
- City/Town
- Water
- Road

Sources:  
 Fort Sill, 2014-2016: Cantonment, Installation, Roads, Water  
 Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

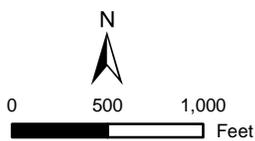
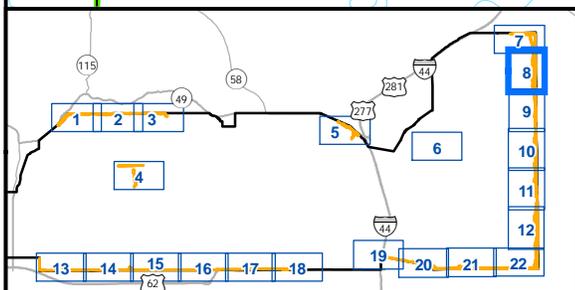
**Woody Vegetation  
Removal Areas  
Map 7**

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ENVIRONMENTAL ASSESSMENT

Date: 4/3/2016	Figure A-7
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Sources:  
 Fort Sill, 2014-2016: Cantonment, Installation, Roads, Water  
 Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge



- Legend**
- Woody Vegetation Removal Area
  - Existing Firebreak
  - Fort Sill
  - Water
  - Road

**Woody Vegetation  
Removal Areas  
Map 8**

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ENVIRONMENTAL ASSESSMENT

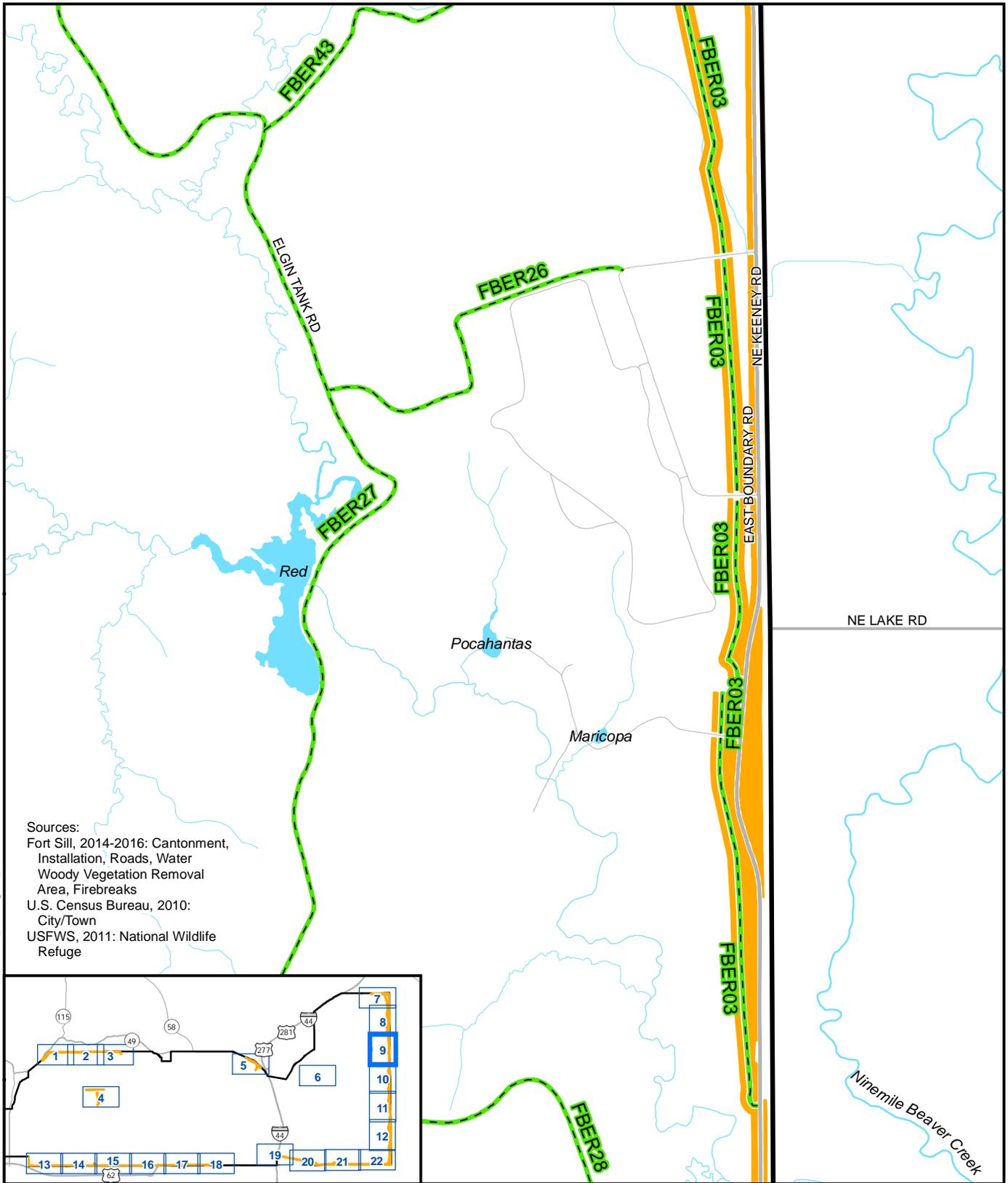
Date: 4/3/2016

Figure A-8

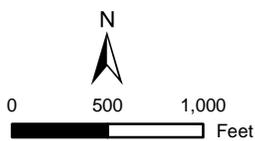
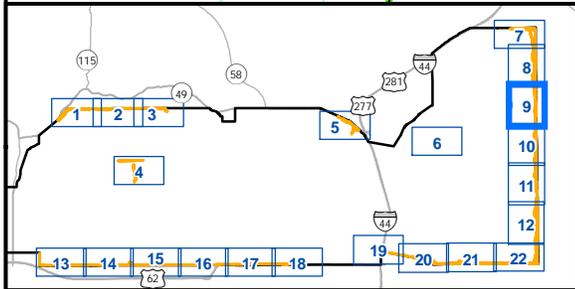


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Sources:  
 Fort Sill, 2014-2016: Cantonment, Installation, Roads, Water  
 Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge



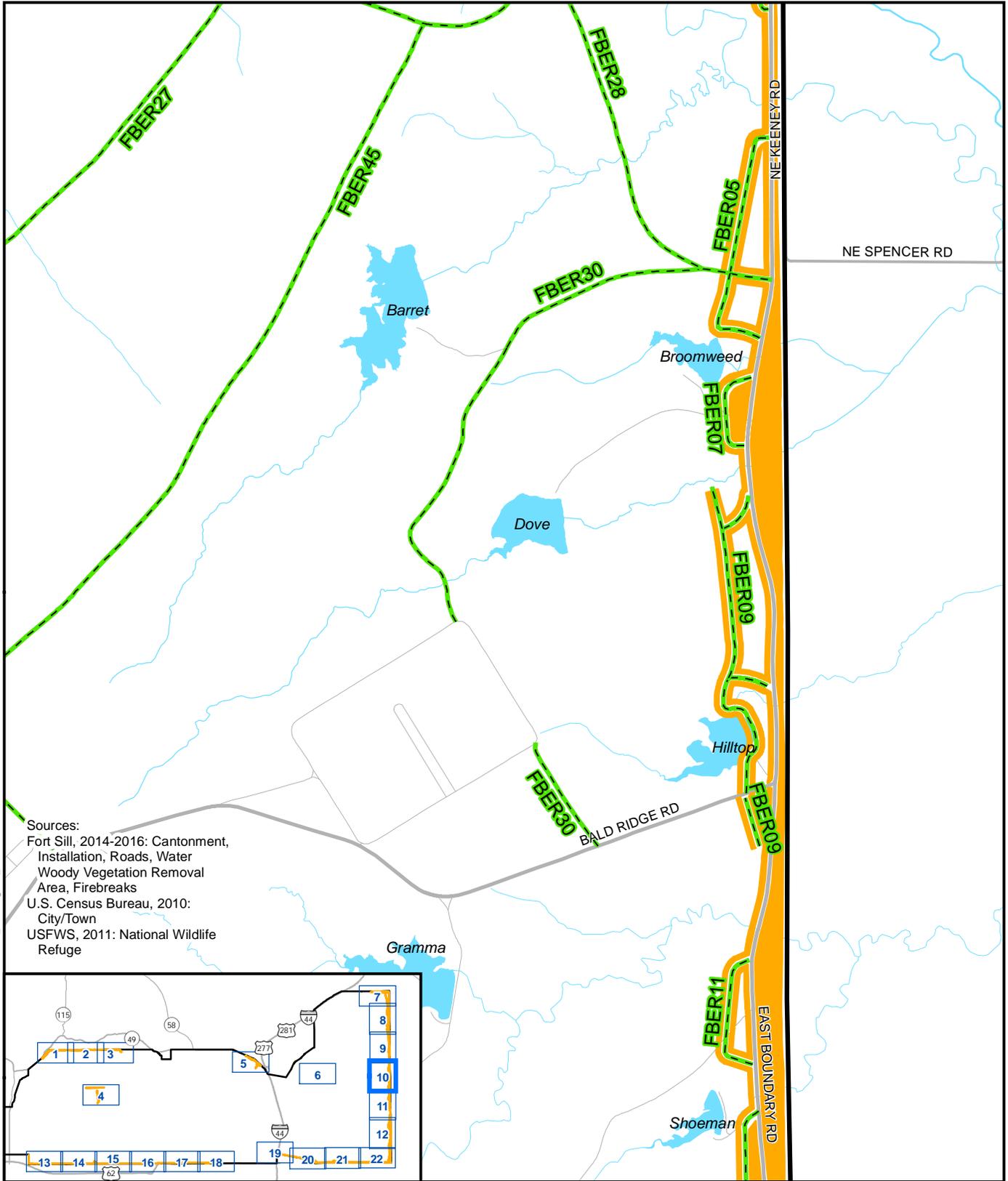
- Legend**
- Woody Vegetation Removal Area
  - Existing Firebreak
  - Fort Sill
  - Water
  - Road

**Woody Vegetation  
 Removal Areas  
 Map 9**

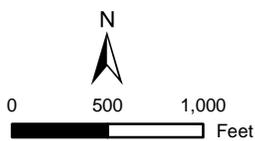
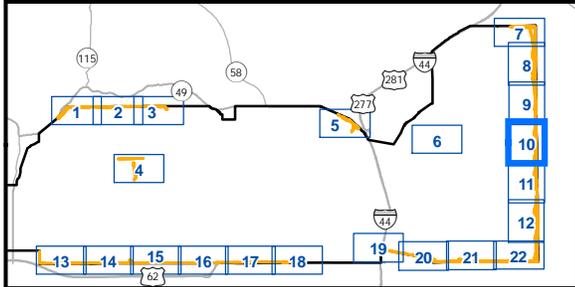
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Date: 4/3/2016 Figure A-9

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Sources:  
 Fort Sill, 2014-2016: Cantonment, Installation, Roads, Water  
 Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge



- Legend**
- Woody Vegetation Removal Area
  - Existing Firebreak
  - Fort Sill
  - Water
  - Road

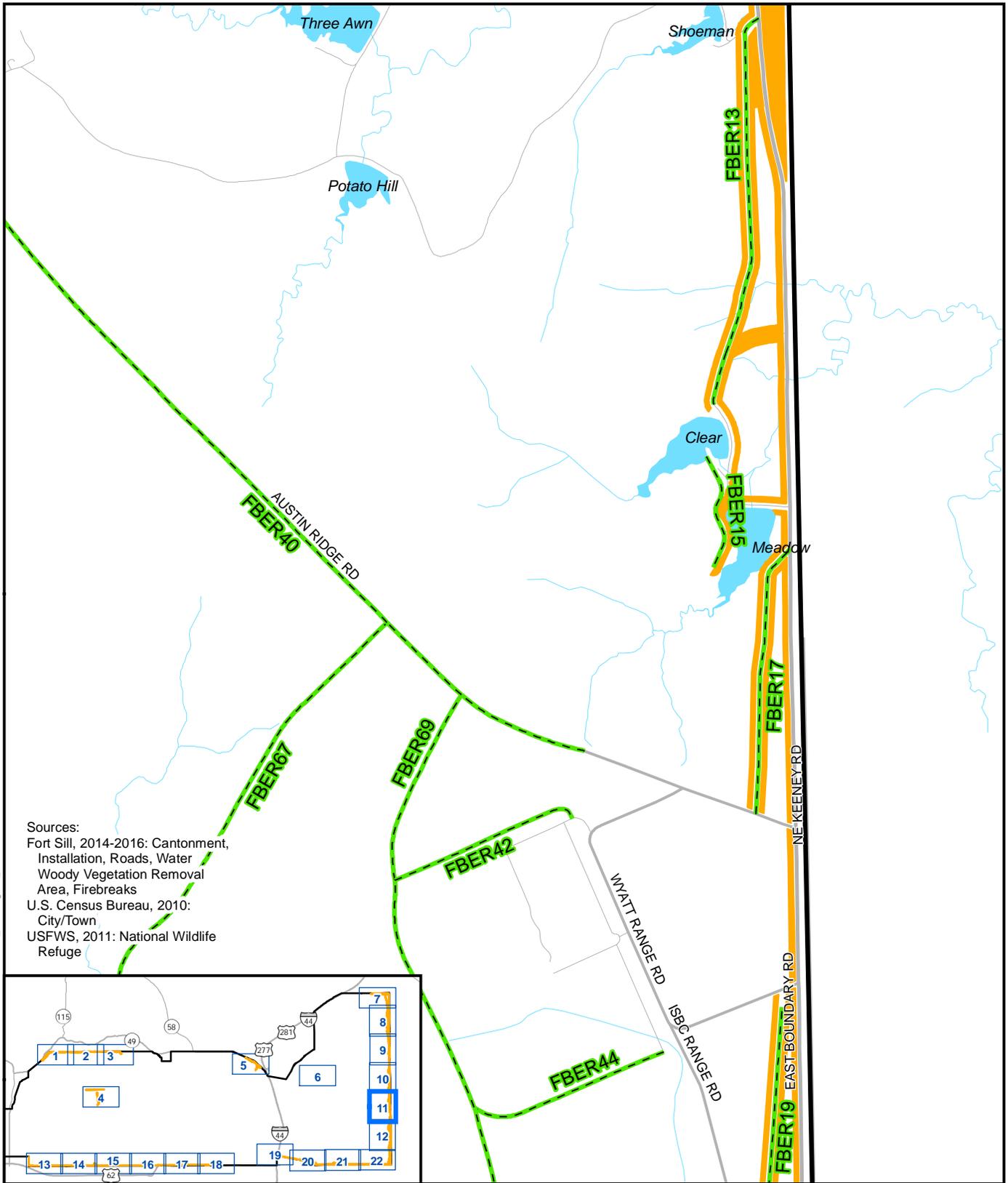
## Woody Vegetation Removal Areas Map 10

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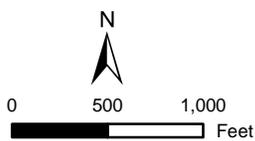
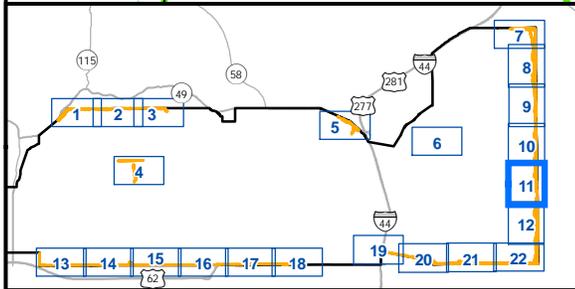
Date: 4/3/2016

Figure A-10

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Sources:  
 Fort Sill, 2014-2016: Cantonment, Installation, Roads, Water  
 Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge



- Legend**
- Woody Vegetation Removal Area
  - Existing Firebreak
  - Fort Sill
  - Water
  - Road

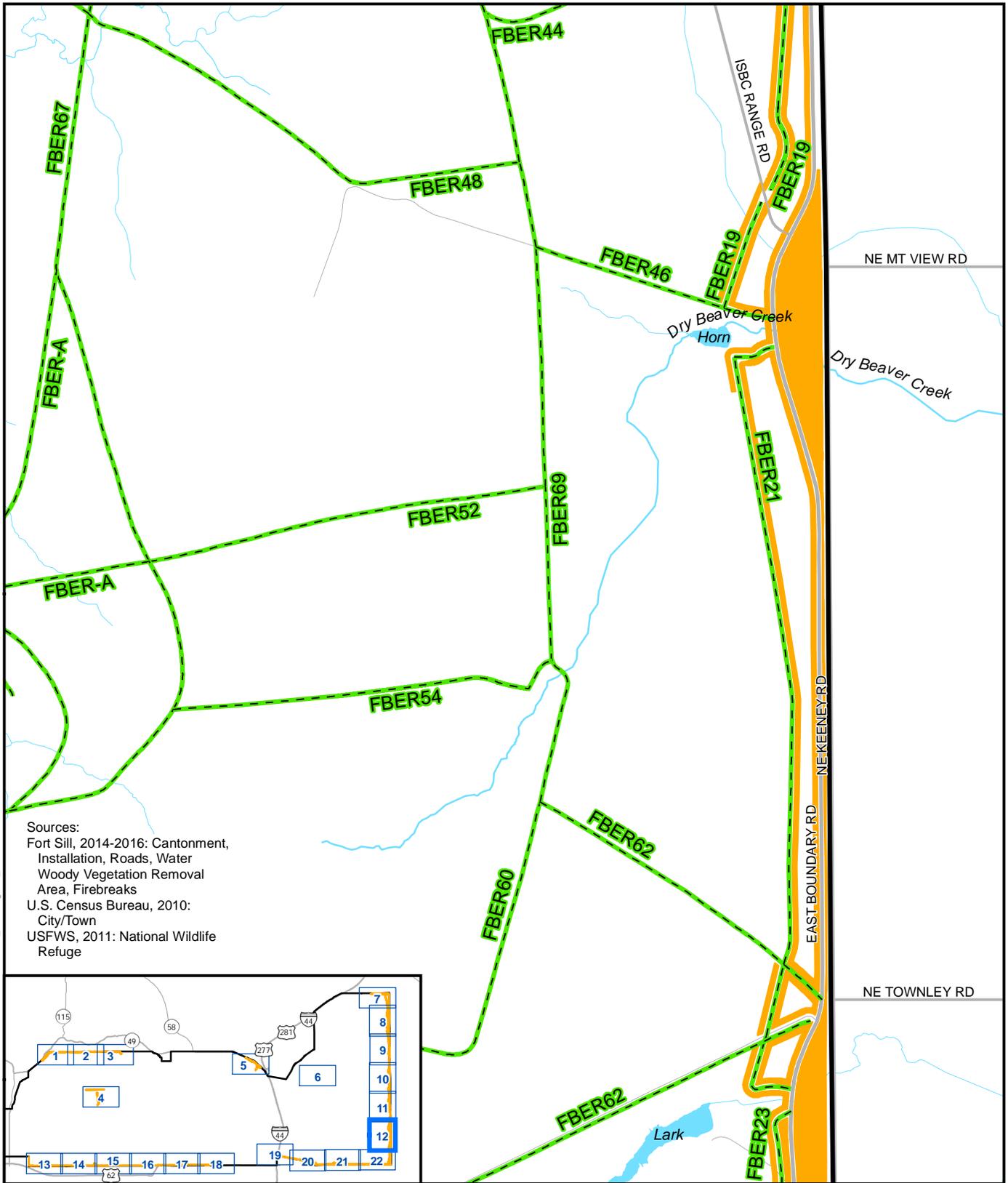
**Woody Vegetation  
Removal Areas  
Map 11**

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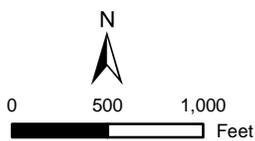
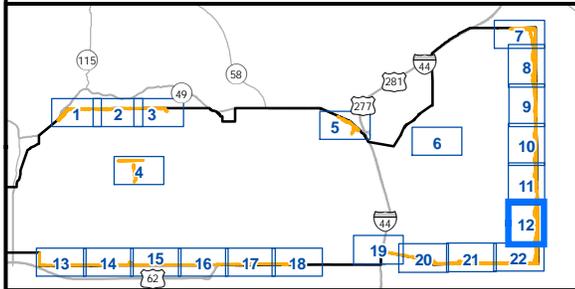
Date: 4/3/2016	Figure A-11
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Sources:  
 Fort Sill, 2014-2016: Cantonment, Installation, Roads, Water  
 Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge



- Legend
- Woody Vegetation Removal Area
  - Existing Firebreak
  - Fort Sill
  - Water
  - Road

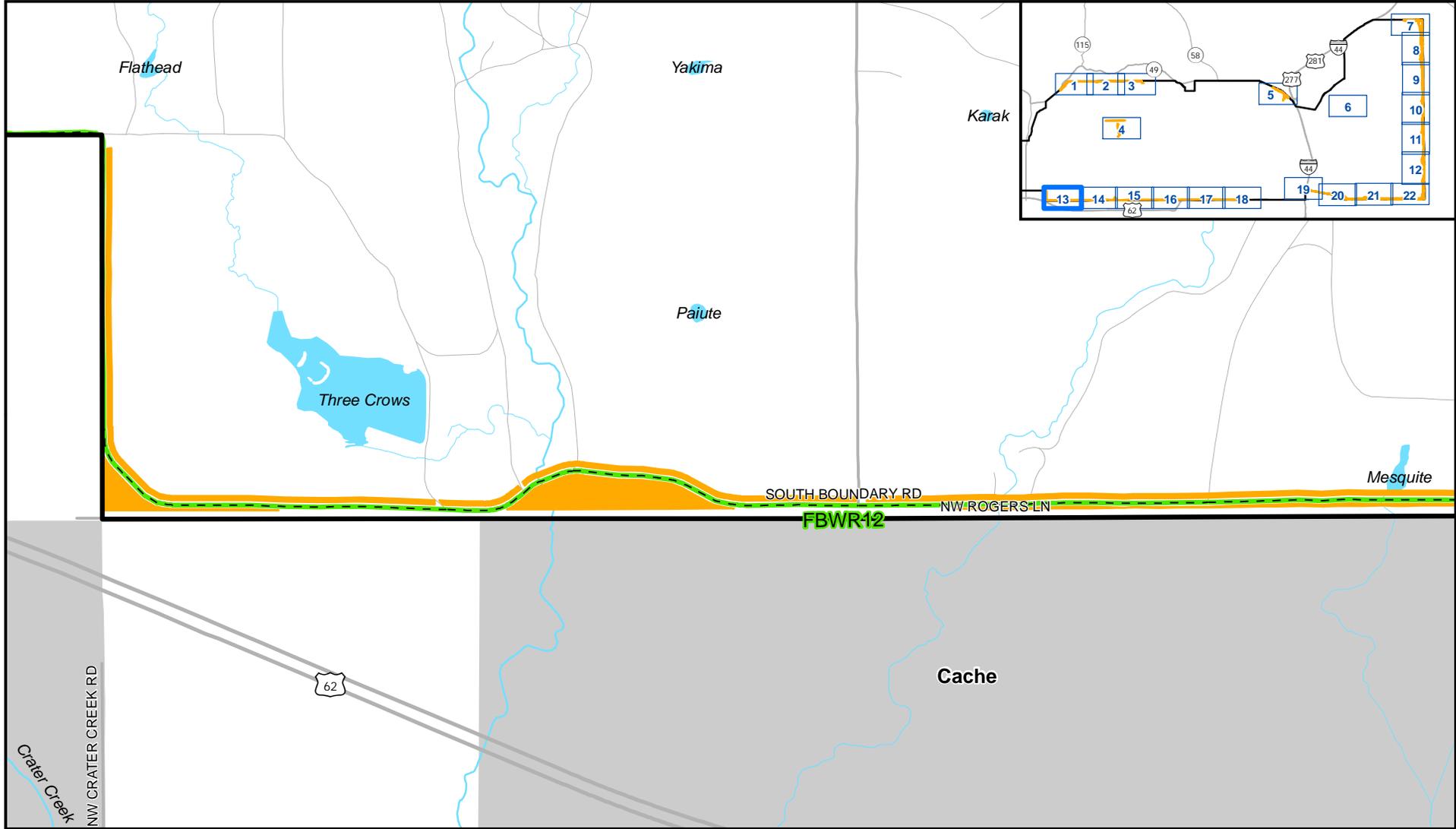
**Woody Vegetation  
 Removal Areas  
 Map 12**

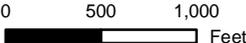
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Date: 4/3/2016 Figure A-12

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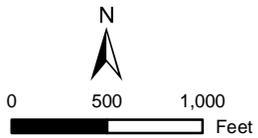
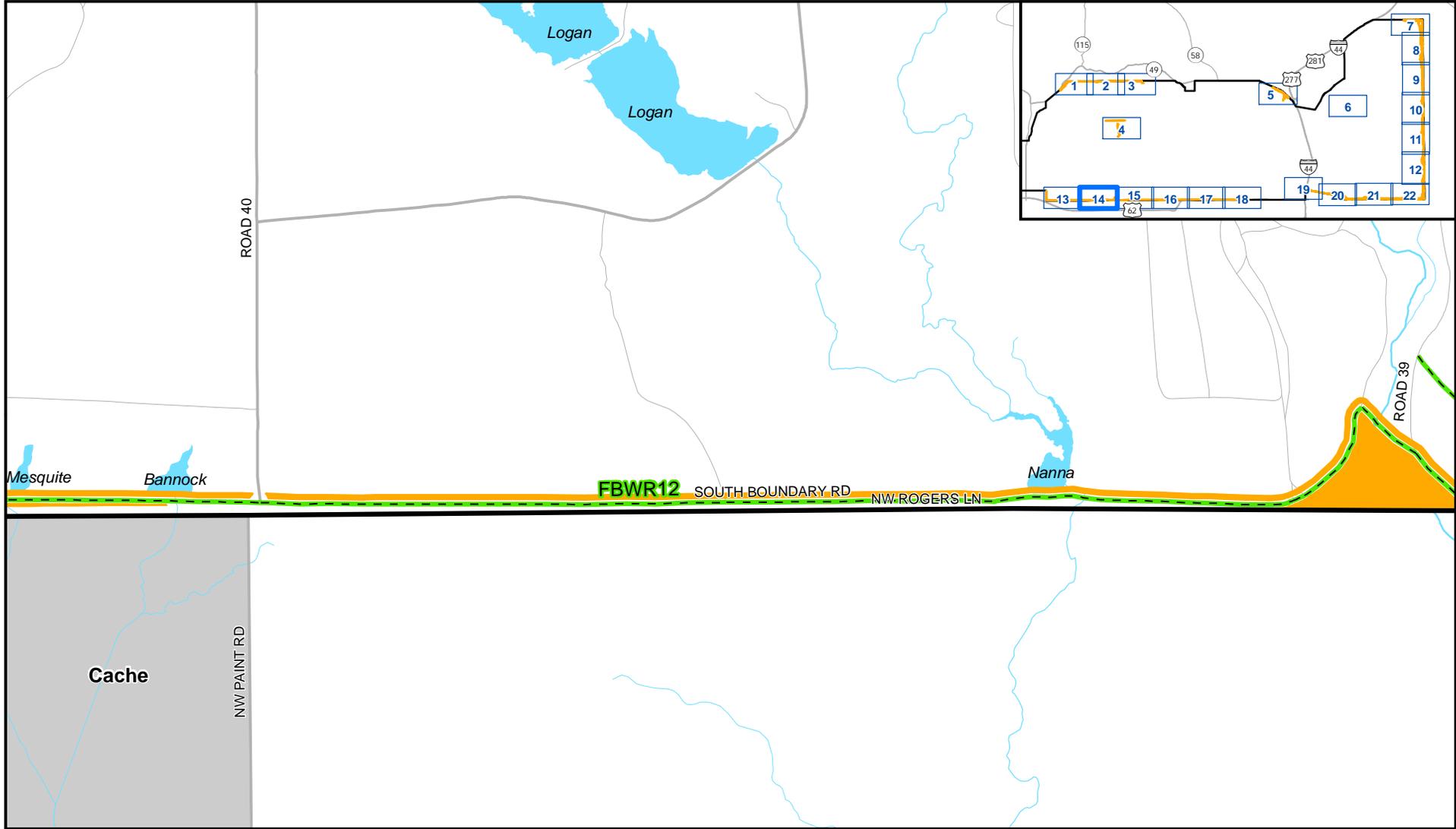
**Legend**

 Woody Vegetation Removal Area	 Fort Sill
 Existing Firebreak	 City/Town
	 Water
	 Road

**Sources:**  
 Fort Sill, 2014-2016: Cantonment, Installation, Roads, Water Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

**Woody Vegetation Removal Areas**  
**Map 13**  
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Date: 4/3/2016	Figure A-13
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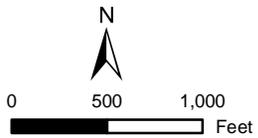
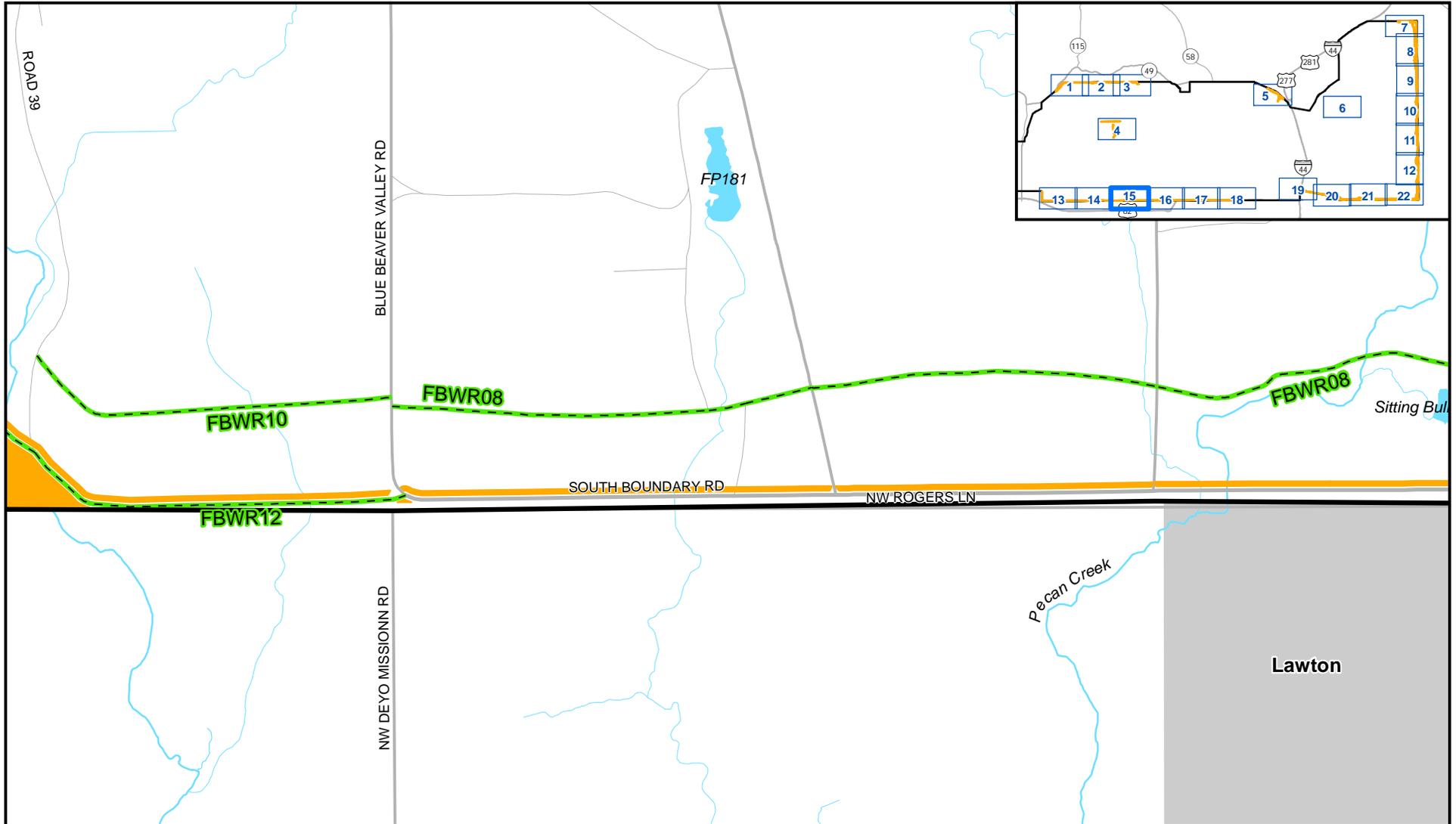


- Legend**
- Woody Vegetation Removal Area
  - Existing Firebreak
  - Fort Sill
  - City/Town
  - Road
  - Water

Sources:  
 Fort Sill, 2014-2016: Cantonment, Installation, Roads, Water  
 Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

**Woody Vegetation  
 Removal Areas  
 Map 14**

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**Legend**

- Woody Vegetation Removal Area
- Existing Firebreak
- Fort Sill
- City/Town
- Water
- Road

Sources:  
 Fort Sill, 2014-2016: Cantonment, Installation, Roads, Water  
 Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

**Woody Vegetation Removal Areas  
 Map 15**

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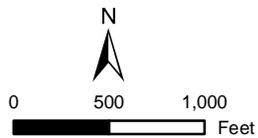
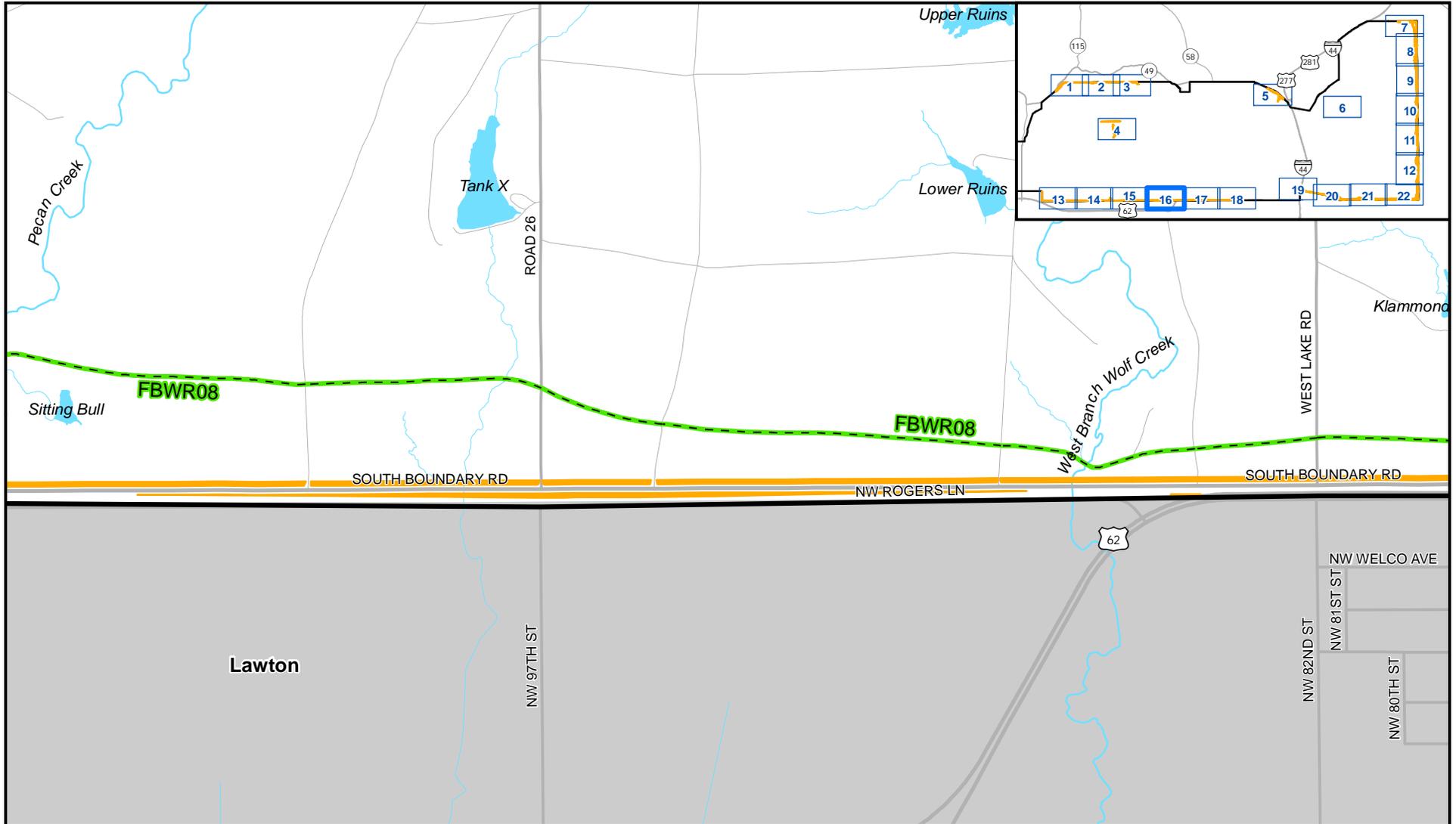
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Figure A-15



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**Legend**

- Woody Vegetation Removal Area
- Existing Firebreak
- Fort Sill
- City/Town
- Water
- Road

Sources:  
 Fort Sill, 2014-2016: Cantonment, Installation, Roads, Water  
 Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

**Woody Vegetation  
 Removal Areas  
 Map 16**

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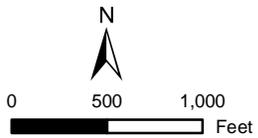
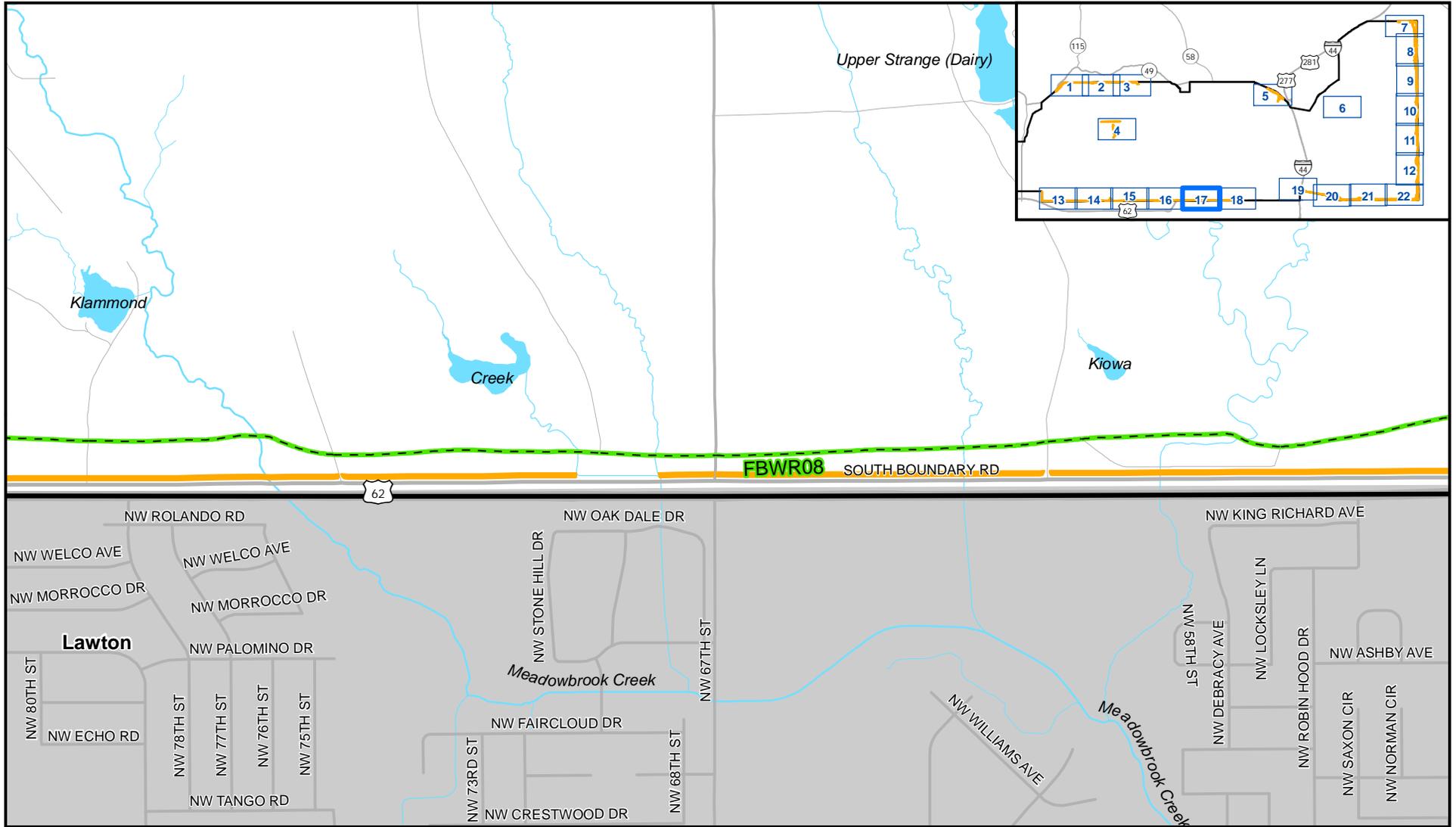
Date: 4/3/2016

Figure A-16



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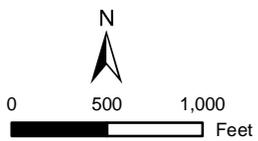
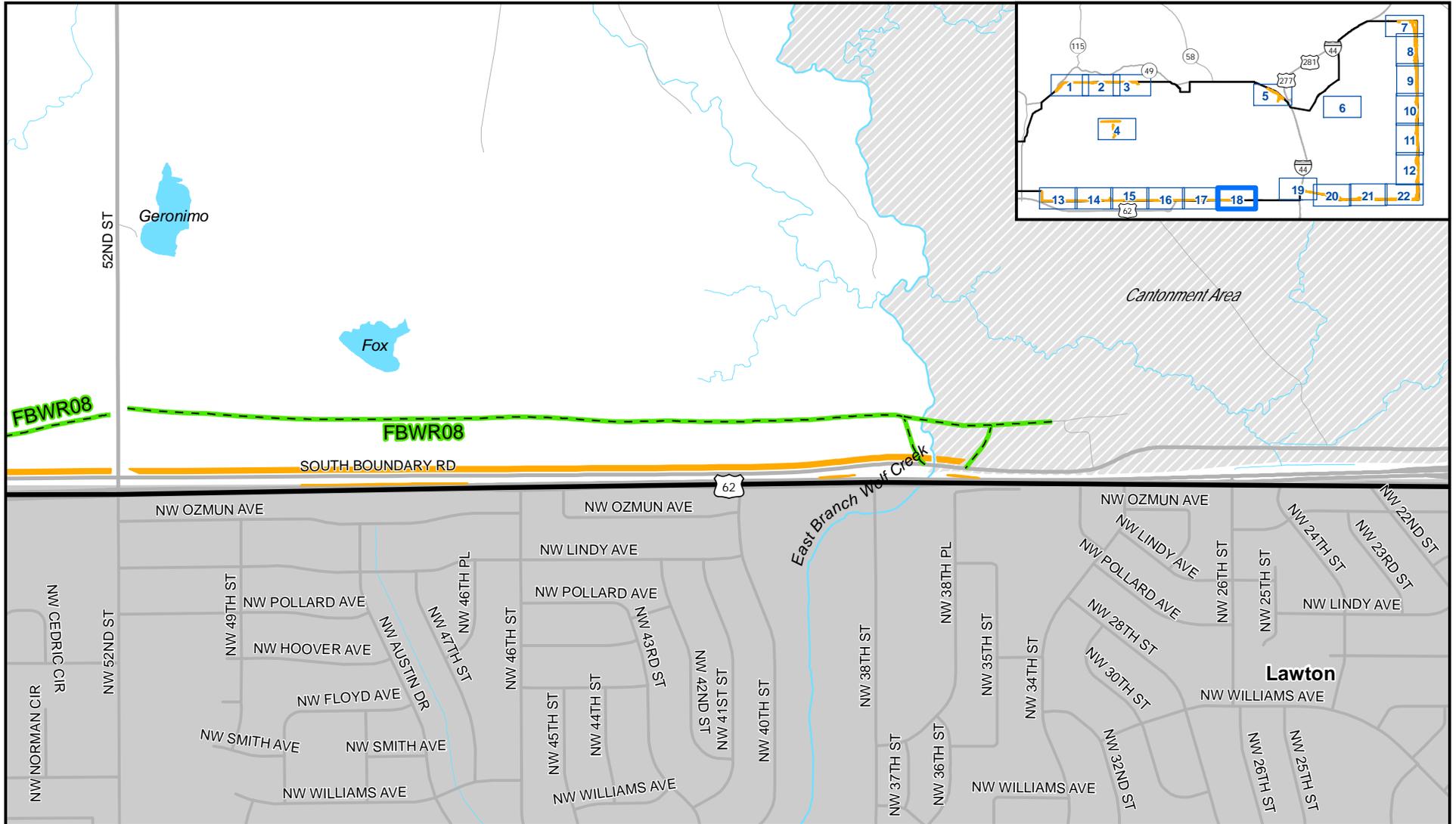


- Legend**
- Woody Vegetation Removal Area
  - Existing Firebreak
  - Fort Sill
  - City/Town
  - Water
  - Road

Sources:  
 Fort Sill, 2014-2016: Cantonment, Installation, Roads, Water Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

**Woody Vegetation  
 Removal Areas  
 Map 17**

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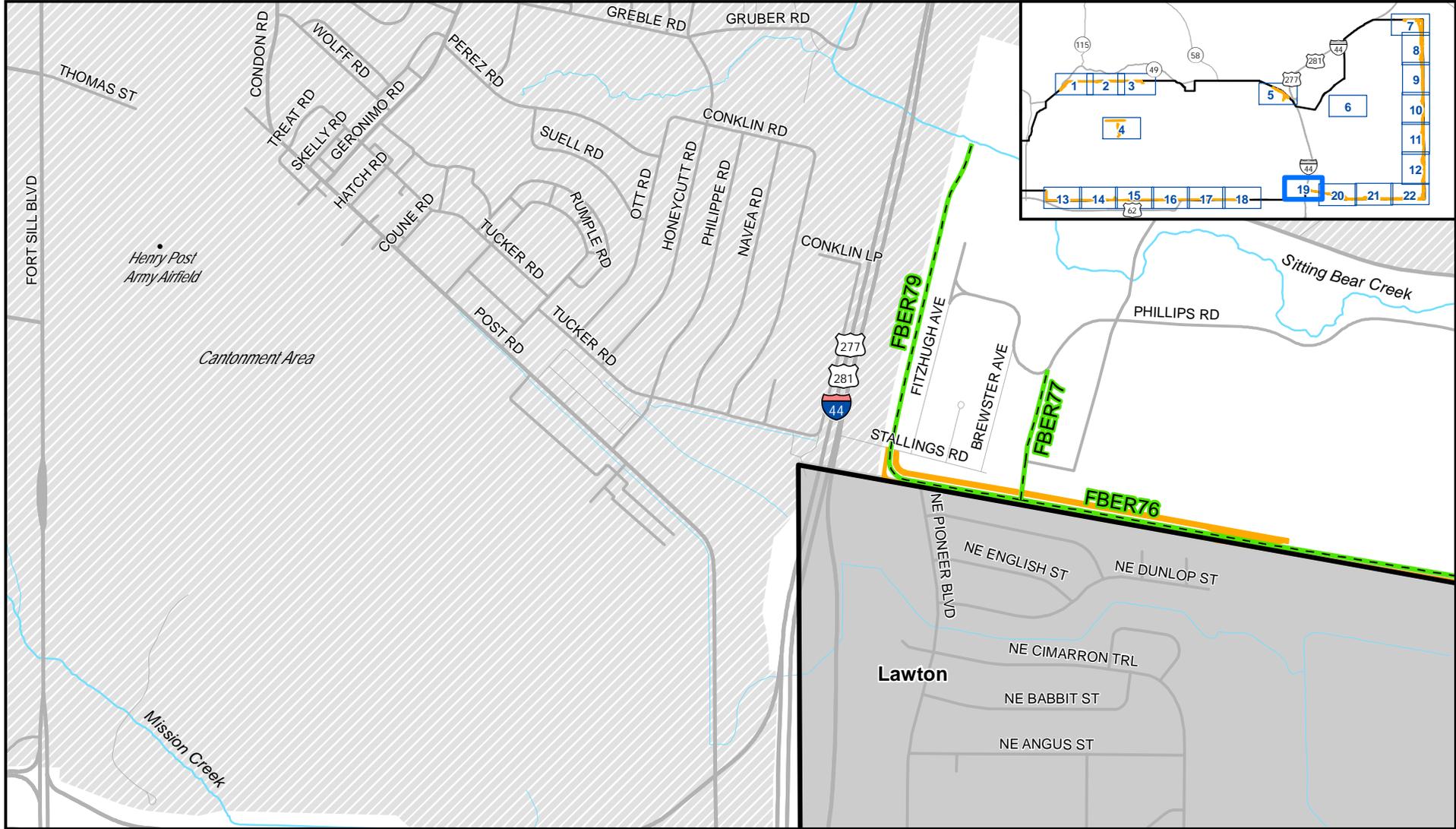


- Legend**
- Woody Vegetation Removal Area
  - Existing Firebreak
  - Fort Sill
  - City/Town
  - Cantonment Area
  - Water
  - Road

**Sources:**  
 Fort Sill, 2014-2016: Cantonment, Installation, Roads, Water Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

**Woody Vegetation Removal Areas**  
**Map 18**  
 DRAFT ENVIRONMENTAL ASSESSMENT

Date: 4/3/2016      Figure A-18



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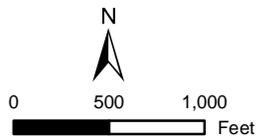
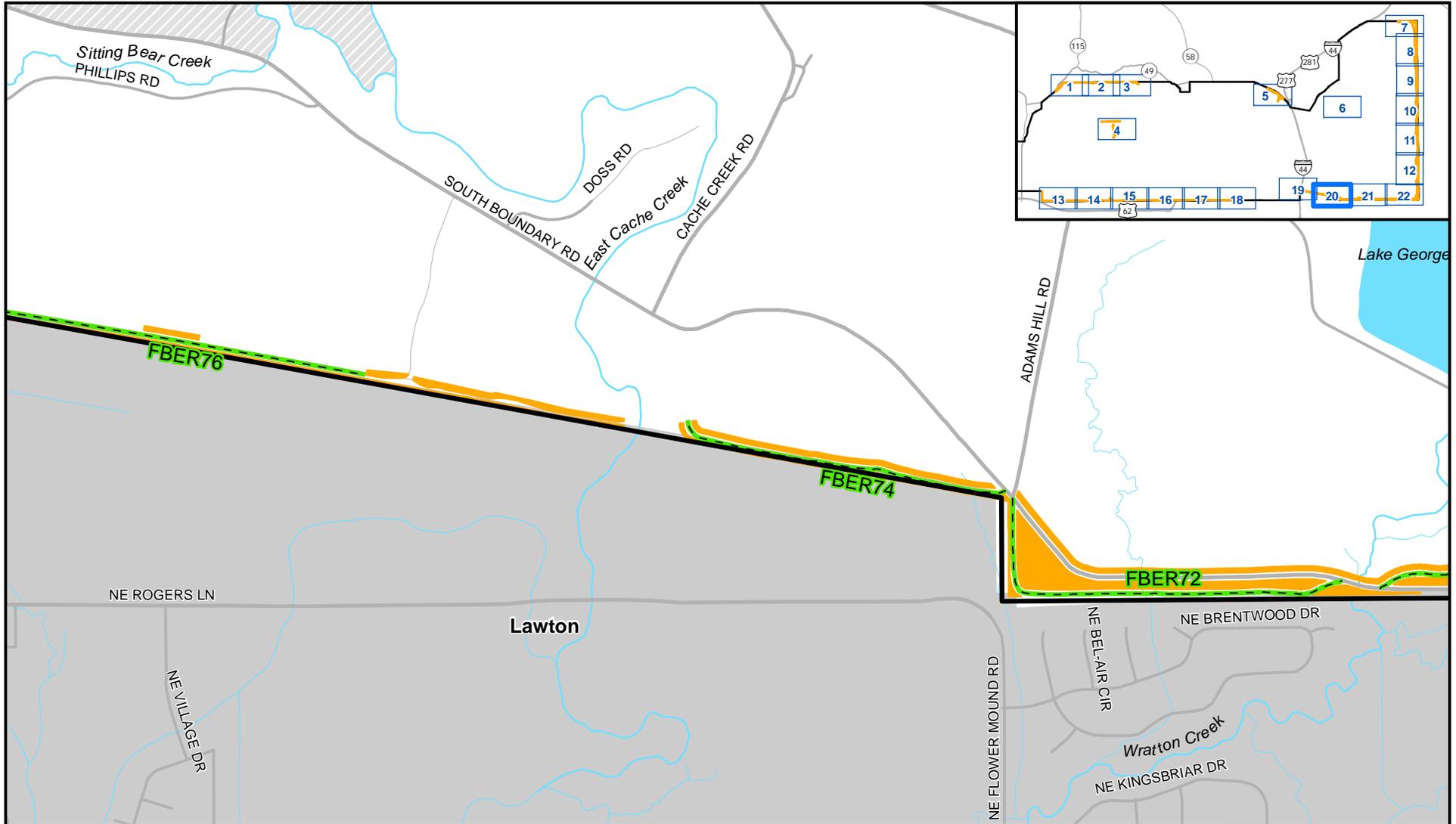
Woody Vegetation Removal Area	Fort Sill
Existing Firebreak	City/Town
	Cantonment Area
	Water
	Road

Sources:  
 Fort Sill, 2014-2016: Cantonment, Installation, Roads, Water Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

**Woody Vegetation Removal Areas**  
**Map 19**

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Date: 4/3/2016	Figure A-19
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**Legend**

- Woody Vegetation Removal Area
- Existing Firebreak
- Fort Sill
- City/Town
- Cantonment Area
- Water
- Road

Sources:  
 Fort Sill, 2014-2016: Cantonment, Installation, Roads, Water  
 Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

**Woody Vegetation Removal Areas  
 Map 20**

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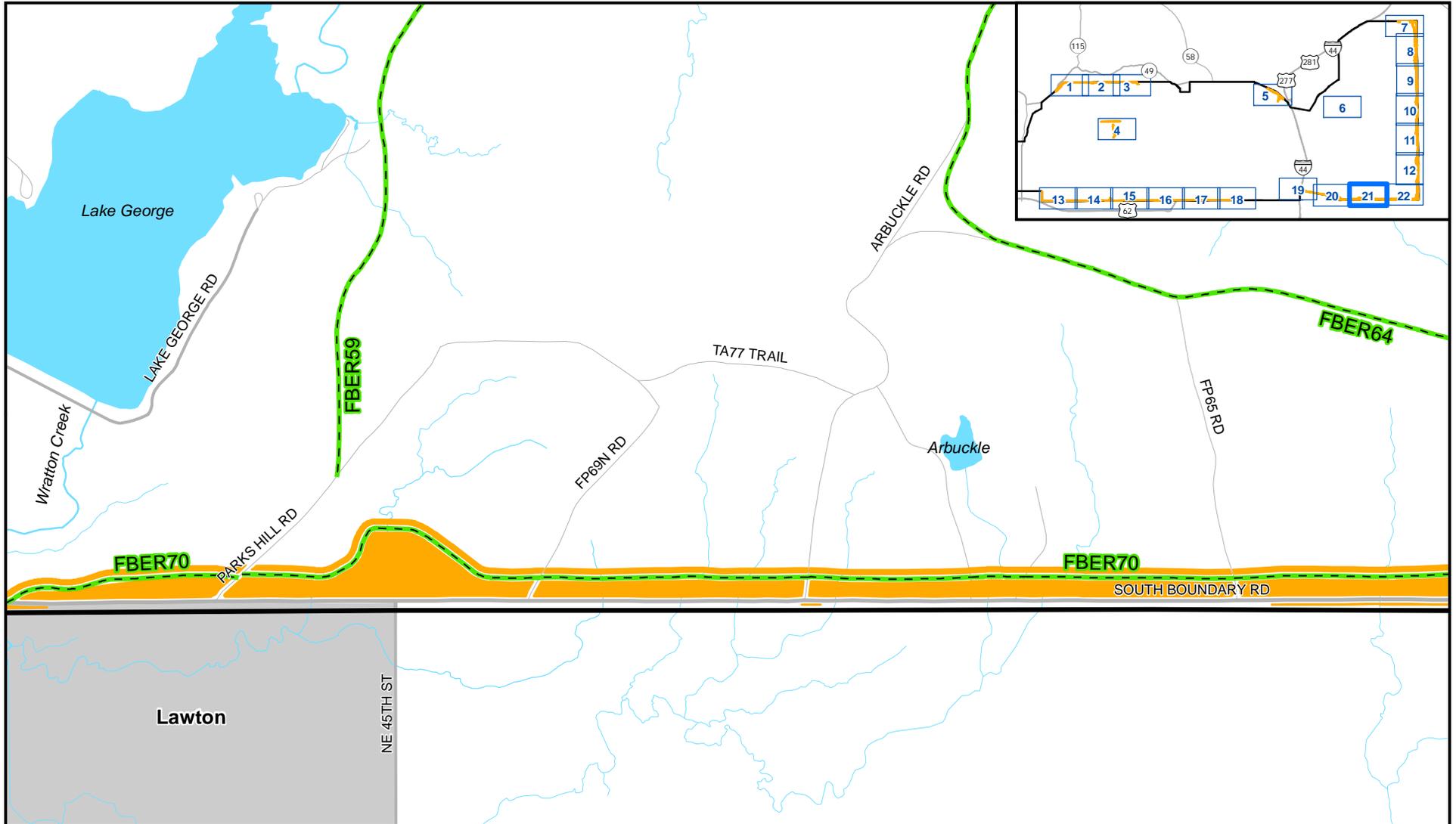
Date: 4/3/2016

Figure A-20



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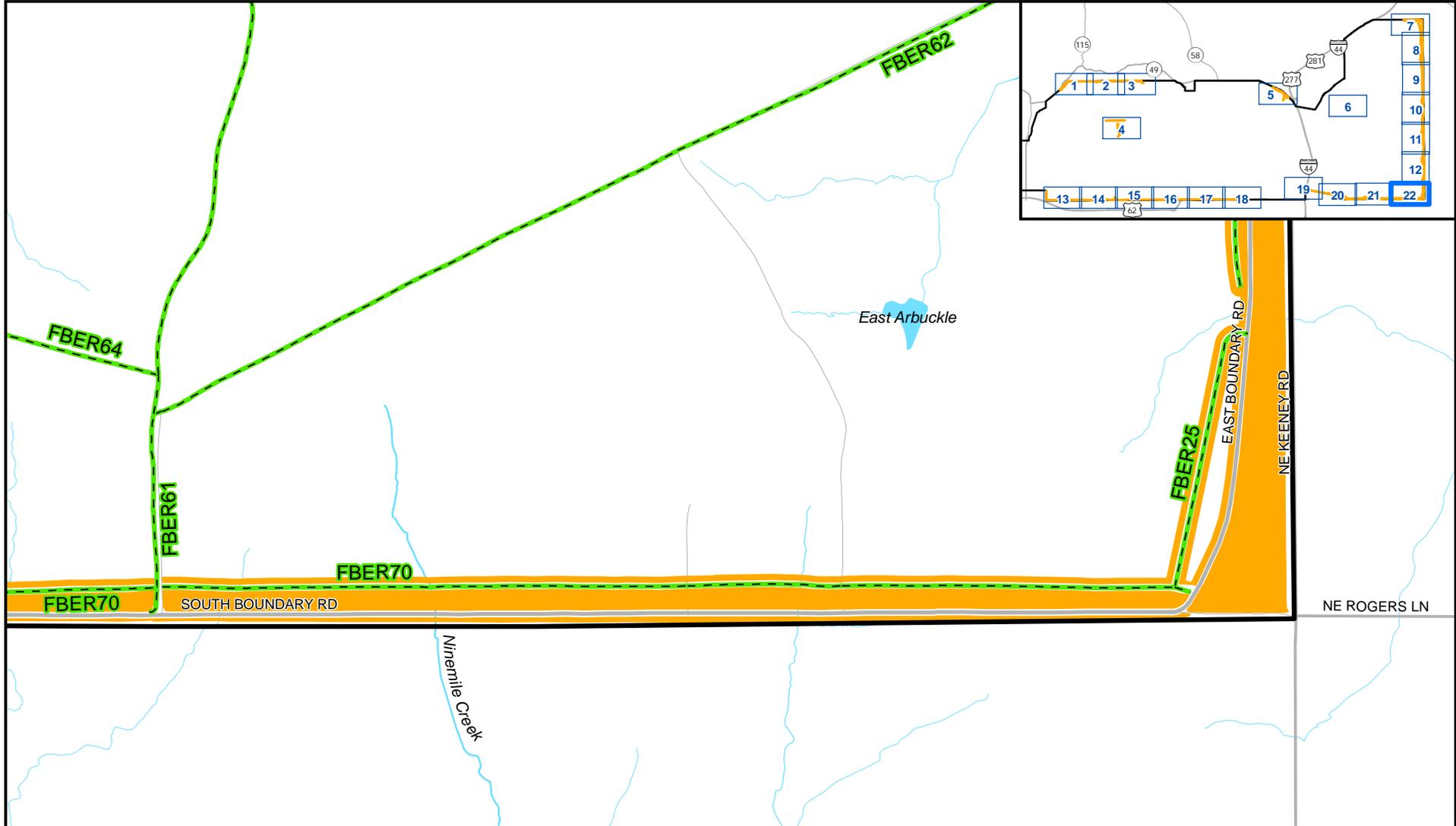
**Legend**

 Woody Vegetation Removal Area	 Fort Sill
 Existing Firebreak	 City/Town
	 Water
	 Road

**Sources:**  
 Fort Sill, 2014-2016: Cantonment, Installation, Roads, Water  
 Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

**Woody Vegetation Removal Areas**  
**Map 21**  
 DRAFT ENVIRONMENTAL ASSESSMENT

Date: 4/3/2016	Figure A-21
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**Legend**

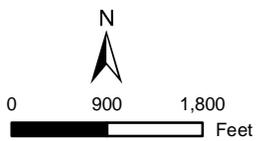
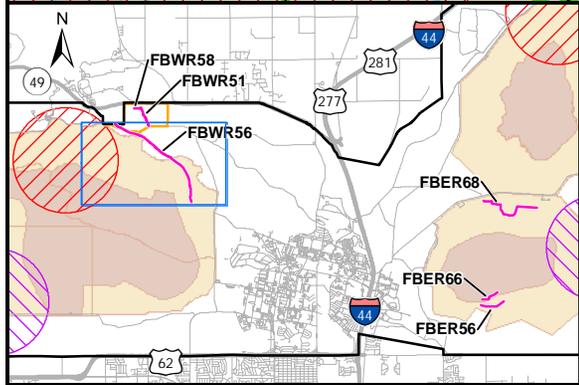
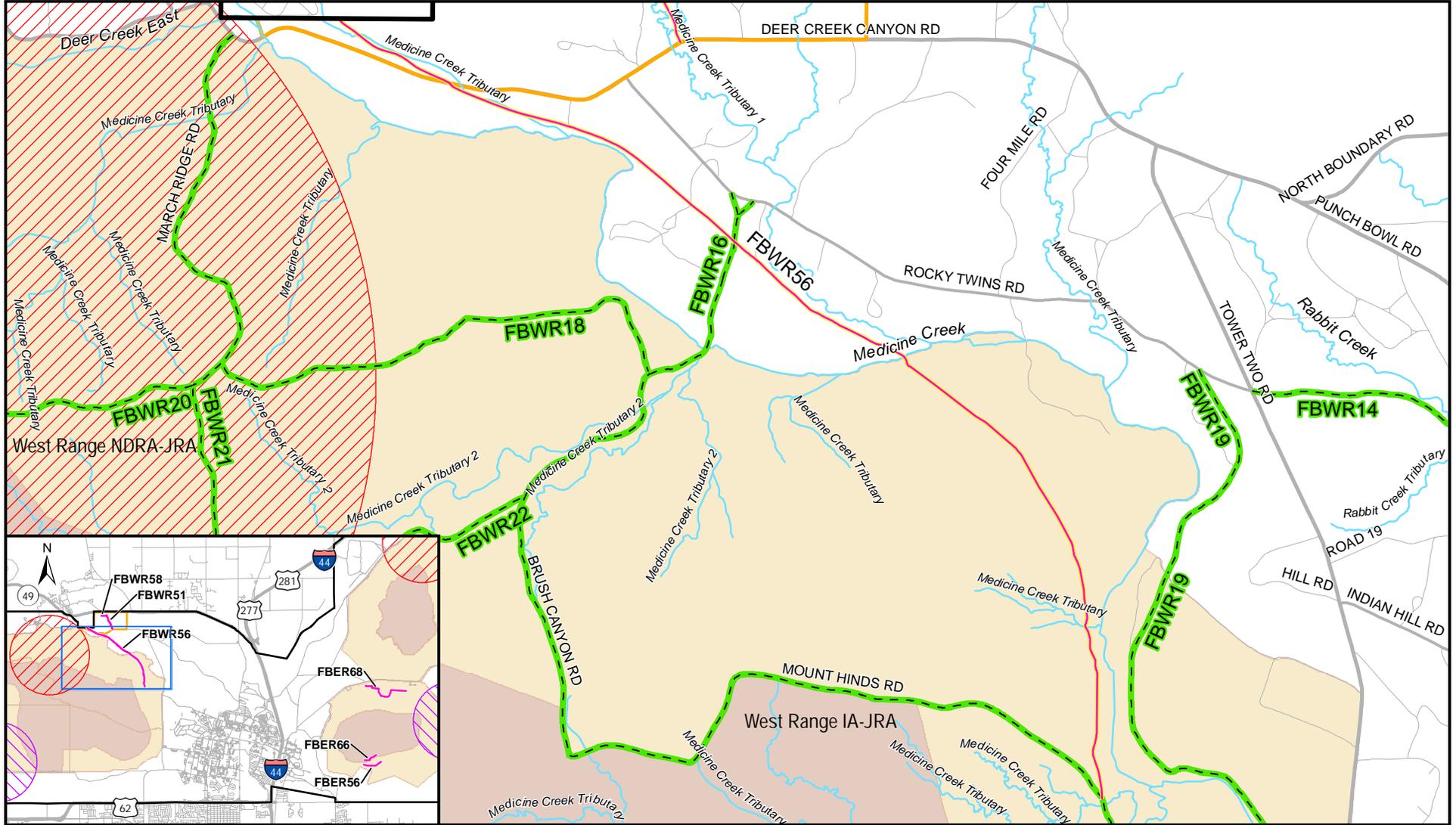
Woody Vegetation Removal Area	Fort Sill
Existing Firebreak	Water
	Road

Sources:  
 Fort Sill, 2014-2016: Cantonment, Installation, Roads, Water  
 Woody Vegetation Removal Area, Firebreaks  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

**Woody Vegetation  
Removal Areas  
Map 22**

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Date: 4/3/2016	Figure A-22
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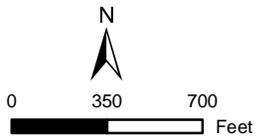
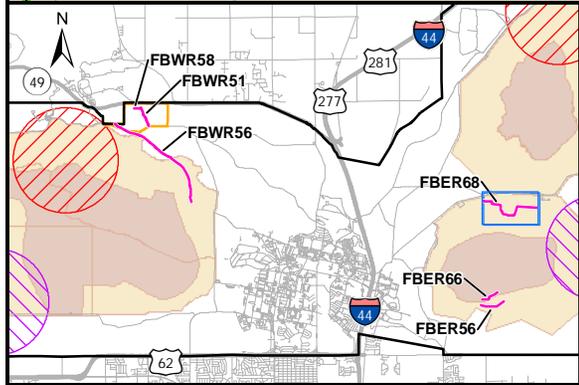
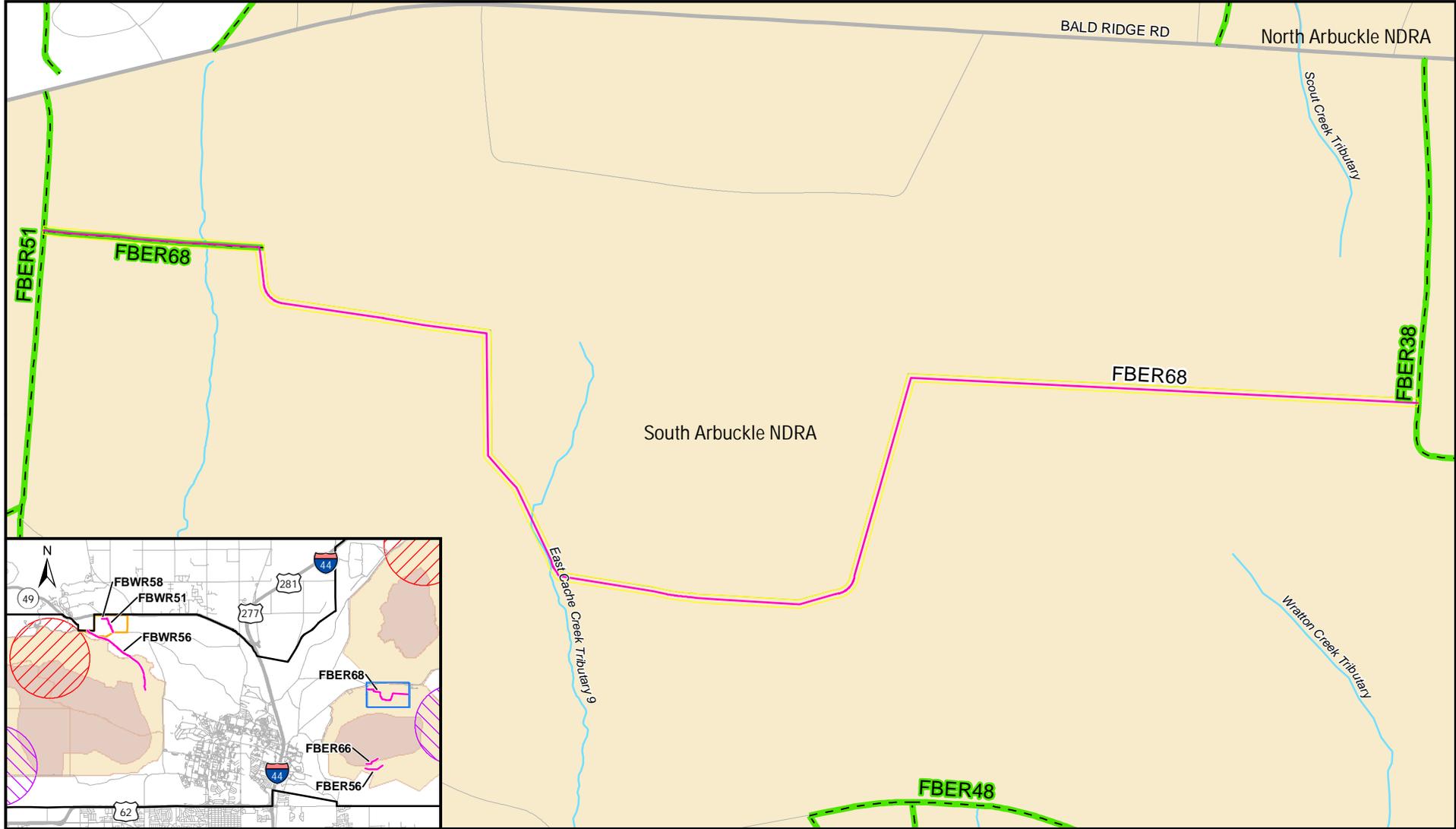


- Legend**
- Proposed Firebreak
  - Firebreak Buffer (40-foot corridor)
  - Existing Firebreak
  - Training Area 39
  - Dudded Impact Area (IA)
  - Non-Dudded Range Area (NDRA)
  - Fast Moving Fire Risk Area
  - Tracer Round Risk Area
  - Road
  - Stream
  - Fort Sill

Sources:  
 Fort Sill, 2014-2016:  
 Firebreaks, Impact Areas,  
 Installation, Risk Areas,  
 Roads, Training Area,  
 Water  
 URS, 2016: Firebreak Buffer

**Proposed Action:**  
**Firebreak**  
**FBWR56**

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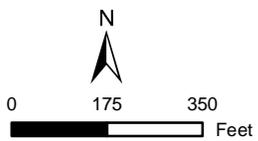
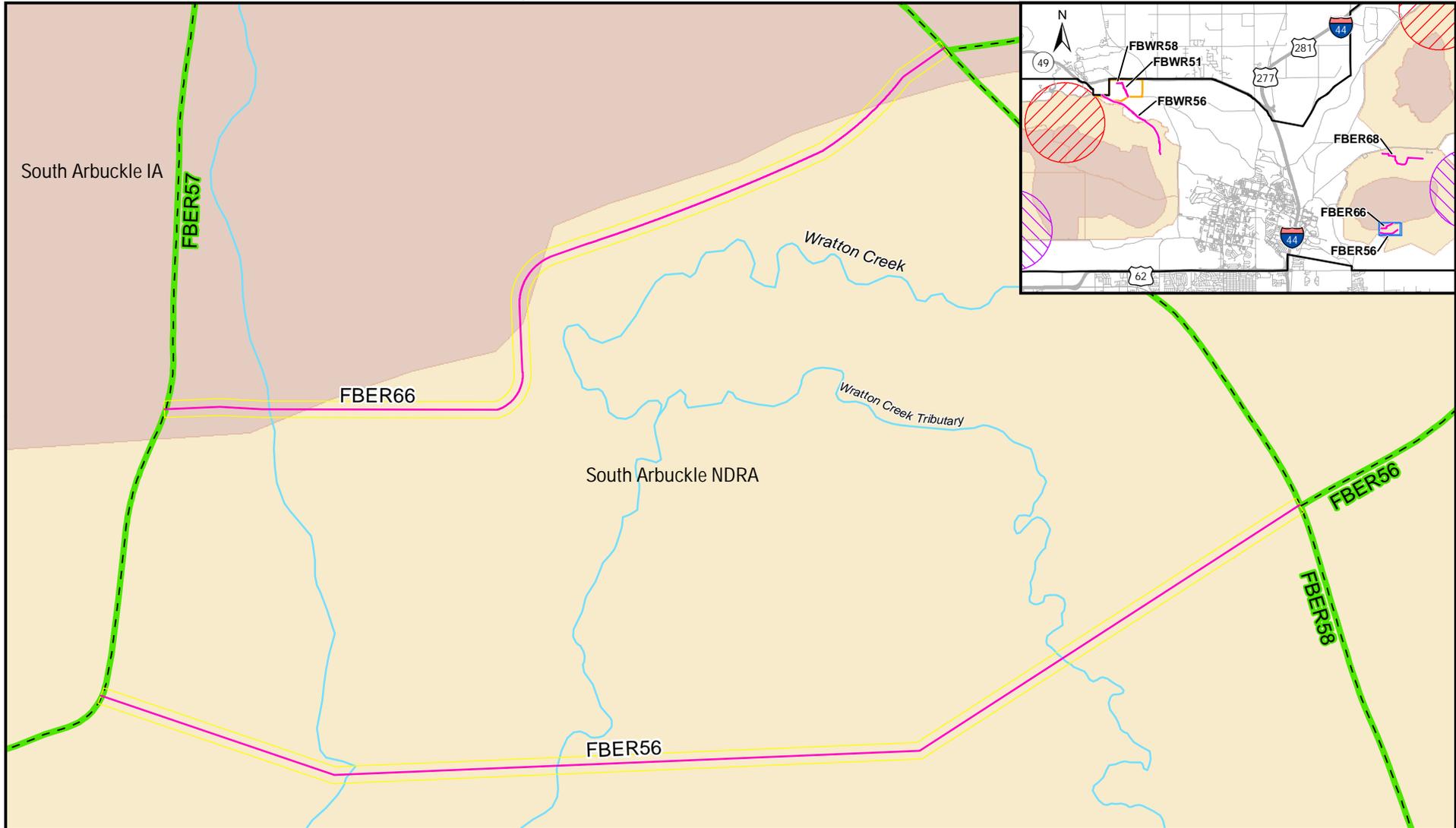


- Legend**
- Proposed Firebreak
  - Firebreak Buffer (40-foot corridor)
  - Existing Firebreak
  - Training Area 39
  - Duded Impact Area (IA)
  - Non-Duded Range Area (NDRA)
  - Fast Moving Fire Risk Area
  - Tracer Round Risk Area
  - Road
  - Stream
  - Fort Sill

Sources:  
 Fort Sill, 2014-2016:  
 Firebreaks, Impact Areas,  
 Installation, Risk Areas,  
 Roads, Training Area,  
 Water  
 URS, 2016: Firebreak Buffer

**Proposed Action:**  
**Firebreak**  
**FBER68**

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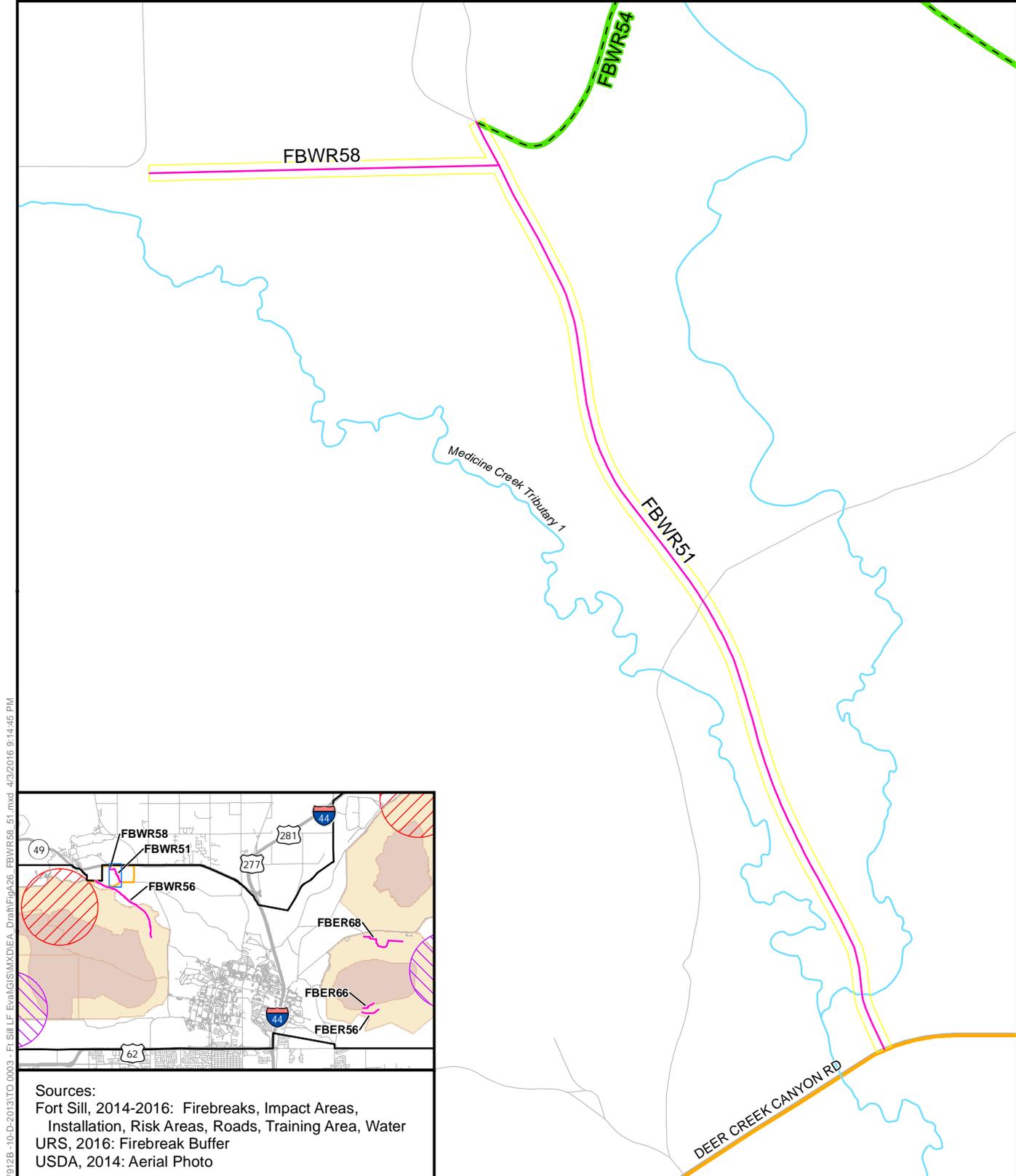


- Legend**
- Proposed Firebreak
  - Firebreak Buffer (40-foot corridor)
  - - - Existing Firebreak
  - Training Area 39
  - Dudded Impact Area (IA)
  - Non-Dudded Range Area (NDRA)
  - Fast Moving Fire Risk Area
  - Tracer Round Risk Area
  - Road
  - Stream
  - Fort Sill

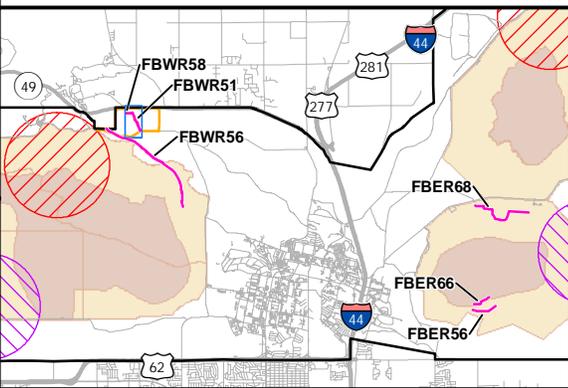
Sources:  
 Fort Sill, 2014-2016:  
 Firebreaks, Impact Areas,  
 Installation, Risk Areas,  
 Roads, Training Area,  
 Water  
 URS, 2016: Firebreak Buffer

**Proposed Action:  
 Firebreaks FBER66  
 and FBER56**

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**Sources:**  
 Fort Sill, 2014-2016: Firebreaks, Impact Areas, Installation, Risk Areas, Roads, Training Area, Water  
 URS, 2016: Firebreak Buffer  
 USDA, 2014: Aerial Photo



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Legend	
	Proposed Firebreak
	Firebreak Buffer (40-foot corridor)
	Existing Firebreak
	Training Area 39
	Duded Impact Area (IA)
	Non-Duded Range Area (NDRA)
	Fast Moving Fire Risk Area
	Tracer Round Risk Area
	Road
	Stream
	Fort Sill

**Proposed Action:**  
**Firebreaks FBWR58**  
**and FBWR51**

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Date: 4/3/2016	Figure A-26
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**Appendix B**  
**Agency Correspondence**



**DEPARTMENT OF THE ARMY**  
**US ARMY INSTALLATION MANAGEMENT COMMAND**  
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL**  
**2515 Ringgold ROAD**  
**FORT SILL, OKLAHOMA 73503**

August 25, 2015  
(Via mail)

**SUBJECT: City of Cache - City Hall Coordination Letter**  
**Fire Mitigation Environmental Assessment**  
**U.S. Army Garrison Fort Sill, Oklahoma (Comanche County)**

The Honorable Shawn Komahcheet  
Mayor of Cache  
City of Cache - City Hall  
404 W. "C" Avenue  
Cache, OK 73527

Dear Mayor Komahcheet:

The U.S. Army Garrison Fort Sill, Oklahoma (Installation or Ft. Sill) is located in Comanche County in southwestern Oklahoma about 50 miles north of Wichita Falls and 90 southwest of Oklahoma City (Figure 1). The Installation adjoins Cache and Lawton and the town of Indianoma on the south and Elgin and the town of Medicine Park on the north. The Wichita Mountains National Wildlife Refuge (NWR) is located adjacent to the Installation's northwestern property boundary.

Fort Sill is preparing an Environmental Assessment (EA) to evaluate the effects of additional, proposed fire mitigation measures to be implemented at the East and West Training Ranges of the Installation. The Installation extends 27 miles in an east-west direction, four to nine miles in a north-south direction, and consists of 93,641 acres of land. The Installation includes military quarters, support areas, and almost 86,000 acres of range land devoted to U.S. military training activities conducted in accordance with Department of Defense (DoD) readiness requirements. Of the 86,000 acres of available range land, more than 48,000 acres is used for training and the remaining 38,000 acres are called impact areas, used for ordnance training and ordnance demolition activities. Approximately 73,000 acres of the existing Training Ranges are used year round for live-fire training and military exercises; live ordnance is fired at the target or impact area which may also include demolition training activities. Unexploded ordnance (UXO) is present on both training ranges at unmaped locations.

This letter requests agency and public stakeholder comment on the proposed fire mitigation activities contemplated by the Installation to provide increased fire protection for the Installation and nearby communities by helping prevent the spread of wild fires and minimizing public health risks posed to firefighters and the community. In addition to the potential for human and wildlife impacts that occur during fire-fighting activities, on some areas of the Installation, UXO also pose a threat of uncontrolled and unanticipated explosions especially of concern during fire-fighting activities.

Fort Sill already actively mitigates fire risks by maintaining existing firebreaks (corridors denuded of vegetation) and fuel load management techniques that involve the control of agricultural activities on leases and removal of grassy and woody vegetation along fences and within military quarters during grounds maintenance. In addition, the Installation conducts prescribed burns to control vegetation and encourage healthy re-growth, cuts down fire wood/timber on their timber leases, and clears mesquite trees and brush that exhibits a high, dense fuel load. Existing conditions, including strong winds and areas with high fire fuel loads, result in the potential for extremely high risk to human health and the environment during fires and potential for wild fires to occur. The presence of UXO and the potential occurrence of fast-moving fires at the Installation also cause traditional firefighting methods to be dangerous to humans and wildlife. The conditions and results caused by recent wild fires in the Fort Sill area, especially the 2011 Medicine Park fires, indicate that additional fire mitigation is necessary at the Installation.

The Fire Mitigation EA will evaluate the effects of the proposed additional fire mitigation activities to be performed within the East and West Training Ranges at the Installation. The planned additional fire mitigation activities include construction/maintenance of three, 40-foot wide, interior firebreaks within both of the East and West Training Ranges which total six miles of new firebreaks; mechanical removal of woody and grassy vegetation for 15 to 800 feet along each side of specific roadways that total 34 miles and 430 acres; and, the implementation of approved aerial spraying measures using best management practices to remove vegetation and reduce the fuel load in areas that are constrained for mechanical clearing by existing UXO or are otherwise inaccessible. Figure 2 illustrates both the firebreaks and areas of woody vegetation removal.

The location of the East and West Training Range firebreaks were selected to avoid aquatic species and sensitive habitats, such as wetlands, streams, and protected habitat, while establishing connecting corridors with existing firebreaks to the extent possible. The location and extent of the six planned firebreaks was determined based on the results of the wildlife fire probability analysis with the goal of controlling fires and reducing their spread to minimize the conditions that result in wild fires. Areas planned for woody vegetation removal were evaluated with the goal to control and minimize fires and conditions that cause wild fires while avoiding and minimizing impacts to sensitive habitats and the environment.

In compliance with Federal laws and regulation, impacts to aquatic habitat and sensitive species habitat will be avoided and then minimized to the extent possible. The area planned for woody vegetation removal consists of approximately 430 acres of land and, prior to construction, ecological surveys will be conducted to identify the location of potential Federally-listed animal and plant species and their habitat. As an example, Black-capped Vireo (*Vireo atricapilla*) habitat will be avoided during construction of the proposed firebreak corridors.

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Sincerely,



Sarah Sminkey  
National Environmental Policy Act Coordinator  
Environmental Quality Division, Support Branch

Enclosures

Cc:

Lara Zuzak, AICP, PMP, Project Manager, URS Group, Inc.



**DEPARTMENT OF THE ARMY**  
**US ARMY INSTALLATION MANAGEMENT COMMAND**  
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL**  
**2515 Ringgold ROAD**  
**FORT SILL, OKLAHOMA 73503**

August 25, 2015  
(Via mail)

**SUBJECT: Comanche County Commissioners Coordination Letter**  
**Fire Mitigation Environmental Assessment**  
**U.S. Army Garrison Fort Sill, Oklahoma (Comanche County)**

The Honorable Comanche County Commissioners  
Comanche County Courthouse  
315 SW 5th Street  
Suite 303  
Lawton, OK 73501

Dear Comanche County Commissioners:

The U.S. Army Garrison Fort Sill, Oklahoma (Installation or Ft. Sill) is located in Comanche County in southwestern Oklahoma about 50 miles north of Wichita Falls and 90 southwest of Oklahoma City (Figure 1). The Installation adjoins Cache and Lawton and the town of Indianola on the south and Elgin and the town of Medicine Park on the north. The Wichita Mountains National Wildlife Refuge (NWR) is located adjacent to the Installation's northwestern property boundary.

Fort Sill is preparing an Environmental Assessment (EA) to evaluate the effects of additional, proposed fire mitigation measures to be implemented at the East and West Training Ranges of the Installation. The Installation extends 27 miles in an east-west direction, four to nine miles in a north-south direction, and consists of 93,641 acres of land. The Installation includes military quarters, support areas, and almost 86,000 acres of range land devoted to U.S. military training activities conducted in accordance with Department of Defense (DoD) readiness requirements. Of the 86,000 acres of available range land, more than 48,000 acres is used for training and the remaining 38,000 acres are called impact areas, used for ordnance training and ordnance demolition activities. Approximately 73,000 acres of the existing Training Ranges are used year round for live-fire training and military exercises; live ordnance is fired at the target or impact area which may also include demolition training activities. Unexploded ordnance (UXO) is present on both training ranges at unmaped locations.

This letter requests agency and public stakeholder comment on the proposed fire mitigation activities contemplated by the Installation to provide increased fire protection for the Installation and nearby communities by helping prevent the spread of wild fires and minimizing public health risks posed to firefighters and the community. In addition to the potential for human and wildlife impacts that occur during fire-fighting activities, on some areas of the Installation, UXO also pose a threat of uncontrolled and unanticipated explosions especially of concern during fire-fighting activities.

Fort Sill already actively mitigates fire risks by maintaining existing firebreaks (corridors denuded of vegetation) and fuel load management techniques that involve the control of agricultural activities on leases and removal of grassy and woody vegetation along fences and within military quarters during grounds maintenance. In addition, the Installation conducts prescribed burns to control vegetation and encourage healthy re-growth, cuts down fire wood/timber on their timber leases, and clears mesquite trees and brush that exhibits a high, dense fuel load. Existing conditions, including strong winds and areas with high fire fuel loads, result in the potential for extremely high risk to human health and the environment during fires and potential for wild fires to occur. The presence of UXO and the potential occurrence of fast-moving fires at the Installation also cause traditional firefighting methods to be dangerous to humans and wildlife. The conditions and results caused by recent wild fires in the Fort Sill area, especially the 2011 Medicine Park fires, indicate that additional fire mitigation is necessary at the Installation.

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Sincerely,



Sarah Sminkey  
National Environmental Policy Act Coordinator  
Environmental Quality Division, Support Branch

Enclosures

Cc:

Lara Zuzak, AICP, PMP, Project Manager, URS Group, Inc.



**DEPARTMENT OF THE ARMY**  
**US ARMY INSTALLATION MANAGEMENT COMMAND**  
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL**  
**2515 Ringgold ROAD**  
**FORT SILL, OKLAHOMA 73503**

August 25, 2015  
(Via mail)

SUBJECT: City of Elgin - City Hall Coordination Letter  
Fire Mitigation Environmental Assessment  
U.S. Army Garrison Fort Sill, Oklahoma (Comanche County)

The Honorable Larry Thoma  
Mayor of Elgin  
City of Elgin - City Hall  
8183 Oklahoma 17  
Elgin, OK 73538

Dear Mayor Thoma:

The U.S. Army Garrison Fort Sill, Oklahoma (Installation or Ft. Sill) is located in Comanche County in southwestern Oklahoma about 50 miles north of Wichita Falls and 90 southwest of Oklahoma City (Figure 1). The Installation adjoins Cache and Lawton and the town of Indianola on the south and Elgin and the town of Medicine Park on the north. The Wichita Mountains National Wildlife Refuge (NWR) is located adjacent to the Installation's northwestern property boundary.

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Sincerely,



Sarah Sminkey  
National Environmental Policy Act Coordinator  
Environmental Quality Division, Support Branch

Enclosures

Cc:

Lara Zuzak, AICP, PMP, Project Manager, URS Group, Inc.



**DEPARTMENT OF THE ARMY**  
**US ARMY INSTALLATION MANAGEMENT COMMAND**  
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL**  
**2515 Ringgold ROAD**  
**FORT SILL, OKLAHOMA 73503**

August 25, 2015  
(Via mail)

**SUBJECT: Emergency Management Director Coordination Letter**  
**Fire Mitigation Environmental Assessment**  
**U.S. Army Garrison Fort Sill, Oklahoma (Comanche County)**

Mr. Michael Merritt  
Emergency Management Director  
315 S.W. 5th Street  
Suite 107  
Lawton, OK 73501

Dear Mr. Merritt:

The U.S. Army Garrison Fort Sill, Oklahoma (Installation or Ft. Sill) is located in Comanche County in southwestern Oklahoma about 50 miles north of Wichita Falls and 90 southwest of Oklahoma City (Figure 1). The Installation adjoins Cache and Lawton and the town of Indianola on the south and Elgin and the town of Medicine Park on the north. The Wichita Mountains National Wildlife Refuge (NWR) is located adjacent to the Installation's northwestern property boundary.

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Sincerely,



Sarah Sminkey  
National Environmental Policy Act Coordinator  
Environmental Quality Division, Support Branch

Enclosures

Cc:  
Lara Zuzak, AICP, PMP, Project Manager, URS Group, Inc.



**DEPARTMENT OF THE ARMY**  
**US ARMY INSTALLATION MANAGEMENT COMMAND**  
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL**  
**2515 Ringgold ROAD**  
**FORT SILL, OKLAHOMA 73503**

August 25, 2015  
(Via mail)

SUBJECT: U. S. Environmental Protection Agency Coordination Letter  
Fire Mitigation Environmental Assessment  
U.S. Army Garrison Fort Sill, Oklahoma (Comanche County)

Mr. Ron Curry  
Federal Region VI Administrator  
U. S. Environmental Protection Agency  
1445 Ross Ave.  
Suite 1200  
Dallas, TX 75202

Dear Mr. Curry:

The U.S. Army Garrison Fort Sill, Oklahoma (Installation or Ft. Sill) is located in Comanche County in southwestern Oklahoma about 50 miles north of Wichita Falls and 90 southwest of Oklahoma City (Figure 1). The Installation adjoins Cache and Lawton and the town of Indianola on the south and Elgin and the town of Medicine Park on the north. The Wichita Mountains National Wildlife Refuge (NWR) is located adjacent to the Installation's northwestern property boundary.

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Sincerely,



Sarah Sminkey  
National Environmental Policy Act Coordinator  
Environmental Quality Division, Support Branch

Enclosures

Cc:  
Lara Zuzak, AICP, PMP, Project Manager, URS Group, Inc.



**DEPARTMENT OF THE ARMY**  
**US ARMY INSTALLATION MANAGEMENT COMMAND**  
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL**  
**2515 Ringgold ROAD**  
**FORT SILL, OKLAHOMA 73503**

August 25, 2015  
(Via mail)

SUBJECT: City of Lawton Coordination Letter  
Fire Mitigation Environmental Assessment  
U.S. Army Garrison Fort Sill, Oklahoma (Comanche County)

Mr. Jerry Ihler  
City Manager  
City of Lawton  
212 NW 9th St.  
Lawton, OK 73501

Dear Mr. Ihler:

The U.S. Army Garrison Fort Sill, Oklahoma (Installation or Ft. Sill) is located in Comanche County in southwestern Oklahoma about 50 miles north of Wichita Falls and 90 southwest of Oklahoma City (Figure 1). The Installation adjoins Cache and Lawton and the town of Indianola on the south and Elgin and the town of Medicine Park on the north. The Wichita Mountains National Wildlife Refuge (NWR) is located adjacent to the Installation's northwestern property boundary.

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The Fire Mitigation EA will evaluate the effects of the proposed additional fire mitigation activities to be performed within the East and West Training Ranges at the Installation. The planned additional fire mitigation activities include construction/maintenance of three, 40-foot wide, interior firebreaks within both of the East and West Training Ranges which total six miles of new firebreaks; mechanical removal of woody and grassy vegetation for 15 to 800 feet along each side of specific roadways that total 34 miles and 430 acres; and, the implementation of approved aerial spraying measures using best management practices to remove vegetation and reduce the fuel load in areas that are constrained for mechanical clearing by existing UXO or are otherwise inaccessible. Figure 2 illustrates both the firebreaks and areas of woody vegetation removal.

The location of the East and West Training Range firebreaks were selected to avoid aquatic species and sensitive habitats, such as wetlands, streams, and protected habitat, while establishing connecting corridors with existing firebreaks to the extent possible. The location and extent of the six planned firebreaks was determined based on the results of the wildlife fire probability analysis with the goal of controlling fires and reducing their spread to minimize the conditions that result in wild fires. Areas planned for woody vegetation removal were evaluated with the goal to control and minimize fires and conditions that cause wild fires while avoiding and minimizing impacts to sensitive habitats and the environment.

In compliance with Federal laws and regulation, impacts to aquatic habitat and sensitive species habitat will be avoided and then minimized to the extent possible. The area planned for woody vegetation removal consists of approximately 430 acres of land and, prior to construction, ecological surveys will be conducted to identify the location of potential Federally-listed animal and plant species and their habitat. As an example, Black-capped Vireo (*Vireo atricapilla*) habitat will be avoided during construction of the proposed firebreak corridors.

In areas where streams intersect planned firebreaks or woody removal areas, the pre-construction contours along the stream will be restored to pre-existing conditions so that impacts to waters of the United States, including wetlands, will be minimized. Riparian habitat removal will be conducted to minimize adverse effects on stream water quality and to avoid bank erosion and downstream sedimentation.

We are requesting that your office provide information concerning environmental and land use constraints, upcoming City projects near the proposed fire hazard mitigation, or other issues of interest that can be addressed by the Draft EA. The Draft EA will be publically noticed and should be available for a thirty-day public comment period later in 2015. We encourage you to monitor public notices for more information and provide comments when the Draft EA is released. Thank you for input on this important project. If you have any questions or need additional information to respond, please contact me at (580) 442-2849 or sarah.e.sminkey.civ@mail.mil. Your earliest reply will be appreciated.

Sincerely,



Sarah Sminkey  
National Environmental Policy Act Coordinator  
Environmental Quality Division, Support Branch

Enclosures

Cc:

Lara Zuzak, AICP, PMP, Project Manager, URS Group, Inc.



**DEPARTMENT OF THE ARMY**  
**US ARMY INSTALLATION MANAGEMENT COMMAND**  
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL**  
**2515 Ringgold ROAD**  
**FORT SILL, OKLAHOMA 73503**

August 25, 2015  
(Via mail)

**SUBJECT: City of Lawton - City Hall Coordination Letter**  
**Fire Mitigation Environmental Assessment**  
**U.S. Army Garrison Fort Sill, Oklahoma (Comanche County)**

The Honorable Fred Fitch  
Mayor of Lawton  
City of Lawton - City Hall  
212 N.W. 9th Street  
Lawton, OK 73501

Dear Mayor Fitch:

The U.S. Army Garrison Fort Sill, Oklahoma (Installation or Ft. Sill) is located in Comanche County in southwestern Oklahoma about 50 miles north of Wichita Falls and 90 southwest of Oklahoma City (Figure 1). The Installation adjoins Cache and Lawton and the town of Indianola on the south and Elgin and the town of Medicine Park on the north. The Wichita Mountains National Wildlife Refuge (NWR) is located adjacent to the Installation's northwestern property boundary.

Fort Sill is preparing an Environmental Assessment (EA) to evaluate the effects of additional, proposed fire mitigation measures to be implemented at the East and West Training Ranges of the Installation. The Installation extends 27 miles in an east-west direction, four to nine miles in a north-south direction, and consists of 93,641 acres of land. The Installation includes military quarters, support areas, and almost 86,000 acres of range land devoted to U.S. military training activities conducted in accordance with Department of Defense (DoD) readiness requirements. Of the 86,000 acres of available range land, more than 48,000 acres is used for training and the remaining 38,000 acres are called impact areas, used for ordnance training and ordnance demolition activities. Approximately 73,000 acres of the existing Training Ranges are used year round for live-fire training and military exercises; live ordnance is fired at the target or impact area which may also include demolition training activities. Unexploded ordnance (UXO) is present on both training ranges at unmapped locations.

This letter requests agency and public stakeholder comment on the proposed fire mitigation activities contemplated by the Installation to provide increased fire protection for the Installation and nearby communities by helping prevent the spread of wild fires and minimizing public health risks posed to firefighters and the community. In addition to the potential for human and wildlife impacts that occur during fire-fighting activities, on some areas of the Installation, UXO also pose a threat of uncontrolled and unanticipated explosions especially of concern during fire-fighting activities.

Fort Sill already actively mitigates fire risks by maintaining existing firebreaks (corridors denuded of vegetation) and fuel load management techniques that involve the control of agricultural activities on leases and removal of grassy and woody vegetation along fences and within military quarters during grounds maintenance. In addition, the Installation conducts prescribed burns to control vegetation and encourage healthy re-growth, cuts down fire wood/timber on their timber leases, and clears mesquite trees and brush that exhibits a high, dense fuel load. Existing conditions, including strong winds and areas with high fire fuel loads, result in the potential for extremely high risk to human health and the environment during fires and potential for wild fires to occur. The presence of UXO and the potential occurrence of fast-moving fires at the Installation also cause traditional firefighting methods to be dangerous to humans and wildlife. The conditions and results caused by recent wild fires in the Fort Sill area, especially the 2011 Medicine Park fires, indicate that additional fire mitigation is necessary at the Installation.

The Fire Mitigation EA will evaluate the effects of the proposed additional fire mitigation activities to be performed within the East and West Training Ranges at the Installation. The planned additional fire mitigation activities include construction/maintenance of three, 40-foot wide, interior firebreaks within both of the East and West Training Ranges which total six miles of new firebreaks; mechanical removal of woody and grassy vegetation for 15 to 800 feet along each side of specific roadways that total 34 miles and 430 acres; and, the implementation of approved aerial spraying measures using best management practices to remove vegetation and reduce the fuel load in areas that are constrained for mechanical clearing by existing UXO or are otherwise inaccessible. Figure 2 illustrates both the firebreaks and areas of woody vegetation removal.

The location of the East and West Training Range firebreaks were selected to avoid aquatic species and sensitive habitats, such as wetlands, streams, and protected habitat, while establishing connecting corridors with existing firebreaks to the extent possible. The location and extent of the six planned firebreaks was determined based on the results of the wildlife fire probability analysis with the goal of controlling fires and reducing their spread to minimize the conditions that result in wild fires. Areas planned for woody vegetation removal were evaluated with the goal to control and minimize fires and conditions that cause wild fires while avoiding and minimizing impacts to sensitive habitats and the environment.

In compliance with Federal laws and regulation, impacts to aquatic habitat and sensitive species habitat will be avoided and then minimized to the extent possible. The area planned for woody vegetation removal consists of approximately 430 acres of land and, prior to construction, ecological surveys will be conducted to identify the location of potential Federally-listed animal and plant species and their habitat. As an example, Black-capped Vireo (*Vireo atricapilla*) habitat will be avoided during construction of the proposed firebreak corridors.

In areas where streams intersect planned firebreaks or woody removal areas, the pre-construction contours along the stream will be restored to pre-existing conditions so that impacts to waters of the United States, including wetlands, will be minimized. Riparian habitat removal will be conducted to minimize adverse effects on stream water quality and to avoid bank erosion and downstream sedimentation.

We are requesting that your office provide information concerning environmental and land use constraints, upcoming City projects near the proposed fire hazard mitigation, or other issues of interest that can be addressed by the Draft EA. The Draft EA will be publically noticed and should be available for a thirty-day public comment period later in 2015. We encourage you to monitor public notices for more information and provide comments when the Draft EA is released. Thank you for input on this important project. If you have any questions or need additional information to respond, please contact me at (580) 442-2849 or sarah.e.sminkey.civ@mail.mil. Your earliest reply will be appreciated.

Sincerely,



Sarah Sminkey  
National Environmental Policy Act Coordinator  
Environmental Quality Division, Support Branch

Enclosures

Cc:  
Lara Zuzak, AICP, PMP, Project Manager, URS Group, Inc.



# City of Lawton

## Public Works Department

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Administration Office  
Office: (580) 581-3410  
Fax: (580) 581-3421

Mailing Address - 103 Southwest 4th Street  
Shipping Address - 2202 Southwest 3rd St  
Lawton, Oklahoma 73501

September 22, 2015

Ms. Sarah Sminkey, National Environmental Policy Act Coordinator

The Department of Army  
US Army Installation Management Command  
Headquarters United State Army Garrison, Ft Sill  
215 Ringgold Rd  
Ft Sill, OK 73503

RE: Fire Mitigation Environmental Assessment  
U.S. Army Garrison Ft Sill, Oklahoma

Ms. Sminkey;

Please find enclosed the copies of legal descriptions for the easements associated with the location of the City of Lawton water mains. Any of the fire mitigation installations may not conflict or hinder the access to these mains by the City of Lawton staff.

Sincerely,

A handwritten signature in black ink, appearing to read "Afsaneh Jabbar", is written over a large, horizontal, oval-shaped scribble.

Afsaneh Jabbar, P.E., Director W/WW  
City of Lawton

#### **MISSION STATEMENT**

To provide efficient, effective and responsive customer oriented service delivery.  
To promote a quality of life based on harmony and cooperation.  
To provide leadership and opportunity for Southwest Oklahoma

Lawton 6 Water Line Cross Connect (Between L30 – L24 on South Boundary Road)  
Fort Sill Transmission Lines  
Project Number - January 2015

Exhibit "B"

DEPARTMENT OF THE ARMY  
EASEMENT FOR RIGHT OF WAY  
(PIPE LINE)  
ON FORT SILL MILITARY RESERVATION

An Easement Ten (10) Feet either side of a line described below, over, across, in and upon land under the control of the Secretary of the Army at the location shown on Exhibit "A".

COMMENCING at the NW Corner of the NE 1/4 of said Section 23, Township Two North (T-2-N), Range Twelve West (R-12-W) I.M. Comanche County, Oklahoma; THENCE S 89°00'01" E a distance of 569.28 Feet along the North Section Line to a Point; THENCE N 00°59'59" E a distance of 174.64 Feet to the POINT OF BEGINNING.

THENCE N 45°33'10" E a distance of 36.06 Feet to the POINT OF ENDING.

Containing 781.38 Square Feet or 0.02 Acres More or Less.

Basis of Bearing: The bearings shown are derived from the North American Datum of 1993 (HARN) and are grid bearings.

This property legal description was prepared by the "City of Lawton" from parol evidence, historical aerial photos, existing deeds and section work. Field work done in the field locating valves, leaks and repairs as evidence of the lines location, there was no other field work done.



Exhibit "B"

DEPARTMENT OF THE ARMY  
EASEMENT FOR RIGHT OF WAY  
(PIPE LINE)  
ON FORT SILL MILITARY RESERVATION

An Easement Ten (10) Feet either side of a line described below, over, across, in and upon land under the control of the Secretary of the Army at the location shown on Exhibit "A".

COMMENCING at the NE Corner of the NE 1/4 of said Section 23, Township Two North (T-2-N), Range Twelve West (R-12-W) I.M. Comanche County, Oklahoma; THENCE N 89°00'01" W a distance of 1826.81 Feet along the North Section Line to a Point; THENCE N 44°00'22" W a distance of 226.59 Feet to a POINT on the South Boundary of Fort Sill Military Reservation the POINT OF BEGINNING.

THENCE N 44°00'22" W a distance of 58.32 Feet to a POINT;  
THENCE N 37°57'31" W a distance of 14.66 Feet to a POINT;  
THENCE N 37°57'20" W a distance of 2573.71 Feet to a POINT;  
THENCE N 22°09'00" W a distance of 1656.94 Feet to a POINT;  
THENCE N 21°02'19" W a distance of 1817.54 Feet to a POINT;  
THENCE N 29°07'12" W a distance of 36.26 Feet to a POINT;  
THENCE N 19°48'56" W a distance of 139.19 Feet to a POINT;  
THENCE N 40°28'15" W a distance of 11.19 Feet to a POINT;  
THENCE N 21°16'10" W a distance of 625.71 Feet to a POINT;  
THENCE N 22°44'32" W a distance of 2009.51 Feet to a POINT;  
THENCE N 22°03'09" W a distance of 943.12 Feet to a POINT;  
THENCE N 21°59'37" W a distance of 1399.25 Feet to a POINT;  
THENCE N 22°24'07" W a distance of 893.38 Feet to a POINT;  
THENCE N 21°28'18" W a distance of 1877.79 Feet to a POINT;  
THENCE N 21°18'45" W a distance of 1142.73 Feet to a POINT;  
THENCE N 20°26'24" W a distance of 793.52 Feet to a POINT;  
THENCE N 21°16'58" W a distance of 806.35 Feet to a POINT;  
THENCE N 20°55'11" W a distance of 1304.44 Feet to a POINT;  
THENCE N 19°35'34" W a distance of 322.10 Feet to a POINT;  
THENCE N 20°15'01" W a distance of 1647.40 Feet to a POINT;  
THENCE N 20°24'35" W a distance of 180.90 Feet to a POINT;  
THENCE N 14°53'39" W a distance of 757.80 Feet to a POINT;  
THENCE N 01°47'18" W a distance of 19.84 Feet to a POINT;  
THENCE N 04°48'13" E a distance of 338.13 Feet to a POINT;  
THENCE N 06°42'15" E a distance of 263.04 Feet to a POINT;  
THENCE N 01°58'39" E a distance of 311.37 Feet to a POINT;  
THENCE N 00°53'47" W a distance of 459.55 Feet to a POINT;  
THENCE N 09°54'54" W a distance of 556.56 Feet to a POINT;  
THENCE N 09°00'21" W a distance of 770.57 Feet to a POINT;  
THENCE N 10°56'38" W a distance of 146.20 Feet to a POINT;  
THENCE N 20°17'26" W a distance of 281.66 Feet to a POINT;  
THENCE N 29°58'20" W a distance of 465.61 Feet to a POINT;  
THENCE N 29°16'34" W a distance of 894.84 Feet to a POINT;  
THENCE N 53°18'10" W a distance of 1106.59 Feet to a POINT;  
THENCE N 51°54'34" W a distance of 909.85 Feet to a POINT;  
THENCE N 55°04'57" W a distance of 2276.70 Feet to a POINT;  
THENCE N 49°34'25" W a distance of 1977.36 Feet to a POINT;

Lawton 24 Waterline (Transmission)  
Fort Sill Transmission Lines  
Project Number - January 2015

THENCE N 76°26'17" W a distance of 392.62 Feet to a POINT;  
THENCE N 71°25'22" W a distance of 719.63 Feet to a POINT;  
THENCE N 70°06'38" W a distance of 878.28 Feet to a POINT;  
THENCE N 63°04'27" W a distance of 260.33 Feet to a POINT;  
THENCE N 59°35'48" W a distance of 1503.79 Feet to a POINT on the NORTH Boundary  
of Fort Sill Military Reservation the POINT OF ENDING.

Containing 710,886.01 Square Feet or 16.32 Acres More or Less.

Basis of Bearing: The bearings shown are derived from the North American Datum of 1993 (HARN) and are grid bearings.

This property legal description was prepared by the "City of Lawton" from parol evidence, historical aerial photos, existing deeds and section work. Field work done in the field locating valves, leaks and repairs as evidence of the lines location, there was no other field work done.



Lawton 24 Waterline (North High Zone Water Tower)  
Fort Sill Transmission Lines  
Project Number – January 2015

Exhibit "B"

DEPARTMENT OF THE ARMY  
EASEMENT FOR RIGHT OF WAY  
(PIPE LINE)  
ON FORT SILL MILITARY RESERVATION

An Easement Ten (10) Feet either side of a line described below, over, across, in and upon land under the control of the Secretary of the Army at the location shown on Exhibit "A".

COMMENCING at the NW Corner of the NW 1/4 of said Section 23, Township Two North (T-2-N), Range Twelve West (R-12-W) I.M. Comanche County, Oklahoma; THENCE S 89°00'07" E a distance of 1116.12 Feet along the North Section Line to a Point; THENCE N 00°05'40" W a distance of 60.13 Feet to a POINT on the South Boundary of Fort Sill Military Reservation the POINT OF BEGINNING.

THENCE N 00°05'40" E a distance of 74.60 Feet to the POINT OF ENDING.

Containing 1496.24 Square Feet or 0.03 Acres More or Less.

Basis of Bearing: The bearings shown are derived from the North American Datum of 1993 (HARN) and are grid bearings.

This property legal description was prepared by the "City of Lawton" from parol evidence, historical aerial photos, existing deeds and section work. Field work done in the field locating valves, leaks and repairs as evidence of the lines location, there was no other field work done.



Lawton 36 Water Line Cross Connect  
Fort Sill Transmission Lines  
Project Number - January 2015

Exhibit "B"

DEPARTMENT OF THE ARMY  
EASEMENT FOR RIGHT OF WAY  
(PIPE LINE)  
ON FORT SILL MILITARY RESERVATION

An Easement Ten (10) Feet either side of a line described below, over, across, in and upon land under the control of the Secretary of the Army at the location shown on Exhibit "A".

COMMENCING at the NW Corner of the NW 1/4 of said Section 23, Township Two North (T-2-N), Range Twelve West (R-12-W) I.M. Comanche County, Oklahoma; THENCE S 89°00'07" E a distance of 607.42 Feet along the North Section Line to a Point; THENCE N 00°59'53" E a distance of 190.29 Feet to the POINT OF BEGINNING.

THENCE S 83°51'11" E a distance of 508.00 Feet to a POINT;

THENCE S 89°17'48" E a distance of 897.19 Feet to a POINT;

THENCE S 89°47'49" E a distance of 1172.02 Feet to the POINT OF ENDING.

Containing 51,544.25 Square Feet or 1.18 Acres More or Less.

Basis of Bearing: The bearings shown are derived from the North American Datum of 1993 (HARN) and are grid bearings.

This property legal description was prepared by the "City of Lawton" from parol evidence, historical aerial photos, existing deeds and section work. Field work done in the field locating valves, leaks and repairs as evidence of the lines location, there was no other field work done.

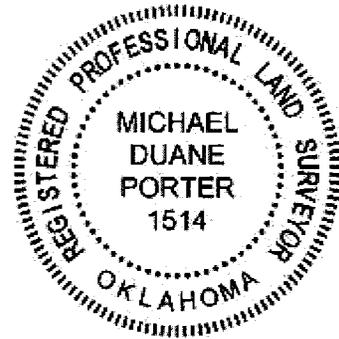


Exhibit "B"

DEPARTMENT OF THE ARMY  
EASEMENT FOR RIGHT OF WAY  
(PIPE LINE)  
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An Easement Ten (10) Feet either side of a line described below, over, across, in and upon land under the control of the Secretary of the Army at the location shown on Exhibit "A".

COMMENCING at the NE Corner of the NE 1/4 of said Section 23, Township Two North (T-2-N), Range Twelve West (R-12-W) I.M. Comanche County, Oklahoma; THENCE N 89°00'01" W a distance of 1941.00 Feet along the North Section Line to a Point; THENCE N 37°58'05" W a distance of 206.05 Feet to a POINT on the South Boundary of Fort Sill Military Reservation the POINT OF BEGINNING.

THENCE N 37°58'05" W a distance of 19.71 Feet to a POINT;  
THENCE N 39°14'46" W a distance of 239.56 Feet to a POINT;  
THENCE N 36°47'58" W a distance of 189.68 Feet to a POINT;  
THENCE N 37°50'05" W a distance of 279.32 Feet to a POINT;  
THENCE N 37°57'47" W a distance of 729.11 Feet to a POINT;  
THENCE N 37°20'11" W a distance of 338.42 Feet to a POINT;  
THENCE N 37°51'00" W a distance of 249.99 Feet to a POINT;  
THENCE N 36°56'20" W a distance of 176.23 Feet to a POINT;  
THENCE N 35°23'54" W a distance of 505.58 Feet to a POINT;  
THENCE N 17°43'07" W a distance of 142.26 Feet to a POINT;  
THENCE N 22°09'53" W a distance of 152.90 Feet to a POINT;  
THENCE N 23°39'47" W a distance of 215.10 Feet to a POINT;  
THENCE N 22°18'20" W a distance of 635.13 Feet to a POINT;  
THENCE N 22°17'36" W a distance of 311.28 Feet to a POINT;  
THENCE N 22°07'53" W a distance of 1321.54 Feet to a POINT;  
THENCE N 22°29'27" W a distance of 747.52 Feet to a POINT;  
THENCE N 26°16'40" W a distance of 10.18 Feet to a POINT;  
THENCE N 22°03'23" W a distance of 2311.85 Feet to a POINT;  
THENCE N 22°20'27" W a distance of 1772.83 Feet to a POINT;  
THENCE N 23°14'52" W a distance of 368.80 Feet to a POINT;  
THENCE N 22°51'00" W a distance of 492.28 Feet to a POINT;  
THENCE N 22°31'56" W a distance of 223.54 Feet to a POINT;  
THENCE N 21°12'56" W a distance of 363.53 Feet to a POINT;  
THENCE N 18°46'13" W a distance of 962.76 Feet to a POINT;  
THENCE N 20°04'05" W a distance of 1229.38 Feet to a POINT;  
THENCE N 22°24'14" W a distance of 693.68 Feet to a POINT;  
THENCE N 23°58'12" W a distance of 208.22 Feet to a POINT;  
THENCE N 22°55'15" W a distance of 122.63 Feet to a POINT;  
THENCE N 18°32'06" W a distance of 352.29 Feet to a POINT;  
THENCE N 22°40'42" W a distance of 505.99 Feet to a POINT;  
THENCE N 20°35'43" W a distance of 110.14 Feet to a POINT;  
THENCE N 19°41'38" W a distance of 765.62 Feet to a POINT;  
THENCE N 20°46'03" W a distance of 1847.77 Feet to a POINT;  
THENCE N 20°26'57" W a distance of 331.21 Feet to a POINT;  
THENCE N 23°22'07" W a distance of 180.90 Feet to a POINT;  
THENCE N 20°32'52" W a distance of 1042.05 Feet to a POINT;  
THENCE N 13°56'01" W a distance of 578.08 Feet to a POINT;

Lawton 30 Waterline (Transmission)  
Fort Sill Transmission Lines  
Project Number - January 2015

THENCE N 10°52'07" W a distance of 279.14 Feet to a POINT;  
THENCE N 08°28'41" E a distance of 18.53 Feet to a POINT;  
THENCE N 06°15'14" E a distance of 84.76 Feet to a POINT;  
THENCE N 04°16'41" E a distance of 356.16 Feet to a POINT;  
THENCE N 05°35'08" E a distance of 131.34 Feet to a POINT;  
THENCE N 01°44'28" E a distance of 208.39 Feet to a POINT;  
THENCE N 00°28'06" E a distance of 60.93 Feet to a POINT;  
THENCE N 00°55'36" E a distance of 475.81 Feet to a POINT;  
THENCE N 08°50'20" W a distance of 584.57 Feet to a POINT;  
THENCE N 09°46'16" W a distance of 921.24 Feet to a POINT;  
THENCE N 17°58'35" W a distance of 164.75 Feet to a POINT;  
THENCE N 20°15'56" W a distance of 112.27 Feet to a POINT;  
THENCE N 29°54'39" W a distance of 466.53 Feet to a POINT;  
THENCE N 29°11'18" W a distance of 750.42 Feet to a POINT;  
THENCE N 49°29'29" W a distance of 165.29 Feet to a POINT;  
THENCE N 49°32'34" W a distance of 562.58 Feet to a POINT;  
THENCE N 57°53'36" W a distance of 43.86 Feet to a POINT;  
THENCE N 49°52'04" W a distance of 155.83 Feet to a POINT;  
THENCE N 52°59'57" W a distance of 497.95 Feet to a POINT;  
THENCE N 52°27'31" W a distance of 692.69 Feet to a POINT;  
THENCE N 54°51'53" W a distance of 2287.97 Feet to a POINT;  
THENCE N 49°57'07" W a distance of 14.43 Feet to a POINT;  
THENCE N 49°34'25" W a distance of 1853.11 Feet to a POINT;  
THENCE N 70°29'08" W a distance of 449.51 Feet to a POINT;  
THENCE N 72°01'26" W a distance of 487.64 Feet to a POINT;  
THENCE N 72°03'14" W a distance of 43.48 Feet to a POINT;  
THENCE N 74°13'43" W a distance of 209.95 Feet to a POINT;  
THENCE N 68°26'32" W a distance of 153.66 Feet to a POINT;  
THENCE N 69°08'28" W a distance of 165.22 Feet to a POINT;  
THENCE N 69°33'36" W a distance of 470.93 Feet to a POINT;  
THENCE N 64°02'19" W a distance of 189.76 Feet to a POINT;  
THENCE N 61°21'07" W a distance of 185.29 Feet to a POINT;  
THENCE N 66°10'04" W a distance of 97.71 Feet to a POINT;  
THENCE N 59°13'38" W a distance of 1429.08 Feet to a POINT on the NORTH Boundary  
of Fort Sill Military Reservation the POINT OF ENDING.

Containing 709,957.39 Square Feet or 16.30 Acres More or Less.

Basis of Bearing: The bearings shown are derived from the North American Datum of 1993 (HARN) and are grid bearings.

This property legal description was prepared by the "City of Lawton" from parol evidence, historical aerial photos, existing deeds and section work. Field work done in the field locating valves, leaks and repairs as evidence of the lines location, there was no other field work done.



DEPARTMENT OF THE ARMY  
EASEMENT FOR RIGHT OF WAY  
(PIPE LINE)  
ON FORT SILL MILITARY RESERVATION

An Easement Ten (10) Feet either side of a line described below, over, across, in and upon land under the control of the Secretary of the Army at the location shown on Exhibit "A".

COMMENCING at the NW Corner of the NW 1/4 of said Section 23, Township Two North (T-2-N), Range Twelve West (R-12-W) I.M. Comanche County, Oklahoma; THENCE S 89°00'07" E a distance of 427.48 Feet along the North Section Line to a Point; THENCE N 50°31'42" E a distance of 123.40 Feet to a POINT on the South Boundary of Fort Sill Military Reservation the POINT OF BEGINNING.

THENCE N 50°31'42" E a distance of 118.83 to Feet to a POINT;  
THENCE N 06°28'57" W a distance of 28.22 Feet to a POINT;  
THENCE N 06°28'57" W a distance of 14.55 Feet to a POINT;  
THENCE N 03°51'07" W a distance of 839.24 Feet to a POINT;  
THENCE N 04°05'38" W a distance of 1793.37 Feet to a POINT;  
THENCE N 04°06'04" W a distance of 608.67 Feet to a POINT;  
THENCE N 04°03'41" W a distance of 655.61 Feet to a POINT;  
THENCE N 05°33'00" W a distance of 1491.77 Feet to a POINT;  
THENCE N 21°34'44" W a distance of 22.74 Feet to a POINT;  
THENCE N 23°55'49" W a distance of 351.84 Feet to a POINT;  
THENCE N 22°49'26" W a distance of 2360.65 Feet to a POINT;  
THENCE N 21°29'33" W a distance of 2766.50 Feet to a POINT;  
THENCE N 21°37'32" W a distance of 1006.35 Feet to a POINT;  
THENCE N 17°33'59" W a distance of 635.16 Feet to a POINT;  
THENCE N 18°43'23" W a distance of 267.11 Feet to a POINT;  
THENCE N 21°42'54" W a distance of 113.14 Feet to a POINT;  
THENCE N 23°47'50" W a distance of 768.06 Feet to a POINT;  
THENCE N 20°10'07" W a distance of 894.04 Feet to a POINT;  
THENCE N 21°26'42" W a distance of 1139.59 Feet to a POINT;  
THENCE N 19°55'28" W a distance of 1484.75 Feet to a POINT;  
THENCE N 20°24'09" W a distance of 356.51 Feet to a POINT;  
THENCE N 20°54'04" W a distance of 1683.14 Feet to a POINT;  
THENCE N 13°21'12" W a distance of 542.87 Feet to a POINT;  
THENCE N 10°29'41" W a distance of 294.68 Feet to a POINT;  
THENCE N 09°26'11" W a distance of 23.57 Feet to a POINT;  
THENCE N 03°36'39" W a distance of 142.84 Feet to a POINT;  
THENCE N 09°36'58" E a distance of 197.65 Feet to a POINT;  
THENCE N 02°43'00" E a distance of 41.49 Feet to a POINT;  
THENCE N 07°21'54" E a distance of 171.22 Feet to a POINT;  
THENCE N 03°24'35" W a distance of 86.20 Feet to a POINT;  
THENCE N 01°34'36" E a distance of 656.38 Feet to a POINT;  
THENCE N 09°04'18" W a distance of 369.56 Feet to a POINT;  
THENCE N 08°14'01" W a distance of 273.60 Feet to a POINT;  
THENCE N 04°50'01" W a distance of 162.35 Feet to a POINT;  
THENCE N 09°36'34" W a distance of 524.45 Feet to a POINT;  
THENCE N 12°38'41" W a distance of 336.31 Feet to a POINT;  
THENCE N 24°30'05" W a distance of 241.00 Feet to a POINT;

Lawton 42 Waterline (Transmission)  
Fort Sill Transmission Lines  
Project Number – January 2015

THENCE N 30°30'52" W a distance of 450.69 Feet to a POINT;  
THENCE N 29°21'28" W a distance of 301.76 Feet to a POINT;  
THENCE N 30°51'29" W a distance of 306.92 Feet to a POINT;  
THENCE N 42°51'06" W a distance of 274.53 Feet to a POINT;  
THENCE N 50°34'25" W a distance of 346.68 Feet to a POINT;  
THENCE N 52°28'55" W a distance of 1544.51 Feet to a POINT;  
THENCE N 54°21'49" W a distance of 2297.59 Feet to a POINT;  
THENCE N 47°47'32" W a distance of 457.13 Feet to a POINT;  
THENCE N 48°47'40" W a distance of 148.19 Feet to a POINT;  
THENCE N 50°15'01" W a distance of 1154.01 Feet to a POINT;  
THENCE N 50°36'43" W a distance of 81.79 Feet to a POINT;  
THENCE N 63°58'50" W a distance of 108.03 Feet to a POINT;  
THENCE N 70°51'06" W a distance of 188.41 Feet to a POINT;  
THENCE N 71°54'14" W a distance of 991.93 Feet to a POINT;  
THENCE N 69°20'47" W a distance of 460.97 Feet to a POINT;  
THENCE N 67°21'23" W a distance of 495.58 Feet to a POINT;  
THENCE N 64°07'53" W a distance of 538.01 Feet to a POINT;  
THENCE N 56°32'10" W a distance of 1149.08 Feet to a POINT on the NORTH  
Boundary of Fort Sill Military Reservation the POINT of ENDING.

Containing 695,195.43 Square Feet or 15.96 Acres More or Less.

Basis of Bearing: The bearings shown are derived from the North American Datum of 1993 (HARN) and are grid bearings.

This property legal description was prepared by the "City of Lawton" from parcel evidence, historical aerial photos, existing deeds and section work. Field work done in the field locating valves, leaks and repairs as evidence of the lines location, there was no other field work done.



Exhibit "B"

DEPARTMENT OF THE ARMY  
EASEMENT FOR RIGHT OF WAY  
(PIPE LINE)  
ON FORT SILL MILITARY RESERVATION

An Easement Ten (10) Feet either side of a line described below, over, across, in and upon land under the control of the Secretary of the Army at the location shown on Exhibit "A".

COMMENCING at the S Corner of the of Section 17, Township Three North (T-3-N), Range Twelve West (R-12-W) I.M. Comanche County, Oklahoma; THENCE N 88°59'54" W a distance of 1152.69 Feet along the South Section Line to a Point; THENCE S 01°00'06" W a distance of 2645.10 Feet to a POINT on the North Boundary of Fort Sill Military Reservation the POINT OF BEGINNING.

THENCE S 60°01'14" E a distance of 1548.65 Feet to a POINT;  
THENCE S 61°41'30" E a distance of 232.20 Feet to a POINT;  
THENCE S 75°02'14" E a distance of 691.91 Feet to a POINT;  
THENCE S 70°10'49" E a distance of 1280.10 Feet to a POINT;  
THENCE S 49°48'45" E a distance of 1969.24 Feet to a POINT;  
THENCE S 55°04'57" E a distance of 2276.70 Feet to a POINT;  
THENCE S 52°28'55" E a distance of 1544.51 Feet to a POINT;  
THENCE S 55°48'59" E a distance of 255.80 Feet to a POINT;  
THENCE S 55°12'13" E a distance of 182.13 Feet to a POINT;  
THENCE S 28°15'58" E a distance of 350.81 Feet to a POINT;  
THENCE S 29°00'29" E a distance of 606.81 Feet to a POINT;  
THENCE S 31°22'41" E a distance of 454.80 Feet to a POINT;  
THENCE S 21°48'58" E a distance of 205.27 Feet to a POINT;  
THENCE S 17°01'01" E a distance of 79.49 Feet to a POINT;  
THENCE S 08°52'04" E a distance of 917.00 Feet to a POINT;  
THENCE S 12°54'21" E a distance of 302.84 Feet to a POINT;  
THENCE S 08°15'32" E a distance of 262.73 Feet to a POINT;  
THENCE S 06°09'47" E a distance of 45.68 Feet to a POINT;  
THENCE S 01°41'57" W a distance of 28.59 Feet to a POINT;  
THENCE S 01°55'57" E a distance of 292.64 Feet to a POINT;  
THENCE S 04°09'08" W a distance of 391.78 Feet to a POINT;  
THENCE S 04°32'10" W a distance of 255.79 Feet to a POINT;  
THENCE S 01°07'38" E a distance of 329.79 Feet to a POINT;  
THENCE S 06°22'17" E a distance of 29.84 Feet to a POINT;  
THENCE S 10°08'16" E a distance of 620.07 Feet to a POINT;  
THENCE S 36°09'03" E a distance of 128.27 Feet to a POINT;  
THENCE S 60°41'48" E a distance of 160.11 Feet to a POINT;  
THENCE S 60°58'35" E a distance of 478.90 Feet to a POINT;  
THENCE S 60°14'22" E a distance of 445.96 Feet to a POINT;  
THENCE S 59°52'30" E a distance of 232.26 Feet to a POINT;  
THENCE S 59°46'49" E a distance of 1420.17 Feet to a POINT;  
THENCE S 56°40'03" E a distance of 67.34 Feet to a POINT;  
THENCE S 58°43'36" E a distance of 312.76 Feet to a POINT;  
THENCE S 59°34'04" E a distance of 493.89 Feet to a POINT;  
THENCE S 60°27'34" E a distance of 582.23 Feet to a POINT;  
THENCE S 58°39'52" E a distance of 574.38 Feet to a POINT;  
THENCE S 59°59'58" E a distance of 359.64 Feet to a POINT;

Fort Sill 24 Waterline (Transmission)  
Fort Sill Transmission Lines  
Project Number - January 2015

THENCE S 66°08'17" E a distance of 102.43 Feet to a POINT;  
THENCE S 58°43'55" E a distance of 675.26 Feet to a POINT;  
THENCE S 60°56'14" E a distance of 370.02 Feet to a POINT;  
THENCE S 65°29'51" E a distance of 693.11 Feet to a POINT;  
THENCE S 62°36'28" E a distance of 308.04 Feet to a POINT;  
THENCE S 67°50'28" E a distance of 125.67 Feet to a POINT;  
THENCE S 69°59'52" E a distance of 433.96 Feet to a POINT;  
THENCE S 74°45'27" E a distance of 1050.87 Feet to a POINT;  
THENCE S 74°45'05" E a distance of 272.52 Feet to a POINT;  
THENCE S 75°22'05" E a distance of 275.85 Feet to a POINT OF ENDING.

Containing 494,376.38 Square Feet or 11.35 Acres More or Less.

Basis of Bearing: The bearings shown are derived from the North American Datum of 1993 (HARN) and are grid bearings.

This property legal description was prepared by the "City of Lawton" from parol evidence, historical aerial photos, existing deeds and section work. Field work done in the field locating valves, leaks and repairs as evidence of the lines location, there was no other field work done.





**DEPARTMENT OF THE ARMY**  
**US ARMY INSTALLATION MANAGEMENT COMMAND**  
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL**  
**2515 Ringgold ROAD**  
**FORT SILL, OKLAHOMA 73503**

August 25, 2015  
(Via mail)

**SUBJECT: Town of Medicine Park Coordination Letter**  
**Fire Mitigation Environmental Assessment**  
**U.S. Army Garrison Fort Sill, Oklahoma (Comanche County)**

The Honorable Charles (Chaz) Callich  
Mayor of Medicine Park  
Town of Medicine Park  
P.O. Box 231  
Medicine Park, OK 73557

Dear Mayor Callich:

The U.S. Army Garrison Fort Sill, Oklahoma (Installation or Ft. Sill) is located in Comanche County in southwestern Oklahoma about 50 miles north of Wichita Falls and 90 southwest of Oklahoma City (Figure 1). The Installation adjoins Cache and Lawton and the town of Indianola on the south and Elgin and the town of Medicine Park on the north. The Wichita Mountains National Wildlife Refuge (NWR) is located adjacent to the Installation's northwestern property boundary.

Fort Sill is preparing an Environmental Assessment (EA) to evaluate the effects of additional, proposed fire mitigation measures to be implemented at the East and West Training Ranges of the Installation. The Installation extends 27 miles in an east-west direction, four to nine miles in a north-south direction, and consists of 93,641 acres of land. The Installation includes military quarters, support areas, and almost 86,000 acres of range land devoted to U.S. military training activities conducted in accordance with Department of Defense (DoD) readiness requirements. Of the 86,000 acres of available range land, more than 48,000 acres is used for training and the remaining 38,000 acres are called impact areas, used for ordnance training and ordnance demolition activities. Approximately 73,000 acres of the existing Training Ranges are used year round for live-fire training and military exercises; live ordnance is fired at the target or impact area which may also include demolition training activities. Unexploded ordnance (UXO) is present on both training ranges at unmapped locations.

This letter requests agency and public stakeholder comment on the proposed fire mitigation activities contemplated by the Installation to provide increased fire protection for the Installation and nearby communities by helping prevent the spread of wild fires and minimizing public health risks posed to firefighters and the community. In addition to the potential for human and wildlife impacts that occur during fire-fighting activities, on some areas of the Installation, UXO also pose a threat of uncontrolled and unanticipated explosions especially of concern during fire-fighting activities.

Fort Sill already actively mitigates fire risks by maintaining existing firebreaks (corridors denuded of vegetation) and fuel load management techniques that involve the control of agricultural activities on leases and removal of grassy and woody vegetation along fences and within military quarters during grounds maintenance. In addition, the Installation conducts prescribed burns to control vegetation and encourage healthy re-growth, cuts down fire wood/timber on their timber leases, and clears mesquite trees and brush that exhibits a high, dense fuel load. Existing conditions, including strong winds and areas with high fire fuel loads, result in the potential for extremely high risk to human health and the environment during fires and potential for wild fires to occur. The presence of UXO and the potential occurrence of fast-moving fires at the Installation also cause traditional firefighting methods to be dangerous to humans and wildlife. The conditions and results caused by recent wild fires in the Fort Sill area, especially the 2011 Medicine Park fires, indicate that additional fire mitigation is necessary at the Installation.

The Fire Mitigation EA will evaluate the effects of the proposed additional fire mitigation activities to be performed within the East and West Training Ranges at the Installation. The planned additional fire mitigation activities include construction/maintenance of three, 40-foot wide, interior firebreaks within both of the East and West Training Ranges which total six miles of new firebreaks; mechanical removal of woody and grassy vegetation for 15 to 800 feet along each side of specific roadways that total 34 miles and 430 acres; and, the implementation of approved aerial spraying measures using best management practices to remove vegetation and reduce the fuel load in areas that are constrained for mechanical clearing by existing UXO or are otherwise inaccessible. Figure 2 illustrates both the firebreaks and areas of woody vegetation removal.

The location of the East and West Training Range firebreaks were selected to avoid aquatic species and sensitive habitats, such as wetlands, streams, and protected habitat, while establishing connecting corridors with existing firebreaks to the extent possible. The location and extent of the six planned firebreaks was determined based on the results of the wildlife fire probability analysis with the goal of controlling fires and reducing their spread to minimize the conditions that result in wild fires. Areas planned for woody vegetation removal were evaluated with the goal to control and minimize fires and conditions that cause wild fires while avoiding and minimizing impacts to sensitive habitats and the environment.

In compliance with Federal laws and regulation, impacts to aquatic habitat and sensitive species habitat will be avoided and then minimized to the extent possible. The area planned for woody vegetation removal consists of approximately 430 acres of land and, prior to construction, ecological surveys will be conducted to identify the location of potential Federally-listed animal and plant species and their habitat. As an example, Black-capped Vireo (*Vireo atricapilla*) habitat will be avoided during construction of the proposed firebreak corridors.

In areas where streams intersect planned firebreaks or woody removal areas, the pre-construction contours along the stream will be restored to pre-existing conditions so that impacts to waters of the United States, including wetlands, will be minimized. Riparian habitat removal will be conducted to minimize adverse effects on stream water quality and to avoid bank erosion and downstream sedimentation.

We are requesting that your office provide information concerning environmental and land use constraints, upcoming Town projects near the proposed fire hazard mitigation, or other issues of interest that can be addressed by the Draft EA. The Draft EA will be publically noticed and should be available for a thirty-day public comment period later in 2015. We encourage you to monitor public notices for more information and provide comments when the Draft EA is released. Thank you for input on this important project. If you have any questions or need additional information to respond, please contact me at (580) 442-2849 or sarah.e.sminkey.civ@mail.mil. Your earliest reply will be appreciated.

Sincerely,



Sarah Sminkey  
National Environmental Policy Act Coordinator  
Environmental Quality Division, Support Branch

Enclosures

Cc:

Lara Zuzak, AICP, PMP, Project Manager, URS Group, Inc.



**DEPARTMENT OF THE ARMY**  
**US ARMY INSTALLATION MANAGEMENT COMMAND**  
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL**  
**2515 Ringgold ROAD**  
**FORT SILL, OKLAHOMA 73503**

August 25, 2015  
(Via mail)

SUBJECT: OK Department of Environmental Quality Coordination Letter  
Fire Mitigation Environmental Assessment  
U.S. Army Garrison Fort Sill, Oklahoma (Comanche County)

Mr. Scott Thompson  
Executive Director  
OK Department of Environmental Quality  
P.O. Box 1677  
Oklahoma City, OK 73101-1677

Dear Mr. Thompson:

The U.S. Army Garrison Fort Sill, Oklahoma (Installation or Ft. Sill) is located in Comanche County in southwestern Oklahoma about 50 miles north of Wichita Falls and 90 southwest of Oklahoma City (Figure 1). The Installation adjoins Cache and Lawton and the town of Indianola on the south and Elgin and the town of Medicine Park on the north. The Wichita Mountains National Wildlife Refuge (NWR) is located adjacent to the Installation's northwestern property boundary.

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This letter requests agency and public stakeholder comment on the proposed fire mitigation activities contemplated by the Installation to provide increased fire protection for the Installation and nearby communities by helping prevent the spread of wild fires and minimizing public health risks posed to firefighters and the community. In addition to the potential for human and wildlife impacts that occur during fire-fighting activities, on some areas of the Installation, UXO also pose a threat of uncontrolled and unanticipated explosions especially of concern during fire-fighting activities.

Fort Sill already actively mitigates fire risks by maintaining existing firebreaks (corridors denuded of vegetation) and fuel load management techniques that involve the control of agricultural activities on leases and removal of grassy and woody vegetation along fences and within military quarters during grounds maintenance. In addition, the Installation conducts prescribed burns to control vegetation and encourage healthy re-growth, cuts down fire wood/timber on their timber leases, and clears mesquite trees and brush that exhibits a high, dense fuel load. Existing conditions, including strong winds and areas with high fire fuel loads, result in the potential for extremely high risk to human health and the environment during fires and potential for wild fires to occur. The presence of UXO and the potential occurrence of fast-moving fires at the Installation also cause traditional firefighting methods to be dangerous to humans and wildlife. The conditions and results caused by recent wild fires in the Fort Sill area, especially the 2011 Medicine Park fires, indicate that additional fire mitigation is necessary at the Installation.

The Fire Mitigation EA will evaluate the effects of the proposed additional fire mitigation activities to be performed within the East and West Training Ranges at the Installation. The planned additional fire mitigation activities include construction/maintenance of three, 40-foot wide, interior firebreaks within both of the East and West Training Ranges which total six miles of new firebreaks; mechanical removal of woody and grassy vegetation for 15 to 800 feet along each side of specific roadways that total 34 miles and 430 acres; and, the implementation of approved aerial spraying measures using best management practices to remove vegetation and reduce the fuel load in areas that are constrained for mechanical clearing by existing UXO or are otherwise inaccessible. Figure 2 illustrates both the firebreaks and areas of woody vegetation removal.

The location of the East and West Training Range firebreaks were selected to avoid aquatic species and sensitive habitats, such as wetlands, streams, and protected habitat, while establishing connecting corridors with existing firebreaks to the extent possible. The location and extent of the six planned firebreaks was determined based on the results of the wildlife fire probability analysis with the goal of controlling fires and reducing their spread to minimize the conditions that result in wild fires. Areas planned for woody vegetation removal were evaluated with the goal to control and minimize fires and conditions that cause wild fires while avoiding and minimizing impacts to sensitive habitats and the environment.

In compliance with Federal laws and regulation, impacts to aquatic habitat and sensitive species habitat will be avoided and then minimized to the extent possible. The area planned for woody vegetation removal consists of approximately 430 acres of land and, prior to construction, ecological surveys will be conducted to identify the location of potential Federally-listed animal and plant species and their habitat. As an example, Black-capped Vireo (*Vireo atricapilla*) habitat will be avoided during construction of the proposed firebreak corridors.

In areas where streams intersect planned firebreaks or woody removal areas, the pre-construction contours along the stream will be restored to pre-existing conditions so that impacts to waters of the United States, including wetlands, will be minimized. Riparian habitat removal will be conducted to minimize adverse effects on stream water quality and to avoid bank erosion and downstream sedimentation.

We are requesting that your office provide information concerning environmental and land use constraints, upcoming projects near the proposed fire hazard mitigation, regulatory considerations, or other issues of interest that can be addressed by the Draft EA. The Draft EA will be publically noticed and should be available for a thirty-day public comment period later in 2015. We encourage you to monitor public notices for more information and provide comments when the Draft EA is released. Thank you for input on this important project. If you have any questions or need additional information to respond, please contact me at (580) 442-2849 or sarah.e.sminkey.civ@mail.mil. Your earliest reply will be appreciated.

Sincerely,



Sarah Sminkey  
National Environmental Policy Act Coordinator  
Environmental Quality Division, Support Branch

Enclosures

Cc:  
Lara Zuzak, AICP, PMP, Project Manager, URS Group, Inc.

From: Fields, Quiana [<mailto:quiana.fields@deq.ok.gov>]  
Sent: Tuesday, September 22, 2015 8:50 AM  
To: Sminkey, Sarah E CIV USARMY USAG (US) <[sarah.e.sminkey.civ@mail.mil](mailto:sarah.e.sminkey.civ@mail.mil)>  
Subject: Department of the Army

RE: Fire Mitigation Environmental Assessment - U.S. Army Garrison Fort Sill, Oklahoma (Comanche County)

Our agency have reviewed your project and have the following comment:

The Air Quality Division rules and planning section would like to inform you that there is an Open Burning Rule and if you have any questions about burning please contact Diana Henson at (405) 702-4171.

Thank you!

Quiana Fields, Administrative Programs Officer Office of the Executive Director Oklahoma Department of Environmental Quality  
Phone: (405) 702-7152  
Fax: (405) 702-7101  
[quiana.fields@deq.ok.gov](mailto:quiana.fields@deq.ok.gov)<<mailto:quiana.fields@deq.ok.gov>>



**DEPARTMENT OF THE ARMY**  
**US ARMY INSTALLATION MANAGEMENT COMMAND**  
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL**  
**2515 Ringgold ROAD**  
**FORT SILL, OKLAHOMA 73503**

August 25, 2015  
(Via mail)

**SUBJECT: Oklahoma House of Representatives Coordination Letter**  
**Fire Mitigation Environmental Assessment**  
**U.S. Army Garrison Fort Sill, Oklahoma (Comanche County)**

The Honorable Ann Coody  
Oklahoma House of Representatives  
2300 N. Lincoln Blvd.  
Room 439  
Oklahoma City, OK 73105

Dear Ms. Coody:

The U.S. Army Garrison Fort Sill, Oklahoma (Installation or Ft. Sill) is located in Comanche County in southwestern Oklahoma about 50 miles north of Wichita Falls and 90 southwest of Oklahoma City (Figure 1). The Installation adjoins Cache and Lawton and the town of Indianola on the south and Elgin and the town of Medicine Park on the north. The Wichita Mountains National Wildlife Refuge (NWR) is located adjacent to the Installation's northwestern property boundary.

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Sincerely,



Sarah Sminkey  
National Environmental Policy Act Coordinator  
Environmental Quality Division, Support Branch

Enclosures

Cc:

Lara Zuzak, AICP, PMP, Project Manager, URS Group, Inc.



**DEPARTMENT OF THE ARMY**  
**US ARMY INSTALLATION MANAGEMENT COMMAND**  
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL**  
**2515 Ringgold ROAD**  
**FORT SILL, OKLAHOMA 73503**

August 25, 2015  
(Via mail)

SUBJECT: Oklahoma House of Representatives Coordination Letter  
Fire Mitigation Environmental Assessment  
U.S. Army Garrison Fort Sill, Oklahoma (Comanche County)

The Honorable Jeff Coody  
Oklahoma House of Representatives  
2300 N. Lincoln Blvd.  
Room 338  
Oklahoma City, OK 73105

Dear Mr. Coody:

The U.S. Army Garrison Fort Sill, Oklahoma (Installation or Ft. Sill) is located in Comanche County in southwestern Oklahoma about 50 miles north of Wichita Falls and 90 southwest of Oklahoma City (Figure 1). The Installation adjoins Cache and Lawton and the town of Indianola on the south and Elgin and the town of Medicine Park on the north. The Wichita Mountains National Wildlife Refuge (NWR) is located adjacent to the Installation's northwestern property boundary.

Fort Sill is preparing an Environmental Assessment (EA) to evaluate the effects of additional, proposed fire mitigation measures to be implemented at the East and West Training Ranges of the Installation. The Installation extends 27 miles in an east-west direction, four to nine miles in a north-south direction, and consists of 93,641 acres of land. The Installation includes military quarters, support areas, and almost 86,000 acres of range land devoted to U.S. military training activities conducted in accordance with Department of Defense (DoD) readiness requirements. Of the 86,000 acres of available range land, more than 48,000 acres is used for training and the remaining 38,000 acres are called impact areas, used for ordnance training and ordnance demolition activities. Approximately 73,000 acres of the existing Training Ranges are used year round for live-fire training and military exercises; live ordnance is fired at the target or impact area which may also include demolition training activities. Unexploded ordnance (UXO) is present on both training ranges at unmapped locations.

This letter requests agency and public stakeholder comment on the proposed fire mitigation activities contemplated by the Installation to provide increased fire protection for the Installation and nearby communities by helping prevent the spread of wild fires and minimizing public health risks posed to firefighters and the community. In addition to the potential for human and wildlife impacts that occur during fire-fighting activities, on some areas of the Installation, UXO also pose a threat of uncontrolled and unanticipated explosions especially of concern during fire-fighting activities.

Fort Sill already actively mitigates fire risks by maintaining existing firebreaks (corridors denuded of vegetation) and fuel load management techniques that involve the control of agricultural activities on leases and removal of grassy and woody vegetation along fences and within military quarters during grounds maintenance. In addition, the Installation conducts prescribed burns to control vegetation and encourage healthy re-growth, cuts down fire wood/timber on their timber leases, and clears mesquite trees and brush that exhibits a high, dense fuel load. Existing conditions, including strong winds and areas with high fire fuel loads, result in the potential for extremely high risk to human health and the environment during fires and potential for wild fires to occur. The presence of UXO and the potential occurrence of fast-moving fires at the Installation also cause traditional firefighting methods to be dangerous to humans and wildlife. The conditions and results caused by recent wild fires in the Fort Sill area, especially the 2011 Medicine Park fires, indicate that additional fire mitigation is necessary at the Installation.

The Fire Mitigation EA will evaluate the effects of the proposed additional fire mitigation activities to be performed within the East and West Training Ranges at the Installation. The planned additional fire mitigation activities include construction/maintenance of three, 40-foot wide, interior firebreaks within both of the East and West Training Ranges which total six miles of new firebreaks; mechanical removal of woody and grassy vegetation for 15 to 800 feet along each side of specific roadways that total 34 miles and 430 acres; and, the implementation of approved aerial spraying measures using best management practices to remove vegetation and reduce the fuel load in areas that are constrained for mechanical clearing by existing UXO or are otherwise inaccessible. Figure 2 illustrates both the firebreaks and areas of woody vegetation removal.

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Sincerely,



Sarah Sminkey  
National Environmental Policy Act Coordinator  
Environmental Quality Division, Support Branch

Enclosures

Cc:

Lara Zuzak, AICP, PMP, Project Manager, URS Group, Inc.



**DEPARTMENT OF THE ARMY**  
**US ARMY INSTALLATION MANAGEMENT COMMAND**  
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL**  
**2515 Ringgold ROAD**  
**FORT SILL, OKLAHOMA 73503**

August 25, 2015  
(Via mail)

**SUBJECT: Oklahoma House of Representatives Coordination Letter**  
**Fire Mitigation Environmental Assessment**  
**U.S. Army Garrison Fort Sill, Oklahoma (Comanche County)**

The Honorable John Michael Montgomery  
Oklahoma House of Representatives  
2300 N. Lincoln Blvd.  
Room 329B  
Oklahoma City, OK 73105

Dear Mr. Montgomery:

The U.S. Army Garrison Fort Sill, Oklahoma (Installation or Ft. Sill) is located in Comanche County in southwestern Oklahoma about 50 miles north of Wichita Falls and 90 southwest of Oklahoma City (Figure 1). The Installation adjoins Cache and Lawton and the town of Indianola on the south and Elgin and the town of Medicine Park on the north. The Wichita Mountains National Wildlife Refuge (NWR) is located adjacent to the Installation's northwestern property boundary.

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Sincerely,



Sarah Sminkey  
National Environmental Policy Act Coordinator  
Environmental Quality Division, Support Branch

Enclosures

Cc:  
Lara Zuzak, AICP, PMP, Project Manager, URS Group, Inc.



**DEPARTMENT OF THE ARMY**  
**US ARMY INSTALLATION MANAGEMENT COMMAND**  
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL**  
**2515 Ringgold ROAD**  
**FORT SILL, OKLAHOMA 73503**

August 25, 2015  
(Via mail)

**SUBJECT: Oklahoma House of Representatives Coordination Letter**  
**Fire Mitigation Environmental Assessment**  
**U.S. Army Garrison Fort Sill, Oklahoma (Comanche County)**

The Honorable Scooter Park  
Oklahoma House of Representatives  
2300 N. Lincoln Blvd.  
Room 338  
Oklahoma City, OK 73105

Dear Mr. Park:

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Sincerely,



Sarah Sminkey  
National Environmental Policy Act Coordinator  
Environmental Quality Division, Support Branch

Enclosures

Cc:  
Lara Zuzak, AICP, PMP, Project Manager, URS Group, Inc.



**DEPARTMENT OF THE ARMY**  
**US ARMY INSTALLATION MANAGEMENT COMMAND**  
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL**  
**2515 Ringgold ROAD**  
**FORT SILL, OKLAHOMA 73503**

August 25, 2015  
(Via mail)

SUBJECT: Oklahoma Senate Coordination Letter  
Fire Mitigation Environmental Assessment  
U.S. Army Garrison Fort Sill, Oklahoma (Comanche County)

The Honorable Don Barrington  
Oklahoma Senate  
2300 N. Lincoln Blvd  
Room 515  
Oklahoma City, OK 73105

Dear Senator Barrington:

The U.S. Army Garrison Fort Sill, Oklahoma (Installation or Ft. Sill) is located in Comanche County in southwestern Oklahoma about 50 miles north of Wichita Falls and 90 southwest of Oklahoma City (Figure 1). The Installation adjoins Cache and Lawton and the town of Indianola on the south and Elgin and the town of Medicine Park on the north. The Wichita Mountains National Wildlife Refuge (NWR) is located adjacent to the Installation's northwestern property boundary.

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Sincerely,



Sarah Sminkey  
National Environmental Policy Act Coordinator  
Environmental Quality Division, Support Branch

Enclosures

Cc:

Lara Zuzak, AICP, PMP, Project Manager, URS Group, Inc.



**DEPARTMENT OF THE ARMY**  
**US ARMY INSTALLATION MANAGEMENT COMMAND**  
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL**  
**2515 Ringgold ROAD**  
**FORT SILL, OKLAHOMA 73503**

August 25, 2015  
(Via mail)

SUBJECT: Oklahoma Senate Coordination Letter  
Fire Mitigation Environmental Assessment  
U.S. Army Garrison Fort Sill, Oklahoma (Comanche County)

The Honorable Randy Bass  
Oklahoma Senate  
2300 N. Lincoln Blvd.  
Room 528B  
Oklahoma City, OK 73105

Dear Senator Bass:

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Sincerely,



Sarah Sminkey  
National Environmental Policy Act Coordinator  
Environmental Quality Division, Support Branch

Enclosures

Cc:

Lara Zuzak, AICP, PMP, Project Manager, URS Group, Inc.



**DEPARTMENT OF THE ARMY**  
**US ARMY INSTALLATION MANAGEMENT COMMAND**  
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL**  
**2515 Ringgold ROAD**  
**FORT SILL, OKLAHOMA 73503**

August 25, 2015  
(Via mail)

SUBJECT: United States House of Representative Coordination Letter  
Fire Mitigation Environmental Assessment  
U.S. Army Garrison Fort Sill, Oklahoma (Comanche County)

The Honorable Tom Cole  
United States Representative  
United States House of Representative  
711 S.W. "D" Avenue  
Suite 201  
Lawton, OK 73501

Dear Representative Cole:

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Sincerely,



Sarah Sminkey  
National Environmental Policy Act Coordinator  
Environmental Quality Division, Support Branch

Enclosures

Cc:

Lara Zuzak, AICP, PMP, Project Manager, URS Group, Inc.



**DEPARTMENT OF THE ARMY**  
**US ARMY INSTALLATION MANAGEMENT COMMAND**  
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL**  
**2515 Ringgold ROAD**  
**FORT SILL, OKLAHOMA 73503**

August 25, 2015  
(Via mail)

SUBJECT: United States Senate Coordination Letter  
Fire Mitigation Environmental Assessment  
U.S. Army Garrison Fort Sill, Oklahoma (Comanche County)

The Honorable Jim Inhofe  
United States Senator  
United States Senate  
1924 S. Utica Avenue  
Suite 530  
Tulsa, OK 74104

Dear Senator Inhofe:

The U.S. Army Garrison Fort Sill, Oklahoma (Installation or Ft. Sill) is located in Comanche County in southwestern Oklahoma about 50 miles north of Wichita Falls and 90 southwest of Oklahoma City (Figure 1). The Installation adjoins Cache and Lawton and the town of Indianola on the south and Elgin and the town of Medicine Park on the north. The Wichita Mountains National Wildlife Refuge (NWR) is located adjacent to the Installation's northwestern property boundary.

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In compliance with Federal laws and regulation, impacts to aquatic habitat and sensitive species habitat will be avoided and then minimized to the extent possible. The area planned for woody vegetation removal consists of approximately 430 acres of land and, prior to construction, ecological surveys will be conducted to identify the location of potential Federally-listed animal and plant species and their habitat. As an example, Black-capped Vireo (*Vireo atricapilla*) habitat will be avoided during construction of the proposed firebreak corridors.

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Sincerely,



Sarah Sminkey  
National Environmental Policy Act Coordinator  
Environmental Quality Division, Support Branch

Enclosures

Cc:  
Lara Zuzak, AICP, PMP, Project Manager, URS Group, Inc.



**DEPARTMENT OF THE ARMY**  
**US ARMY INSTALLATION MANAGEMENT COMMAND**  
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL**  
**2515 Ringgold ROAD**  
**FORT SILL, OKLAHOMA 73503**

August 25, 2015  
(Via mail)

SUBJECT: United States Senate Coordination Letter  
Fire Mitigation Environmental Assessment  
U.S. Army Garrison Fort Sill, Oklahoma (Comanche County)

The Honorable James Lankford  
United States Senator  
United States Senate  
1015 N. Broadway Avenue  
Suite 310  
Oklahoma City, OK 73102

Dear Senator Lankford:

The U.S. Army Garrison Fort Sill, Oklahoma (Installation or Ft. Sill) is located in Comanche County in southwestern Oklahoma about 50 miles north of Wichita Falls and 90 southwest of Oklahoma City (Figure 1). The Installation adjoins Cache and Lawton and the town of Indianola on the south and Elgin and the town of Medicine Park on the north. The Wichita Mountains National Wildlife Refuge (NWR) is located adjacent to the Installation's northwestern property boundary.

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Sincerely,



Sarah Sminkey  
National Environmental Policy Act Coordinator  
Environmental Quality Division, Support Branch

Enclosures

Cc:

Lara Zuzak, AICP, PMP, Project Manager, URS Group, Inc.



**DEPARTMENT OF THE ARMY**  
**US ARMY INSTALLATION MANAGEMENT COMMAND**  
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL**  
**2515 Ringgold ROAD**  
**FORT SILL, OKLAHOMA 73503**

August 25, 2015  
(Via mail)

**SUBJECT: Wichita Mountains National Wildlife Refuge - Refuge Headquarters Coordination Letter**  
**Fire Mitigation Environmental Assessment**  
**U.S. Army Garrison Fort Sill, Oklahoma (Comanche County)**

Mr. Tony Booth  
Refuge Manager  
Wichita Mountains National Wildlife Refuge - Refuge Headquarters  
32 Refuge Headquarters  
Indiahoma, OK 73552

Dear Mr. Booth:

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Sincerely,



Sarah Sminkey  
National Environmental Policy Act Coordinator  
Environmental Quality Division, Support Branch

Enclosures

Cc:  
Lara Zuzak, AICP, PMP, Project Manager, URS Group, Inc.

**Appendix C**  
**Cultural Resources Consultation**



## Oklahoma Archeological Survey

THE UNIVERSITY OF OKLAHOMA

NOV 16 2015

October 27, 2015

Kevin Christopher  
Directorate of Public Works  
Environmental Quality Division  
ATTN: IMSI-PWE  
2593 Currie Road  
Fort Sill, OK 73503

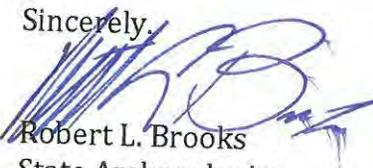
Re: Proposed construction of firebreaks and removal of woody  
Vegetation, Fort Sill, Comanche County, Oklahoma.

Dear Mr. Christopher:

In a letter dated October 15, 2015, the Archeological recommended a survey for the above referenced action with a caution that 34CM102 was within the APE for the proposed action. Please disregard this letter. In a telephone conversation, you indicated that 34CM102 was not within the APE. Furthermore, the accompanying documentation with the original request for comment notes that the firebreaks fall within previously surveyed areas with no eligible archaeological resources present. (I will assume you meant no eligible sites or sites where their eligibility has not been determined.) The only conditional areas are those where UXOs exist. Here, fuel reduction must await clearing of ordinance from these areas, as must the survey for cultural resources. Thus, there is no need for further archaeological survey of the firebreaks (with the exception noted). I saw that monitoring would occur during the clearing process to document unanticipated discoveries.

This review has been conducted in cooperation with the State Historic Preservation Office, Oklahoma Historical Society.

Sincerely,

  
Robert L. Brooks  
State Archaeologist

Cc: SHPO





## Oklahoma Historical Society

Founded May 27, 1893

### State Historic Preservation Office

Oklahoma History Center • 800 Nazih Zuhdi Drive • Oklahoma City, OK 73105-7917  
(405) 521-6249 • Fax (405) 522-0816 • [www.okhistory.org/shpo/shpom.htm](http://www.okhistory.org/shpo/shpom.htm)

October 22, 2015

Mr. Kevin Christopher  
Environmental Support Branch  
DPW-EQD ATTN: IMSI-PWE/K.Christopher  
2515 Ringgold Road  
Fort Sill, OK 73503

RE: File #0072-16; Fort Sill Proposed Construction of Six Firebreaks and Removal of Woody Vegetation Project, Fort Sill, Comanche County

Dear Mr. Christopher:

We have received and reviewed the materials for the referenced undertaking submitted with your letter dated October 5, 2015. We concur with the defined area of potential effect (APE) with respect to both direct and indirect impacts for this project and consider it appropriate for the scope of work.

We have no additional agencies or organizations to suggest as possible consulting parties for the proposed undertaking other than those noted in your letter.

Based on the information you have provided about this project and in keeping with your request per expedited consultation, unless you receive conflicting comments from the Oklahoma Archeological Survey, we find no historic properties affected by the undertaking.

Thank you for the opportunity to review this project. If you have any questions, please call Catharine M. Wood, Historical Archaeologist, at 405/521-6381. Please reference the above underlined file number when responding. Thank you.

Sincerely,

Melvena Heisch  
Deputy State Historic  
Preservation Officer

MH:pm

OCT 28 2015

OCT 22 2015  
MDW RCV'D



## Oklahoma Archeological Survey

THE UNIVERSITY OF OKLAHOMA

October 115, 2015

Glenn A. Waters  
US Army Garrison Fort Sill  
462 Hamilton Road, Ste. 120  
Fort Sill, Oklahoma 73503

RE: Proposed construction of firebreaks and removal of woody vegetation on Fort Sill;  
Comanche County, Oklahoma.

Dear Mr. Waters:

The above referenced project has been reviewed by the Community Assistance Program staff of this agency to identify potential areas that may contain prehistoric or historic archaeological materials (historic properties). The location of your project has been cross-checked with the state site files containing approximately 23,000 archaeological sites which are currently recorded for the state of Oklahoma. Site(s) are listed in your project area (**34CM-102**), and based on the topographic and hydrologic setting of your project, archeological materials are likely to be encountered. **An archaeological field inspection is therefore considered necessary prior to project construction in order to identify significant archaeological resources that may exist in your area.** Please contact this office at (405) 325-7211 if you require additional information on this project.

This environmental review and evaluation is performed in order to locate, record, and preserve Oklahoma's prehistoric and historic cultural heritage in cooperation with the State Historic Preservation Office, Oklahoma Historical Society, and you must also have a letter from that office to document your consultation pursuant to Section 106 of the National Historic Preservation Act. In addition to our review comments, under 36CFR Part 800.3 you are reminded of your responsibility to consult with the appropriate Native American tribe/groups to identify any concerns they may have pertaining to this undertaking and potential impacts to properties of traditional and/or ceremonial value. Thank you for your cooperation.

Sincerely,

Cody L. Dalpra  
Staff Archaeologist

Robert L. Brooks  
State Archaeologist

cc: SHPO





REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
**US ARMY INSTALLATION MANAGEMENT COMMAND**  
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL**  
**OFFICE OF THE GARRISON COMMANDER**  
**462 HAMILTON ROAD, SUITE 120**  
**FORT SILL, OKLAHOMA 73503**

Environmental Quality Division

OCT 05 2015

Dr. Bob Blackburn  
State Historic Preservation Office  
Oklahoma History Center  
800 Nazih Zuhdi Drive  
Oklahoma City, OK 73105-7917

CERTIFIED MAIL: 7015 0640 0006 3438 0038

RE: Area of Potential Effects (APE) Establishment and Expedited Consultation Request for Construction of Firebreaks and the Removal of Woody Vegetation on Fort Sill, Comanche County, Oklahoma

Dear Dr. Blackburn:

Fort Sill proposes to construct six firebreaks and remove woody vegetation within the confines of Fort Sill as outlined in Chapters 1 and 2 of the Fire Mitigation Environmental Assessment. This project meets the definition of an undertaking per 36 CFR 800.3(a). Fort Sill has further determined that regarding 36 CFR 800.3(a)(1), the undertaking is the type of activity that has the potential to cause effects on historic properties, assuming such historic properties were present. As such, this undertaking is subject to review under the National Historic Preservation Act (54 U.S.C. § 300101 et seq.).

Overall, this correspondence initiates the consultation process by seeking your agreement with the following:

- a. Fort Sill's request for expedited consultation thereby allowing Fort Sill to herein address multiple steps of the consultation process;
- b. The identification of your office as the only applicable Historic Preservation Office;
- c. The determination that there are no properties that are eligible for the National Register of Historic Places (NRHP) that may be affected by this project;
- d. The direct areas of potential effects (APEs) and the absence of indirect APEs as described by Fort Sill below and shown in enclosure 2;
- e. The identification of your office, the Oklahoma Archeological Survey (OAS), the Fort Sill affiliated Native American tribes, and the general public as the only applicable consulting parties;

- f. The concurrent provision of the project information to the OAS to for their input as the SHPO's official representative for prehistoric archeological matters in the consultation process and;
- g. The plan to involve the public as outlined below.

Unless your office provides written comments specifically indicating that the Oklahoma State Historic Preservation Office (SHPO) does not concur with an above referenced finding or action, Fort Sill will continue the consultation process on the premise that your office agrees with the determinations and actions for this undertaking as described in this letter.

In addition to describing the proposed action, this letter delineates the Army's proposed APEs for this undertaking and the steps Fort Sill will take to identify consulting parties and notify the public of the project. Fort Sill respectfully requests your concurrence with the proposed APEs pursuant to 36 CFR 800.4(a)(1). Additionally, Fort Sill requests your agreement to conduct expedited consultation for this undertaking in accordance with 36 CFR 800.3(g).

The undertaking will occur entirely on the Fort Sill Military Reservation in the state of Oklahoma. The Fort Sill Military Reservation is solely under the jurisdiction of the federal government and contains no tribal land. As such, under 36 CFR 800.3(c), Fort Sill has determined the only applicable Historic Preservation Office to be your office, the Oklahoma State Historic Preservation Office (SHPO), located in Oklahoma City, Oklahoma.

The undertaking involves the construction of 6 new firebreaks and the removal of woody vegetation in specific areas along the perimeter fencing and in the North Carlton area. Note that although the map at enclosure 1 shows 5 firebreaks, the very most northern firebreak is actually classified as 2 separate firebreaks. Chapter 2 of the enclosed draft Fire Mitigation Environmental Assessment's Description of the Proposed Action and Alternatives (DOPAA) located at enclosure 3 provides the specific details and alternative considerations. Fort Sill already actively mitigates fire risks by maintaining existing firebreaks (corridors denuded of vegetation) and fuel load management techniques that involve the control of agricultural activities on leases and removal of grassy and woody vegetation along fences and within military quarters during grounds maintenance. In addition, the Installation conducts prescribed burns to control vegetation and encourage healthy re-growth, cuts down fire wood/timber on their timber leases, and clears mesquite trees and brush that exhibit a high, dense fuel load. Existing conditions, including strong winds and areas with high fire fuel loads, result in the potential for extremely high risk to human health and the environment during fires and potential for wild fires to occur. The presence of unexploded ordnance (UXO) and the potential occurrence of fast-moving fires at the Installation also cause traditional firefighting methods to be dangerous to humans and wildlife. The conditions and results caused by recent wild fires in the Fort Sill area, especially the 2011 Medicine Park fires, indicate that additional fire mitigation is necessary at the Installation. The planned additional fire mitigation activities include construction/maintenance of six, 40-foot wide, interior firebreaks within both of the East and West Training Ranges which total six miles of new firebreaks; mechanical removal of woody and grassy vegetation for 15 to 800 feet along each side of specific roadways that total 34 miles and 430 acres; and, the implementation of approved aerial spraying measures using best management practices to remove vegetation and reduce the fuel load in areas that are constrained for mechanical clearing by existing UXO or are otherwise inaccessible.

There are no indirect APEs delineated for this project since all aspects of the proposed undertaking will be at ground surface. There are proposed firebreaks that are currently in both duded and non-duded impact areas (East Range) that require UXO removal and archaeological surveys before work can be conducted. The firebreaks on surveyed lands (West Range) will be created with spot monitoring by Cultural Resource Staff personnel.

Consistent with 36 CFR 800.4(a)(2), Fort Sill has reviewed existing information in its cultural resources files to identify any known prehistoric or historic resources, including districts, buildings, structures, objects and/or sites, within the proposed APEs of the undertaking. There are no standing resources within the proposed APEs. The APEs for the West Range firebreaks were surveyed for archeological resources and recorded in Duane Peter et al, *Geo-Marine: 1990-1991 Archeological Survey of selected parcels of the Fort Sill Military Reservation. Fort Sill, Oklahoma. Report of Investigations No. 1* and in Ferring's 1978 report *An Archaeological Reconnaissance of Fort Sill Oklahoma. Contributions of the Museum of the Great Plains, Number 6, Lawton, Oklahoma*. No eligible archaeological resources were located in the proposed firebreaks area of the West Range.

In addition to your office, Fort Sill has identified the OAS and eight of the Fort Sill affiliated Native American tribes (the Apache Tribe of Oklahoma, the Cheyenne and Arapaho Tribes of Oklahoma, the Delaware Nation, the Caddo Nation, the Wichita and Affiliated Tribes, the Comanche Nation, the Fort Sill Apache Tribe of Oklahoma and the Kiowa Indian Tribe of Oklahoma) as entities entitled to be consulting parties per 36 CFR 800.3(f). As such, the tribes and the OAS will be informed of this undertaking and invited to participate as consulting parties. The Chickasaw Nation will not be invited to participate as a consulting party due to their March 15, 2010 correspondence to Fort Sill which stated "There are no known historically significant or sacred properties to the Chickasaw Nation under the jurisdiction of the agency. Therefore, we do not need to consult under the NHPA at the Fort Sill Military Reservation". Because no local governments have jurisdiction over Fort Sill, no city or county entities will be directly invited to participate. However, as allowed under 36 CFR 800.3(f)(3), if any local government agency submits a written request to the designated Fort Sill official representative to participate as a consulting party, Fort Sill will consult with your office to determine the appropriateness of such action. At this time, Fort Sill also asks for your input in identifying any additional potential consulting parties.

It is Fort Sill's intent to gather information from all consulting parties to identify any cultural, historic, sacred or religious concerns in the undertaking areas per 36 CFR 800.4(a)(3). This information will be requested from the consulting parties within 30 days of receipt of the consultation packages.

As required by 36 CFR 800.3(e) and consistent with 36 CFR 800.2(d), Fort Sill's plan to involve the public includes the following actions. The public will be informed of this undertaking via public notification in the Lawton Constitution, a daily newspaper serving the Lawton and Fort Sill areas. In the notification, the public's input will be solicited regarding the undertaking and its potential effects on historic properties. The public notice will also convey that the undertaking documentation will be publicly available at the Lawton Public Library, 110 SW 4th, Lawton, OK for a 30 day comment period. In the event of a finding of No Historic Properties Affected (36 CFR 800.4(d)(1)) or of an Adverse Effect to Historic Properties (36 CFR 800.6(a)(4)), a second notice will be published notifying the public that the undertaking documentation is available at the Lawton Public Library for a 15 day comment period. All written comments submitted by the public to the designated Fort Sill official representative will be given consideration in the decision making process per 36 CFR 800.2(d)(2).

In accordance with 36 CFR 800.3(b), Fort Sill will coordinate all consultation steps as appropriate with reviews under other authorities, including the Archaeological Resources Protection Act, American Indian Religious Freedom Act, Religious Freedoms Restoration Act, the Native American Graves Protection and Repatriation Act, and Executive Order 13007 Indian Sacred Sites.

Mr. Kevin Christopher, Environmental Support Branch, has been designated as Fort Sill's official representative for all matters dealing with this undertaking. He can be reached via telephone at (580) 442-5671. All written correspondence should be directed to the following address: Directorate of Public Works, Environmental Quality Division, Attn: IMSI-PWE (K. Christopher), 2515 Ringgold Road, Fort Sill, OK 73503.

As this action is part of a larger plan, Fort Sill is enclosing the draft Description of the Proposed Action and Alternatives (DOPAA) for your information.

If comments are not received from your office within 30 days of receipt of this letter, it is assumed you concur with the use of expedited consultation, the proposed APEs, the consulting parties as identified, and the plans to inform the public about the project.

As always, Fort Sill looks forward to working with your office on the preservation of our cultural heritage.

Sincerely,

A handwritten signature in black ink, appearing to read "Glenn A. Waters", with a long horizontal line extending to the right from the end of the signature.

Glenn A. Waters  
Colonel, U.S. Army  
Garrison Commander

Enclosures

1. Location Map
2. APE Maps
3. Draft DOPAA



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
US ARMY INSTALLATION MANAGEMENT COMMAND  
HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL  
OFFICE OF THE GARRISON COMMANDER  
462 HAMILTON ROAD, SUITE 120  
FORT SILL, OKLAHOMA 73503

Environmental Quality Division

OCT 05 2015

Dr. Robert Brooks  
Oklahoma State Archeologist  
Oklahoma Archeological Survey  
111 E. Chesapeake  
Norman, OK 73019-0575

CERTIFIED MAIL: 7015 0640 0006 3438 0045

RE: Construction of Firebreaks and the Removal of Woody Vegetation on Fort Sill, Comanche County, Oklahoma

Dear Dr. Brooks:

Fort Sill proposes to construct six firebreaks and remove woody vegetation within the confines of Fort Sill as outlined in Chapters 1 and 2 of the Fire Mitigation Environmental Assessment. This project meets the definition of an undertaking per 36 CFR 800.3(a). Fort Sill has further determined that regarding 36 CFR 800.3(a)(1), the undertaking is the type of activity that has the potential to cause effects on historic properties, assuming such historic properties were present. As such, this undertaking is subject to review under the National Historic Preservation Act (54 U.S.C. § 300101 et seq.).

The inclusion of your office in the first phase of the consultation process is in keeping with the cooperative agreement between your office and the Oklahoma State Historic Preservation Office (SHPO) under which you provide written comments as the SHPO's official representative on prehistoric archeological matters in the Section 106 process.

The purpose of this letter is to inform you of the undertaking and solicit your comments as a consulting party in the consultation process for this undertaking relative to 36 CFR 800.3(f). In addition to describing the proposed action, this letter will also delineate the Army's proposed areas of potential effect (APE) for this undertaking, identify the other entities that will be invited to be consulting parties to this undertaking and describe the plan to involve the public. If the SHPO does not concur with the proposed APEs or the request to conduct expedited consultation per 36 CFR 800.3(g), Fort Sill will provide the revised information to your office for consideration as appropriate.

The undertaking involves the construction of 6 new firebreaks and the removal of woody vegetation in specific areas along the perimeter fencing and in the North Carlton area. Note that although the map at enclosure 1 shows 5 firebreaks, the very most northern firebreak is actually classified as 2 separate firebreaks. Chapter 2 of the enclosed draft Fire Mitigation Environmental Assessment's Description of the Proposed Action and Alternatives (DOPAA) located at enclosure 3 provides the specific details and alternative considerations. Fort Sill already actively mitigates fire risks by maintaining existing firebreaks (corridors denuded of vegetation) and fuel load management techniques that involve the control of agricultural activities on leases and removal of grassy and woody vegetation along fences and within military quarters during grounds maintenance. In

In addition, the Installation conducts prescribed burns to control vegetation and encourage healthy re-growth, cuts down fire wood/timber on their timber leases, and clears mesquite trees and brush that exhibit a high, dense fuel load. Existing conditions, including strong winds and areas with high fire fuel loads, result in the potential for extremely high risk to human health and the environment during fires and potential for wild fires to occur. The presence of unexploded ordnance (UXO) and the potential occurrence of fast-moving fires at the Installation also cause traditional firefighting methods to be dangerous to humans and wildlife. The conditions and results caused by recent wild fires in the Fort Sill area, especially the 2011 Medicine Park fires, indicate that additional fire mitigation is necessary at the Installation. The planned additional fire mitigation activities include construction/maintenance of six, 40-foot wide, interior firebreaks within both of the East and West Training Ranges which total six miles of new firebreaks; mechanical removal of woody and grassy vegetation for 15 to 800 feet along each side of specific roadways that total 34 miles and 430 acres; and, the implementation of approved aerial spraying measures using best management practices to remove vegetation and reduce the fuel load in areas that are constrained for mechanical clearing by existing UXO or are otherwise inaccessible.

There are no indirect APEs delineated for this project since all aspects of the proposed undertaking will be at ground surface. There are proposed firebreaks that are currently in both duded and non-duded impact areas (East Range) that require UXO removal and archaeological surveys before work can be conducted. The firebreaks on surveyed lands (West Range) will be created with spot monitoring by Cultural Resource Staff personnel.

Consistent with 36 CFR 800.4(a)(2), Fort Sill has reviewed existing information in its cultural resources files to identify any known prehistoric or historic resources, including districts, buildings, structures, objects and/or sites, within the proposed APEs of the undertaking. There are no standing resources within the proposed APEs. The APEs for the West Range firebreaks were surveyed for archeological resources and recorded in Duane Peter et al, *Geo-Marine: 1990-1991 Archeological Survey of selected parcels of the Fort Sill Military Reservation. Fort Sill, Oklahoma. Report of Investigations No. 1* and in Ferring's 1978 report *An Archaeological Reconnaissance of Fort Sill Oklahoma. Contributions of the Museum of the Great Plains, Number 6, Lawton, Oklahoma*. No eligible archaeological resources were located in the proposed firebreaks area of the West Range.

Pursuant to 36 CFR 800.4, Fort Sill is seeking information from you concerning properties within the APEs which are of, or have the potential to be of, archeological significance. Fort Sill is also particularly interested as to whether your office is aware of issues that the OAS, or any other interested party, may have concerning the undertaking's potential effects on historic properties relative to the Archaeological Resources Protection Act, 16 U.S.C. § 470aa et seq.

In addition to the SHPO and your office, Fort Sill is also providing the information about the undertaking to eight of the Fort Sill affiliated Native American tribes with an invitation to be a consulting party to this undertaking per 36 CFR 800.3(f). The eight Fort Sill affiliated tribes entitled to be consulting parties consist of the Apache Tribe of Oklahoma, the Cheyenne and Arapaho Tribes of Oklahoma, the Delaware Nation, the Caddo Nation, the Wichita and Affiliated Tribes, the Comanche Nation, the Fort Sill Apache Tribe of Oklahoma and the Kiowa Indian Tribe of Oklahoma. The Chickasaw Nation will not be invited to participate as a consulting party due to their March 15, 2010 correspondence to Fort Sill which stated "There are no known historically significant or sacred properties to the Chickasaw Nation under the jurisdiction of the agency. Therefore, we do not need to consult under the NHPA at the Fort Sill Military Reservation."

It is Fort Sill's intent to gather information from all consulting parties to identify any cultural, historic, sacred or religious concerns in the area of the undertaking per 36 CFR 800.4(a)(3). This information will be requested from the consulting parties within 30 days of receipt of the consultation packages.

As required by 36 CFR 800.3(e) and consistent with 36 CFR 800.2(d), Fort Sill's plan to involve the public includes the following actions. The public will be informed of this undertaking via public notification in the Lawton Constitution, a daily newspaper serving the Lawton and Fort Sill areas. In the notification, the public's input will be solicited regarding the undertaking and its potential effects on historic properties. The public notice will also convey that the undertaking documentation will be publicly available at the Lawton Public Library, 110 SW 4th, Lawton, OK for a thirty (30) day comment period. In the event of a finding of No Historic Properties Affected (36 CFR 800.4(d)(1)) or of an Adverse Effect to Historic Properties (36 CFR 800.6(a)(4)), a second notice will be published notifying the public that the undertaking documentation is available at the Lawton Public Library for a fifteen (15) day comment period. All written comments submitted by the public to the designated Fort Sill official representative will be given consideration in the decision making process per 36 CFR 800.2(d)(2).

In accordance with 36 CFR 800.3(b), Fort Sill will coordinate all consultation steps as appropriate with reviews under other authorities, including the Archaeological Resources Protection Act, American Indian Religious Freedom Act, Religious Freedoms Restoration Act, the Native American Graves Protection and Repatriation Act, and Executive Order 13007 Indian Sacred Sites.

Mr. Kevin Christopher, Environmental Support Branch, has been designated as Fort Sill's official representative for all matters dealing with this undertaking. He can be reached via telephone at (580) 442-5671. All written correspondence should be directed to the following address: Directorate of Public Works, Environmental Quality Division, Attn: IMSI-PWE (K. Christopher), 2593 Currie Road, Fort Sill, OK 73503.

If comments are not received from your office within 30 days of receipt of this letter, we will continue the consultation process with the understanding that the OAS is aware of no historic or prehistoric properties, including archeological sites, within the APEs and has no concerns with the undertaking's potential effects to historic properties.

As this action is part of a larger plan, Fort Sill is enclosing the draft Description of the Proposed Action and Alternatives (DOPAA) for your information.

As always, Fort Sill looks forward to working with your office on the preservation of our cultural heritage.

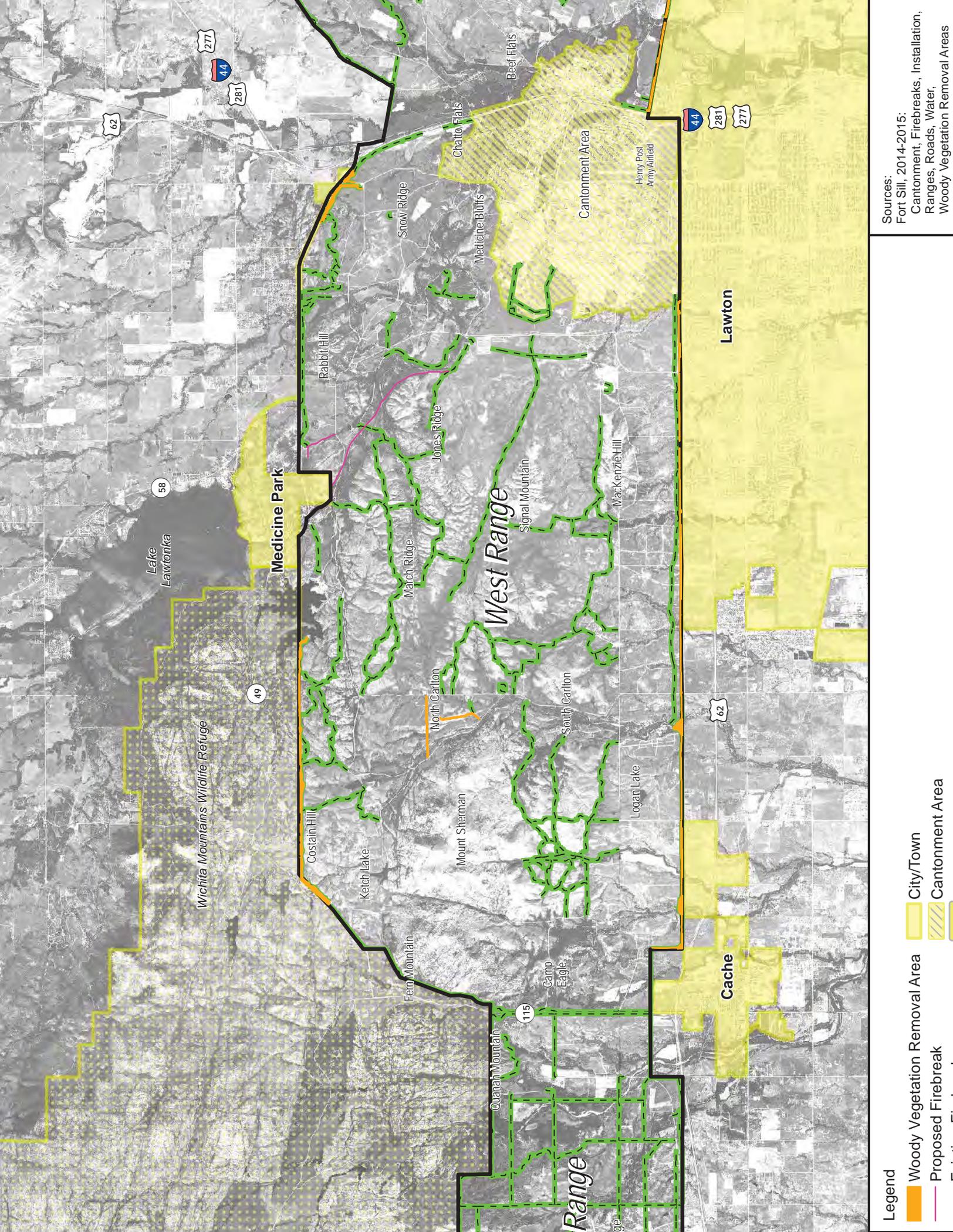
Sincerely,



Glenn A. Waters  
Colonel, U.S. Army  
Garrison Commander

Enclosures

1. Location Map
2. APE Maps
3. Draft DOPAA



**Legend**

-  Woody Vegetation Removal Area
-  Cantonment Area
-  Proposed Firebreak
-  City/Town

Sources:  
 Fort Sill, 2014-2015:  
 Cantonment, Firebreaks, Installation,  
 Ranges, Roads, Water,  
 Woody Vegetation Removal Areas

# Fire Mitigation

**Legend**

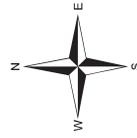
 APE, existing trail +/- 30m



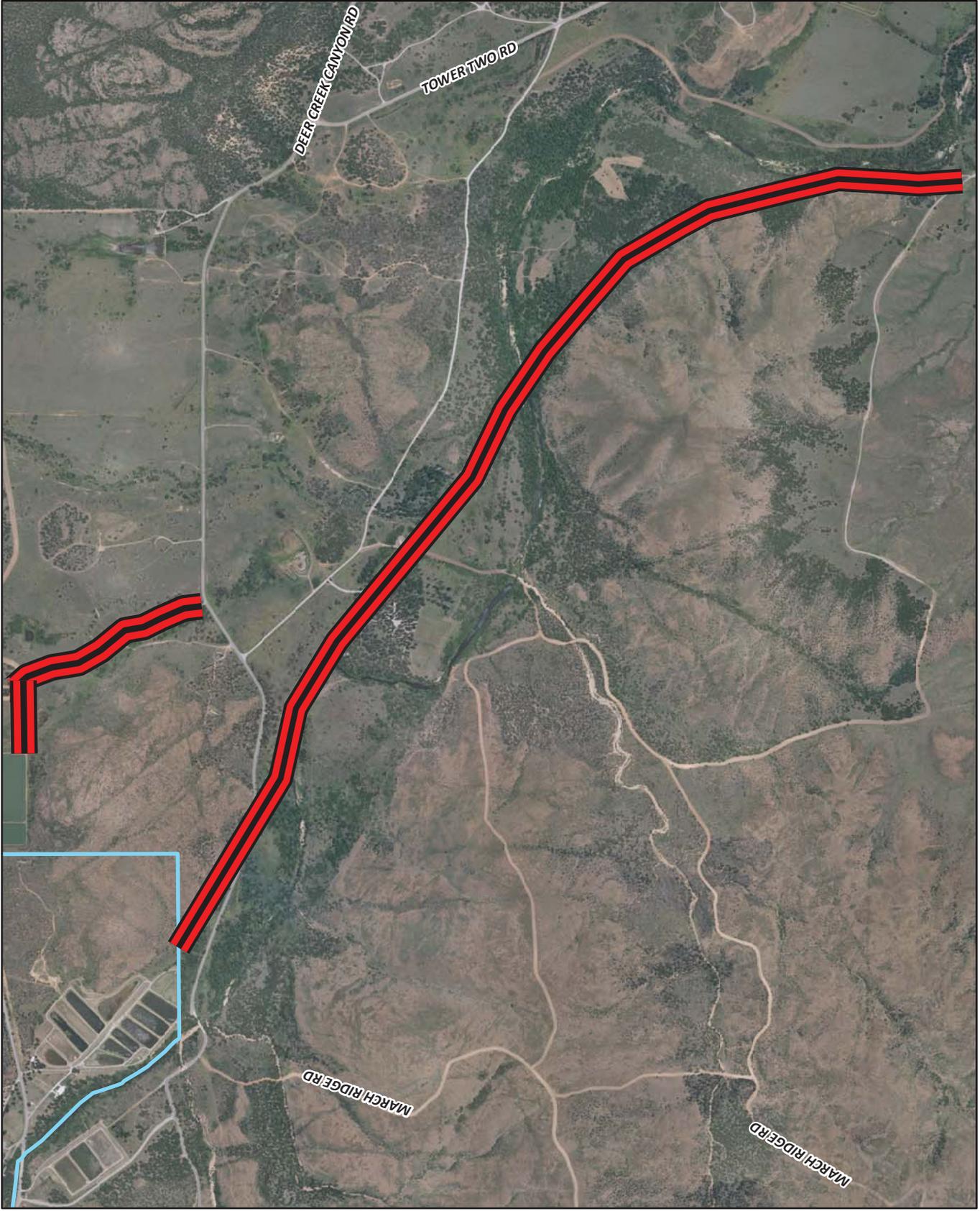
DIRECTORATE OF PUBLIC WORKS (DPW)  
 ENVIRONMENTAL SERVICES DIVISION  
 CULTURAL RESOURCES BRANCH  
 FORT SILL, OKLAHOMA  
 KEVIN T. CHRISTOPHER  
 REVISED: FRIDAY, AUGUST 28, 2015

**THE GEOSPATIAL DATA DEPICTED IN THIS MAP  
 COMPLIES WITH (SDS) FHE) STANDARDS**

Datum: World Geodetic Survey 1984 (WGS84)  
 Projection: Universal Transverse Mercator (UTM Zone 14N)  
 Aerial: July, 2014



**ELEVATION GUIDE/ORIENTATION**



# Fire Mitigation

## Legend

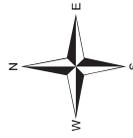
 APE, existing trail +/- 30m



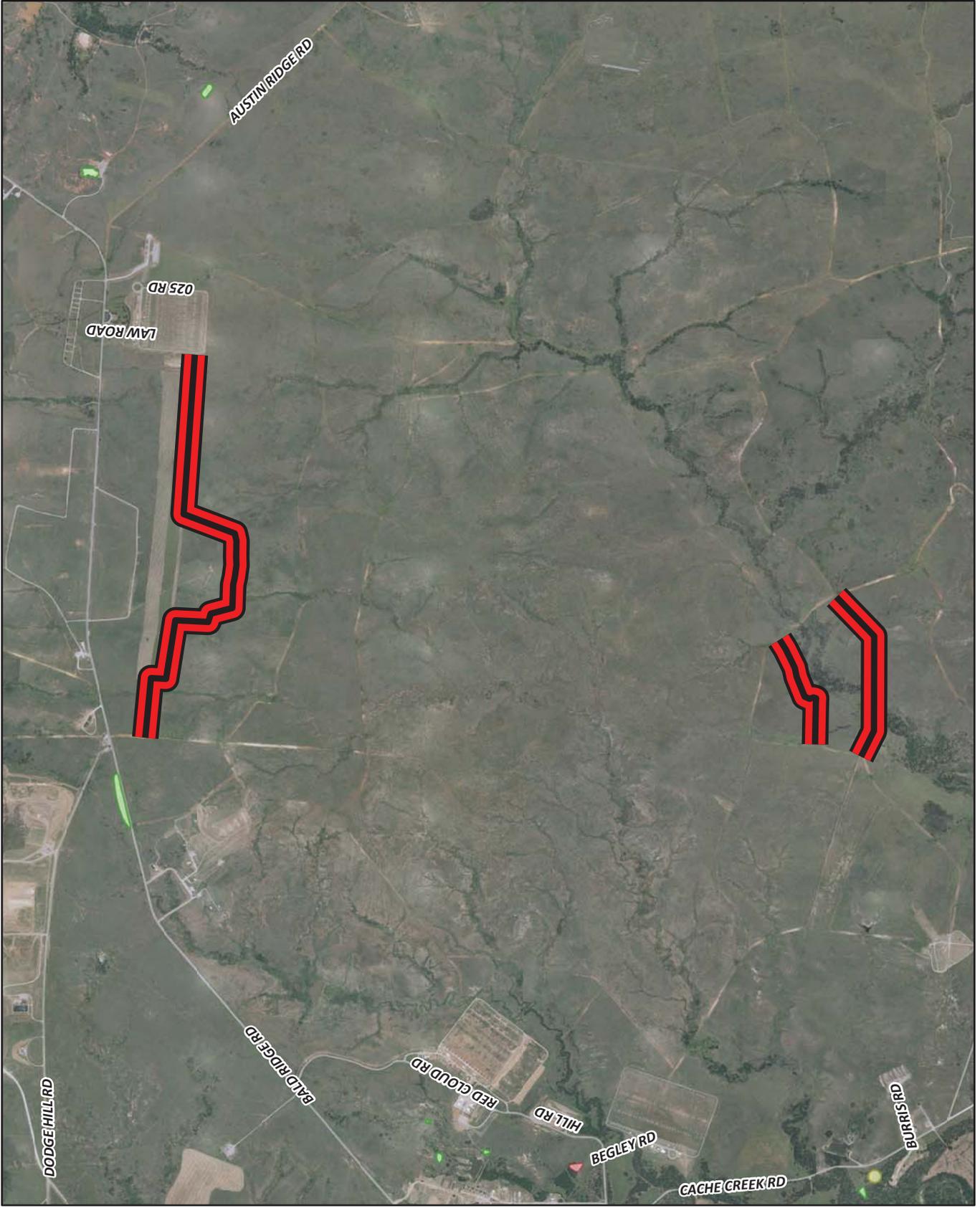
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 FORT SILL, OKLAHOMA  
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 REVISED: FRIDAY, AUGUST 28, 2015

THE GEOSPATIAL DATA DEPICTED IN THIS MAP  
 COMPLIES WITH (SDSFE) STANDARDS

Datum: World Geodetic Survey 1984  
 (WGS84)  
 Projection: Universal Transverse Mercator  
 (UTM Zone 14N)  
 Aerial: July, 2014



## ELEVATION GUIDE/ORIENTATION



ABSOLUTE SCALE  
 1:29,865  
 RELATIVE SCALE  
 1 INCH = 2,499 FEET



Fire Mitigation

# **OA Systems Corporation**

2201 Civic Circle, Suite 511 • Amarillo, Texas 79109 • (806) 354-8218 • FAX (806) 359-3718



**DRAFT**

**FIRE MITIGATION ENVIRONMENTAL  
ASSESSMENT  
Description of the Proposed Action and Alternatives  
(Chapters 1 and 2)**

**FOR**

**FORT SILL, OKLAHOMA**

**Contract No. W912BV-10-D-2013  
Task Order 0003**

July 2015

Prepared for:

U.S. Army Corps of Engineers, Tulsa District  
and  
Fort Sill, Oklahoma

Prepared by:  
URS Group, Inc.  
9400 Amberglen Blvd.  
Austin, TX 78729

(for OA Systems Corporation)

ENCL 3

# Fire Mitigation

## **Signature Page**

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# Fire Mitigation

## **Cover Sheet**

(including any distribution language)

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## Appendices

Appendix A - Detailed Maps of Wood Vegetation Removal

## List of Acronyms

§/§§	Section/Sections
AOC	Area of Concern
ADA (military)	U.S. Army Air Defense Artillery
AR	Army Regulation
ASSON	Aerial Spray Statement of Need
BCVI	Black-Capped Vireo
BMP	Best Management Practice
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
COR	Contracting Officer's Representative
DD	Department of Defense (acronym for forms)
DoD	Department of Defense
DOPAA	Description of the Proposed Action and Alternatives
DPW	Directorate of Public Works
DPTMS	Directorate of Plans, Training, Mobilization, and Security
EA	Environmental Assessment
e.g.	<i>exempli gratia</i> (Latin) or for example
EO	Executive Order
EQD	Environmental Quality Division
FBER	Firebreak East Range
FBWR	Firebreak West Range
FNSI	Finding of No Significant Impact
FR	Federal Register
ft	foot/feet
Ft.	Fort
IA	Impact Area
IA-JRA	Impact Area - Jones Ridge Area
IA-SCA	Impact Area-South Carlton Area
IA-SMA	Impact Area- Scorpion Mountain Area
IAW	in agreement with
IPM	Integrated Pest Management
IPMC	Installation Pest Management Coordinator
IPMP	Integrated Pest Management Plan
ITAM	Integrated Training Area Management
KHM	Kerr Hill Machine Gun Range
KO	Contracting Officer
n.d.	no date
NDRA	Non-Dudded Range Area
NDRA-JRA	Non-Dudded Range Area - Jones Ridge Area
NDRA-NCA	Non-Dudded Range Area - North Carlton Area
NDRA-SCA	Non-Dudded Range Area - South Carlton Area
NDRA-SMA	Non-Dudded Range Area – Scorpion Mountain Area

# Fire Mitigation

DRAFT

Fire Mitigation EA (Ch 1 and 2)

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NEPA	National Environmental Policy Act of 1969 (P.L. 91-190, 42 U.S.C. 4321-4347, January 1, 1970, 83 Stat. 852) as amended (P.L. 94-52, July 3, 1975, 89 Stat. 258, and P.L. 94-83, August 9, 1975, 89 Stat. 424)
NIC	Night Infiltration Course
NOA	Notice of Availability
NWR	National Wildlife Refuge
PEA	Programmatic Environmental Assessment
PMO	Pest Management Office
SOP	Standard Operating Procedure
TA	Training Area
TE	Task Element
USAEC	U.S. Army Environmental Command
U.S.	United States
USC	United States Code
UXO	Unexploded Ordnance
WVRA	Woody Vegetation Removal Areas

## CHAPTER 1 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

### 1.1 Introduction

This Environmental Assessment (EA) analyzes and documents the potential environmental consequences of fire mitigation strategies proposed within the United States (U.S.) Army Garrison Fort Sill (Fort Sill or Installation), Oklahoma. Fort (Ft.) Sill is located in Comanche County in southwestern Oklahoma (Figure 1.1-1). The Installation consists of 93,641 acres with a cantonment area (military quarters) of 7,066 acres and 85,985 acres of ranges. Approximately 56 percent (56%) of the ranges or approximately 48,152 acres are used for training, and the remainder consists of impact areas where use of ordnance and demolitions occurs. Impact Areas have limited uses due to the danger to personnel and equipment. Thirty-eight of the 45 range/course/facilities are used for live fire and training, which occurs year round. The Installation stretches approximately 27 miles in an east-west direction and approximately 4 to 9 miles in a north-south direction.

The Installation is located approximately 90 miles southwest of Oklahoma City and approximately 50 miles north of Wichita Falls. Interstate 44 intersects the eastern portion of the Installation. The City of Elgin and Town of Medicine Park are located on the Installation's northern border. The Cities of Cache and Lawton and the Town of Indianahoma are located on the southern border of the Installation. The Wichita Mountains National Wildlife Refuge (NWR) is located adjacent to the Installation's northwestern boundary.

In 1869, Ft. Sill was established to protect and maintain order in the "Kiowa, Comanche, and Apache Reservation" (All Consulting, LLC 2014, 1-1). Since that time, it has served in all major American military actions domestically and internationally. The Installation is home to the U.S. Army Fires Center of Excellence, the 75<sup>th</sup> and 214<sup>th</sup> Fire Brigades, the 428<sup>th</sup> and 434<sup>th</sup> Field Artillery Brigades, and the Armed Forces Reserve Center. It is one of five locations for Army Basic Combat Training (Leidos Engineering LLC 2014, 1-1). The Installation's mission is to train soldiers and develop U.S. Army Air Defense Artillery (ADA) leaders, design and develop fire support for the force, support unit training and readiness, mobilize and deploy operating forces, and maintain the Installation's infrastructure and services.

The Installation has several ranges, including ground and aerial bombing (Leidos Engineering LLC 2014, 1-1). The U.S. Army, Air Force, Navy, and other aircraft use the airspace around Ft. Sill and the ranges for training. The East Range is located on the eastern portion of Ft. Sill and is used primarily for small arms training (Figure 1.1-2). The West Range is located on the western side of Ft. Sill and used mostly for artillery and live ammunition aircraft bombing. The Quanah/Falcon Range surrounds the Falcon Air Force Reserve Bombing Range, which is used by fixed and rotary wing aircraft for laser targeting. This Range is used by the U.S. Army, Air Force, Marines, and Euro-North Atlantic Treaty Organization nations to train pilots and ground forces in the use of tactical aircraft. The cantonment area is located adjacent to the corporate limits of Lawton, Oklahoma. Ft. Sill's training exercises can result in unexploded ordnance (UXO); these can include explosive weapons (e.g. bombs, bullets, shells, and grenades) and pose a threat of future detonation.

## 1.2 Purpose and Need

The purpose of the proposed action is to provide increased fire protection for the Installation and nearby communities through fire mitigation by preventing and controlling fast-moving fires while also minimizing possible injuries and deaths associated with firefighting by personnel in areas with UXO. The proposed action of increased fire protection will support Ft. Sill's mission to train the U.S. military for the defense of the U.S. and fulfillment of the military directives of the President and Secretary of Defense under the guidance of the Department of Defense (DoD).

Recent fires illustrate the need for this proposed action. Between March 2012 and July 2013, 148 documented fires due to natural conditions and/or training exercises occurred within the Installation (Directorate of Plans, Training, Mobilization, and Security 2013, 8). Between 2009 and 2011, four began on the Installation and then spread off of the Installation (Directorate of Plans, Training, Mobilization, and Security 2013, 11). Of these, two occurred along the border of the Installation and Wichita Mountains National Wildlife Refuge, one within the Town of Medicine Park, and another on the eastern edge of the Installation. The June 29, 2011 fire within Medicine Park required evacuation of approximately 1,500 residents and destroyed 13 homes (News 9 2011). This fire originated on an impact area of Ft. Sill's West Range and spread over 4,000 acres on the Installation before it crossed Highway 49 and entered Medicine Park. Fire crews found it difficult to fight the fire due to the wind and dense vegetation. Approximately 1,500 acres outside the Installation and within and adjacent to Medicine Park were burned. Bulldozers and water delivered by helicopter were used to control the fire. Figure 1.2-1 illustrates the approximate extent of the 2011 Medicine Park Fire within Ft. Sill and Medicine Park (Peterson 2015).

Conditions and activities within Ft. Sill generate a very high or extreme wildfire probability (Directorate of Plans, Training, Mobilization, and Security 2013, 5, 8-9). Factors influencing the probability of wildfires include:

- Wind patterns and high-velocity winds,
- sources of fire fuel (including grasses, mesquite brush, and cedar),
- “man caused” risks, such as ranges, direct and indirect fire zones, use of incendiary and pyrotechnic devices, impact and training areas, and
- other natural factors, such as lightning, create conditions suitable for wildfires.

The locations of Impact Areas (IAs) and dudded and nondudded ranges are provided (Figure 1.2-2). IAs are locations where vehicle bodies are placed to act as targets for artillery direct and indirect fire. Dudded ordnance is an explosive munition which has not been armed as intended or has failed to explode once armed (US Army Alaska 2005, 1-38). Dudded areas have a high potential for UXO. Major weapons systems ranges which are semi-permanent or permanent facilities used for major weapons systems may utilize dud-producing munitions and are considered dudded IA with limited access. Non-Dudded Range Areas (NDRAs) are buffer zones between the high UXO areas and areas without UXO. A NDRA has a lower probability of UXO. Small Arms Ranges are used for small arms weapons firing and typically do not utilize potential dud-producing munitions.

This figure also identifies portions of the range by type and name. NDRA's and IA's include Quanah/Falcon Range IA, NDRA-Jones Ridge Area (JRA), West Range NDRA-North Carlton Area (NCA), West Range IA-NCA, West Range IA-JRA, NDRA-South Carlton Area (SCA), IA-SCA, IA-Scorpion Mountain Area (SMA), and NDRA-SMA.

Ft. Sill actively mitigates fire risks by firebreaks, minimization of fuel loads including deadfall and highly-combustible vegetation (agricultural leases and grounds maintenance), and fuel load reduction (prescribed burns, fire wood/timber sales, and mesquite removals) (Directorate of Plans, Training, Mobilization, and Security 2013, 24). Since 1982, Ft. Sill has engaged in prescribed burns, and since 1984, geospatially tracked wildlife to avoid adverse impacts to protected species during these burns and other activities (Directorate of Plans, Training, Mobilization, and Security 2013, 23).

Three plant species provide a high level of fire fuel and are actively managed by the Installation:

- Eastern Red Cedar (*Juniperus virginiana*) controlled with prescribed burns and mechanical methods;
- Honey Mesquite (*Prosopis glandulosa*) managed by mechanical removal combined with herbicide; and
- Johnson Grass (*Sorghum halepense*) managed through mowing (Natural Resources and Enforcement Branch, Environmental Quality Division, Directorate of Public Works n.d., 13, 21-22).

The current fire management techniques have not fully controlled wild fire risk especially fast-moving wild fires. An analysis by the Installation's Directorate of Plans, Training, Mobilization, and Security (DPTMS) concluded that the higher risks of wildfires are present in the central and eastern portions of the Installation. The analysis evaluated prevailing wind data and types of fire fuel, including trees, grasses, and leaf litter, using the best available information (Peterson 2015). The analysis identified Areas of Concern (AOC) or areas of fast-moving fire risk, North Arbuckle to Elgin and Brush Canyon to Medicine Park, and Tracer Round Risk Areas, including the Kerr Hill Machine Gun Range (KHM) and Night Infiltration Course (NIC) (Directorate of Plans, Training, Mobilization, and Security 2013, 10) (Figure 1.2-1). The presence of UXO limits fire management responses in these and other areas posing an unacceptable risk to fire and emergency personnel during wildfires as well as during mechanical removal of fire fuel. In the spring of 2013, a firefighter was injured by UXO (Sminkey, NEPA Coordinator, Fort Sill 2014). Heavy vegetation can also impede emergency response vehicles if injury occurs.

### 1.3 Scope and Content of the EA

This EA has been developed in accordance with the National Environmental Policy Act of 1969 (NEPA) (40 Code of Federal Regulations [CFR] §§ 1500-1508) and implementing regulations issued by the President's Council on Environmental Quality (CEQ) *Regulations for Implementing the Procedural Provisions of NEPA* (43 Federal Register [FR] 55990) and the *Army Regulation Environmental Analysis of Army Actions* (AR-200-2; 32 CFR 651, et. seq.) (Department of the Army 2011, 307-373, National Environmental Policy Act of 1969, as amended 1970, 1-9, Council on Environmental Quality 1978, 1-51).

The purpose of the EA is to inform decision makers of the likely potential consequences of implementation of the proposed action and alternatives (Chapter 2). The EA identifies, documents, and evaluates the environmental effects of fire mitigation on the human and natural environment at Ft. Sill. The alternatives and evaluation of environmental effects have been summarized in compliance with the requirements of the U.S. Army Environmental Center (USAEC) guidance (U.S. Army Environmental Center 2004, 1-1 to B-6, U.S. Army Environmental Command 2004, 1-1 to D-11).

An interdisciplinary team of cultural resource specialists, ecologists, engineers, planners, and scientists has analyzed the proposed action and alternatives in light of existing conditions and has identified relevant beneficial and adverse effects associated with the action. This EA is organized to reflect these required topics:

- Affected environment; conditions as of 2015 or the most recent available data are considered to be the “baseline” conditions and are summarized by resource (Chapter 3);
- Environmental effects of the proposed action and are summarized by resource as well as required permits and authorizations (Chapter 4);
- Public involvement efforts (Chapter 5);
- List of preparers (Chapter 6);
- References (Chapter 7);
- Figures (Chapter 8); and
- Tables (Chapter 9).

Each of the environmental impact categories identified in the USAEC’s *Guide to Environmental Impact Analysis* is addressed in this EA; however, detailed discussions of the affected environment and environmental effects will only be provided where a significant impact may occur or uncertainties require evaluation. Supporting documents are incorporated primarily by reference with the exception of agency letters and technical analysis that are included in the text or appendices. Chapter 4 also includes a discussion of cumulative impacts, and where appropriate, identifies mitigation measures including Best Management Practices (BMPs).

#### **1.4 Decisions to Be Made**

The Draft EA will be used to evaluate environmental consequences or effects, select a preferred alternative, and determine if a Finding of No Significant Impact (FNSI) is appropriate. A Draft EA will be available for public comment for 30 days, and a Notice of Availability (NOA) will be published in the local newspaper, the *Lawton Constitution*. If appropriate, the FNSI will document the decision to implement the proposed action and the preferred alternative, its effects, and any regulatory requirements or required mitigation. If appropriate and approved, the FNSI will be signed no earlier than 30 days from the publication of the NOA of the Final EA/Draft FNSI in the *Lawton Constitution*.

## 1.5 Public Involvement

Executive Order (EO) 12372, *Intergovernmental Review of Federal Programs*, requires intergovernmental notifications prior to making any detailed statement of environmental consequences. Through the process of Interagency and Intergovernmental Coordination for Environmental Planning, the proponent must notify concerned federal, state, and local agencies and allow them sufficient time to evaluate potential environmental consequences of a proposed action. Comments from these agencies are subsequently incorporated into the environmental analysis.

The Installation is the proponent of this fire mitigation proposal and is the lead agency for the preparation of this EA.

The U.S. Army will encourage and invite public/agency, tribal, and other participation in the NEPA process. Consideration of the views and information of all interested persons promotes open communication and enables better decision making. All agencies, organizations, and members of the public having a potential interest in the proposed action, including minority, low-income, disadvantaged, and Native American groups, will be encouraged to participate in the decision-making process during the 30-day draft EA public review period.

Public participation opportunities with respect to this EA and decision making on the proposed action are guided by 32 CFR Part 651 or AR-200-2 Subpart G. The Draft EA will be made available to the public and others at local libraries for 30 days. The Public Involvement Process is further described in Chapter 5.

## CHAPTER 2 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES (DOPAA)

### 2.1 Proposed Action

Ft. Sill proposes to implement fire mitigation measures to prevent and control fast-moving fires while also allowing Ft. Sill to minimize and prevent possible injuries or deaths of firefighting personnel due to UXO. For the purposes of this EA, these alternatives are evaluated for the anticipated implementation period of 10 years.

### 2.2 Alternatives Considered

Ft. Sill evaluated a combination of fire hazard mitigation techniques including fire fuel minimization and removal, use of targeted and aerial spraying of herbicides to reduce fire fuel, and firebreaks to identify the following alternatives for further study.

#### 2.2.1 No Action Alternative

Ft. Sill will continue implementing existing fire hazard mitigation, including the following:

- Control species providing significant fire fuel by: prescribed burns and mechanical methods for the invasive Eastern Red Cedar; mechanical removal combined with herbicide for Honey Mesquite; and mowing for Johnson Grass; where feasible (Natural Resources and Enforcement Branch, Environmental Quality Division, Directorate of Public Works n.d., 13, 21-22) (Figure 2.2-1);
- Apply approved herbicides to control noxious weeds in compliance with federal and state laws and internal BMPs (Directorate of Public Works, Fort Sill Garrison n.d., 8-88);
- Out lease agricultural lands up to 5,000 acres for hay production, which reduces fire fuel (Natural Resources and Enforcement Branch, Environmental Quality Division, Directorate of Public Works n.d., 2) (Figure 2.2-1);
- Continue to remove woody vegetation, including canopy, for 30 feet (ft) on either side of roadways and fence lines with the exception of old growth areas where deadfall and underbrush would be removed instead;
- Use aerial spraying to control Honey Mesquite (illustrated as Mesquite Savanna in Figure 2.2-1) (Deurmyer 2015); and
- Maintain existing firebreaks including a 30 ft buffer in the same manner as roadway and fence line maintenance (Figure 2.2-1).

Figure 2.2-1 illustrates areas that have been or are under consideration for prescribed burning that may be conducted annually, every 2 years, or as mitigation during wildfire events (Peterson 2015). The out lease agricultural areas include all areas that may be leased.

Chemical treatments, such as herbicide applications with approval safeguards, will be utilized to control fuel fire but must be approved by Ft. Sill Environmental Quality Division (EQD) and DPW Pest Management. Furthermore, disturbance of threatened and endangered species during nesting and other sensitive periods is prohibited. Contractors are responsible for threatened and

endangered species surveys prior to work within potential habitat and must comply with air quality regulations and applicable fire-related codes and standards. Furthermore, the Contractor must be licensed by the State of Oklahoma or Department of Army and a license provided to the Installation Pest Management Coordinator (IPMC) (Sminkey, NEPA Coordinator, Fort Sill 2015).

When trees are mechanically removed, the stump will remain, and a combination of native grasses and other species will be used to restore the area (Fort Sill, OK 2010, 1-66). Restoration areas will follow the procedures established in the Integrated Training Area Management (ITAM) *Five-Year Work Plan, Fiscal Years 2009-2013*.

### **2.2.2 Proposed Action Alternative**

The Proposed Action Alternative (herein Proposed Action) is the only action alternative that will be carried forward for further analysis. In addition to the programs identified in the No Action Alternative (including general maintenance of roads and fence lines), Ft. Sill or its Contractors will:

- Construct six (6) new, interior firebreaks (Figures 2.2-2 to 2.2-5);
- Remove woody vegetation from 15 ft on either side of specific roadways (Figure 2.2-6); and
- Where mechanical removal or ground-level spraying is impracticable due to UXO and severe undergrowth, programmatically evaluate and implement aerial spraying of noxious weeds and other fuel sources to reduce fuel for wildfires.

This includes firebreaks within the West Range (FBWR) and East Range (FBER). Alternative 1 includes FBER56, FBER66, FBER68, FBWR51, FBWR56, and FBWR58. Three of the proposed firebreaks are located in the East Range – Firebreaks East Range (FBER) 56, 66, and 68; and three are located on the West Range – FBWR 51, 56, and 58. The firebreak locations were selected to avoid sensitive features, such as wetlands, streams, and protected habitat, but also establish connected firebreaks with existing firebreaks and provide further control of fast-moving fires based upon the wildlife fire probability analysis.

Where practical and environmental conditions permit, the firebreaks will be constructed by clearing all vegetation in a corridor with a total 40 foot (ft) width (20 ft on either side of centerline). Stream crossings, resulting from the construction, will be restored to pre-existing contours. If Black-Capped Vireo (*Vireo atricapilla*, BCVI) habitat is identified by ecological surveys or perennial streams are present, the firebreak will be constrained to avoid impacts to BCVI or other protected habitat and minimize adverse effects on streams, including increased erosion and adverse effects on water quality associated removal of riparian vegetation (Sminkey, NEPA Coordinator, Fort Sill 2014). Firebreaks will be constructed and regularly maintained by Contractors. This work will be coordinated with the Ft. Sill Fire Department, Range Control, and Directorate of Public Works (DPW) in compliance with the Firebreak/Fuel Removal Standard Operating Procedure (SOP) and Maintenance SOP. Contractors will inspect, maintain, and repair all firebreaks in agreement with (IAW) Task Element (TE) 5.7-002, while maintaining the drainage between April and November, or as instructed by the Contracting Officer (KO) or Contracting Officer's Representative (COR) (Hill 2014).

The Woody Vegetation Removal Areas (WVRA) were selected using similar criteria and consists of approximately 430 acres. More detailed maps of the Woody Vegetation Removal Areas are provided (Appendix A). A combination of heavy and light equipment will be used to establish and maintain the WVRA.

All firebreak construction and woody vegetation removal shall be performed by qualified personnel and comply with applicable laws and Installation guidelines. The Contractor will develop and implement a fuel removal plan that will include but will not be limited to underbrush clearing and/or tree thinning, slash removal, vertical removal of tree branches, and down trees. Mechanical treatments, such as mulching, grinding, mowing, chopping, and removal of such materials shall meet appropriate practices. Manual treatments, such as thinning of vegetation with chainsaws and hand tools, will be used in areas with high levels of fuel and cultural resources and/or other resources that would be adversely affected by prescribed burns or wildlands fire.

The ongoing programs as described under the No Action Alternative (Section 2.2.1) would also continue under the Proposed Action.

Aerial spraying will target areas with high concentrations of Johnson Grass and Honey Mesquite with limited access throughout the Installation, but especially in areas with potential for fast-moving wildfires (Figure 1.2-1) (Deurmyer 2015). Each aerial application will be reviewed and approved by the Ft. Sill EQD, the Ft. Sill Pest Management Office (PMO), and the USAEC entomologist and documented using the Department of Defense (DD) Form 1532-1. No off-label uses of herbicides (grouped under pesticides by the DoD) will be allowed, and the application will comply with federal, state, and local standards, including local standards for Honey Mesquite Control.

To obtain approval of aerial spraying, requestors will prepare an Aerial Spray Statement of Need (ASSON) and submit it for review and consideration in compliance with the *Final Programmatic Environmental Assessment (PEA) for the Implementation of U.S. Army Integrated Pest Management Program* (Pest Management Program 2010, 6-7). This PEA and *AR 200-1 Environmental Protection and Enhancement* allow aerial application of chemicals to control overgrowth in ranges where UXO prevent normal Integrated Pest Management (IPM) practices, but both require an ASSON within an installations' Integrated Pest Management Plan (IPMP) (Headquarters, Department of the Army 2007).

### **2.3 Alternatives Eliminated from Further Consideration**

Alternatives for proposed firebreaks were initially selected to address the potential for fast-moving fires and evaluated to minimize the risk of wild fires or exacerbating conditions causing wild fires. Ft. Sill eliminated some proposed firebreaks during the screening analysis to avoid endangered species habitat, wetlands, and perennial streams; minimize safety risks; and prevent access restrictions, such as the City of Lawton's fenced wastewater treatment plant property. Ft. Sill realigned one firebreak alternative to use a waterline easement rather than constructing a new easement on undisturbed land. Ft. Sill also evaluated removal of deadfall in Training Area 39 but later determined that removal of deadfall and vegetation along Deer Creek Canyon Road and the nearby proposed firebreak would be more effective and eliminated removal of deadfall in

Training Area 39 from further consideration. The removal of Deer Creek Canyon Road will be accomplished under a separate Installation program and is further described in Section 4.20 Cumulative Effects.

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Sminkey, Sarah, interview by Lara Zuzak. *NEPA Coordinator, Fort Sill* (March 17, 2015).

Sminkey, Sarah, interview by Lara Zuzak. *NEPA Coordinator, Fort Sill* (November 12, 2014).

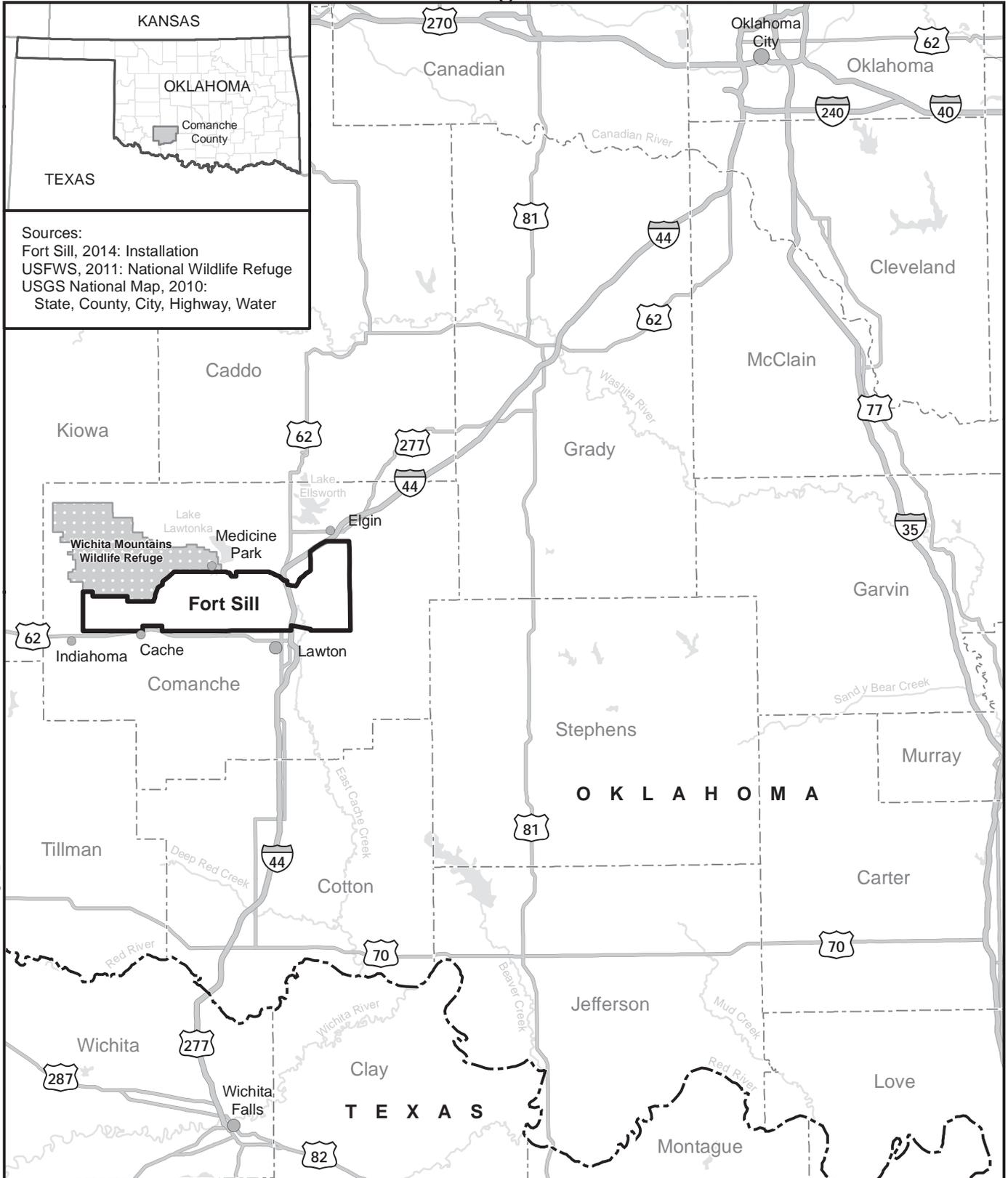
U.S. Army Environmental Center. *Guide to Development of the Description of Proposed Action and Alternatives (DOPAA)*. Aberdeen Proving Ground, Maryland: U.S. Army Environmental Center, 2004, 1-1 to B-6.

U.S. Army Environmental Command. *Guide to Environmental Impact Analysis*. Aberdeen Proving Ground, Maryland: U.S. Army Environmental Command, 2004, 1-1 to D-11.

US Army Alaska. *Integrated Training Area Management (ITAM) Five-Year Plan Fiscal Years 2006-2010*. US Army Alaska, 2005, Appendix B: 1-38.

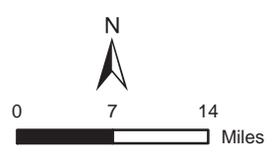
**CHAPTER 8 FIGURES**

# Fire Mitigation



Sources:  
 Fort Sill, 2014: Installation  
 USFWS, 2011: National Wildlife Refuge  
 USGS National Map, 2010:  
 State, County, City, Highway, Water

File: L:\AGE\Projects\ENV\USACE\OA\_Systems\W912B-10-D-2013\TO\_0003 - Ft. Sill LF Eval\GIS\MXD\Firebreaks\Fig11\_Location.mxd



**Legend**

- Fort Sill Installation Area
- National Wildlife Refuge
- State Boundary
- County Boundary
- City
- Highway
- Major River

**Location of Fort Sill**

FIRE MITIGATION ENVIRONMENTAL ASSESSMENT

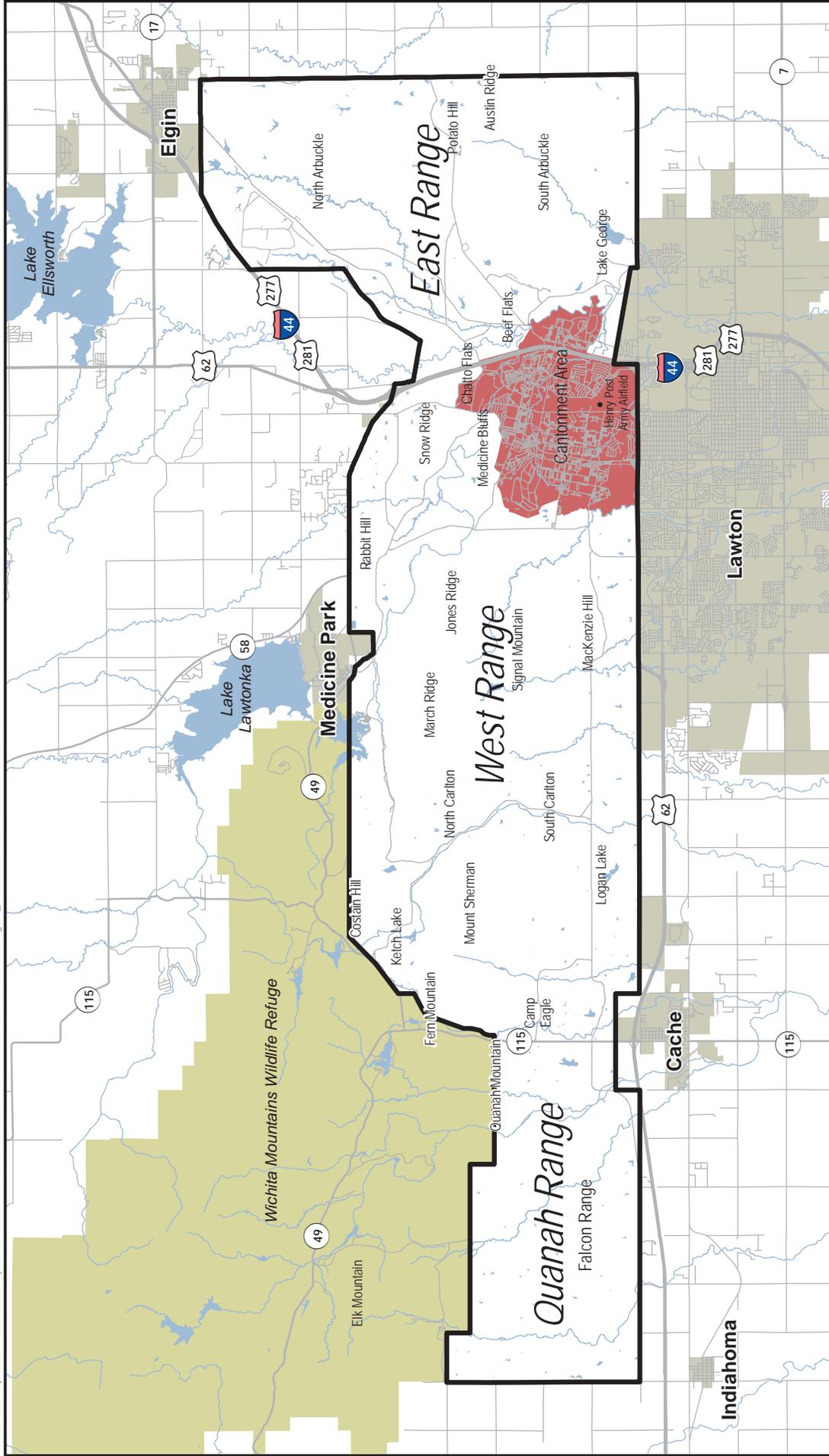
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# Fire Mitigation

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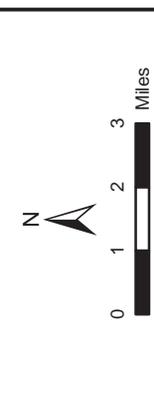
### Legend

-  Fort Sill Installation Area
-  Cantonment Area
-  City/Town
-  National Wildlife Refuge
-  Road
-  Water

Sources:  
 Fort Sill, 2014: Cantonment, Installation, Ranges, Roads, Water  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

## Installation Ranges and Cantonment Area FIRE MITIGATION ENVIRONMENTAL ASSESSMENT

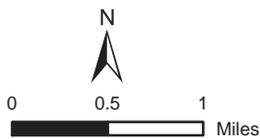
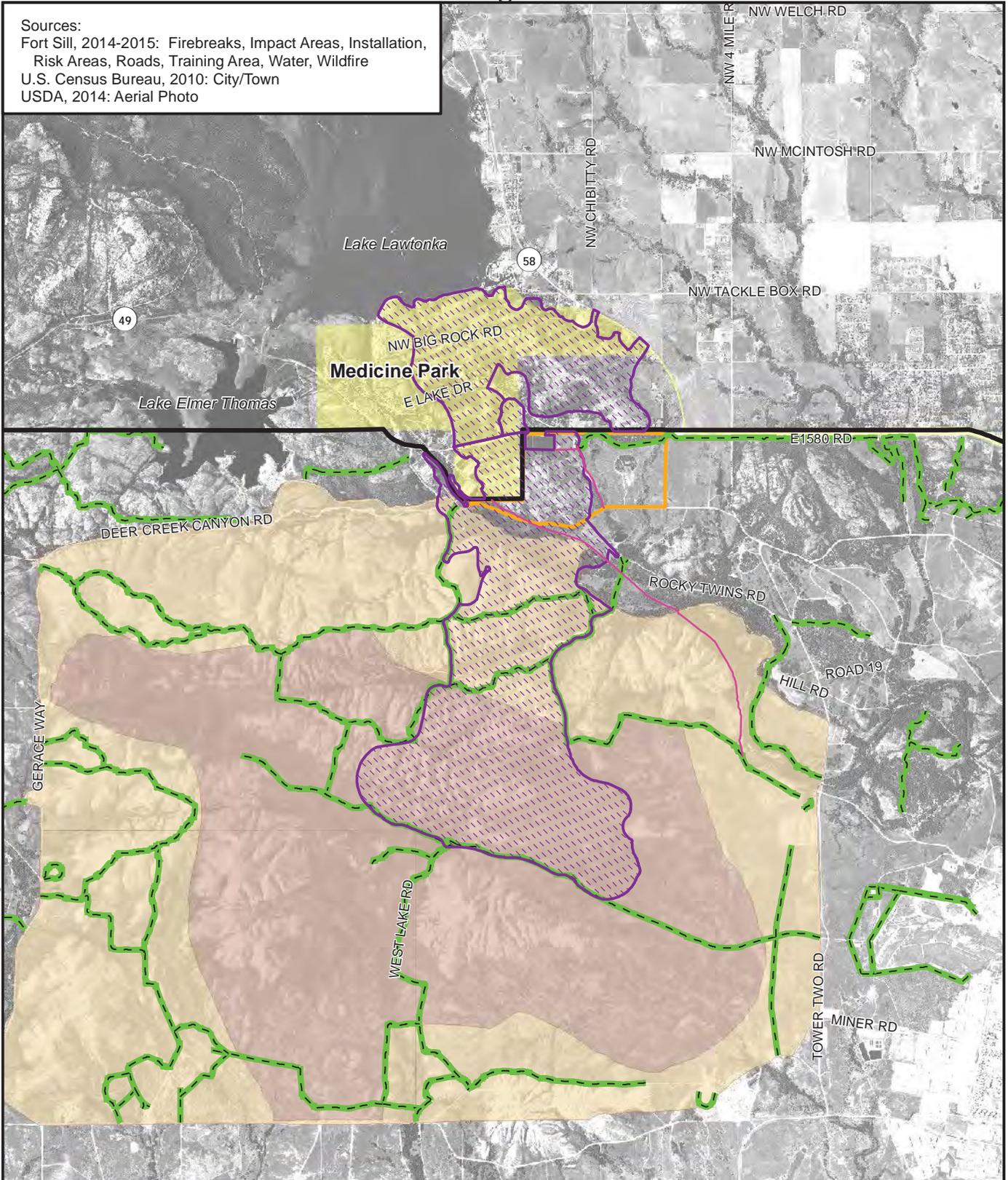
Date: 4/7/2015 Figure 1.1-2



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# Fire Mitigation

Sources:  
 Fort Sill, 2014-2015: Firebreaks, Impact Areas, Installation, Risk Areas, Roads, Training Area, Water, Wildfire  
 U.S. Census Bureau, 2010: City/Town  
 USDA, 2014: Aerial Photo



### Legend

- Approximate Extent of Medicine Park Wildfire (June 2011)
- Impact Area Dudded
- Impact Area Non-Dudded
- Existing Firebreak
- City/Town
- Training Area 39
- Impact Area Dudded
- Impact Area Non-Dudded
- Fort Sill Installation Area

## Approximate Extent of Medicine Park Wildfire (June 2011)

FIRE MITIGATION ENVIRONMENTAL ASSESSMENT

Date: 4/8/2015

Figure 1.2-1



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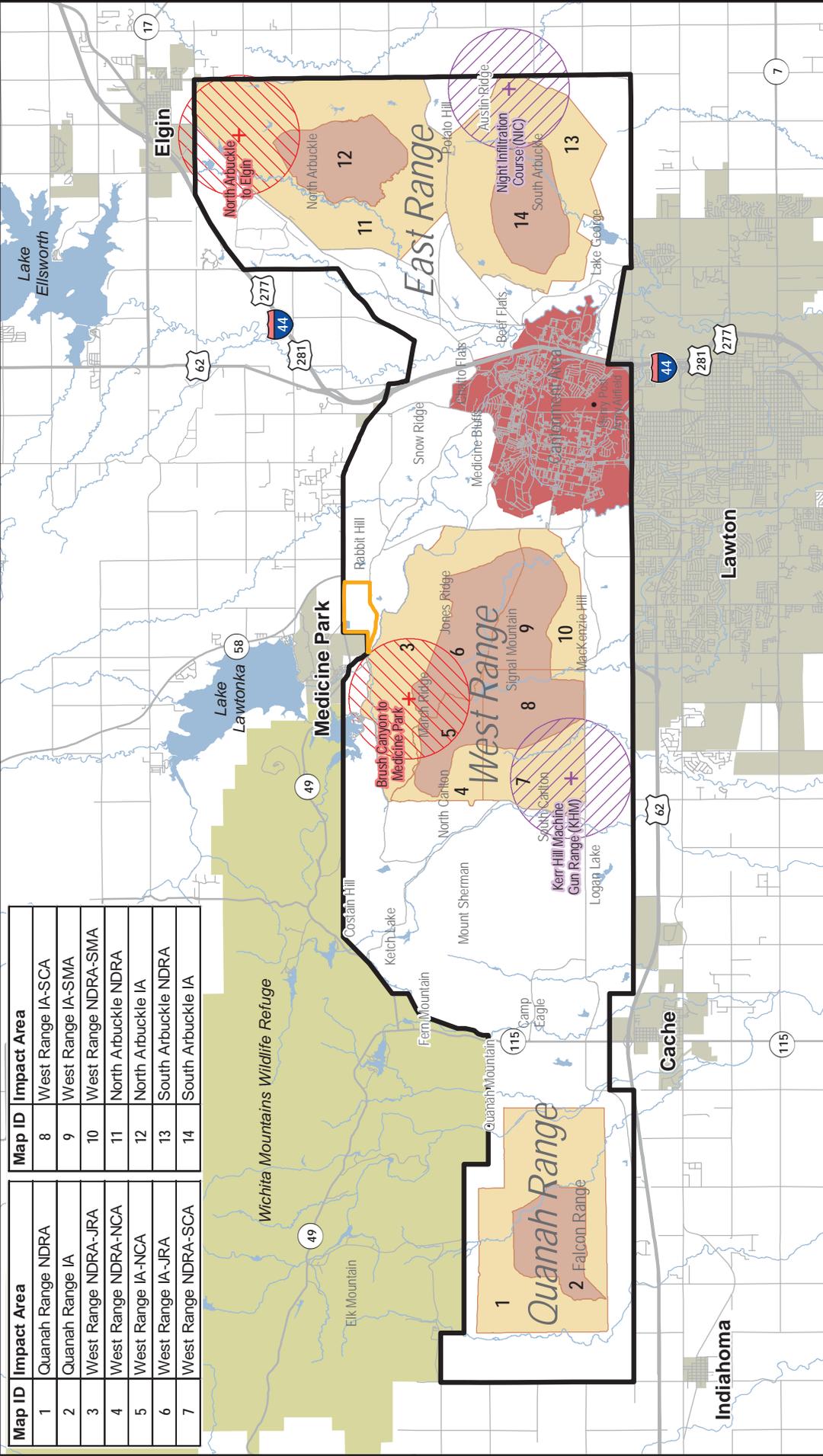
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# Fire Mitigation

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Map ID	Impact Area	Map ID	Impact Area
1	Quanah Range NDRA	8	West Range IA-SCA
2	Quanah Range IA	9	West Range IA-SMA
3	West Range NDRA-JRA	10	West Range NDRA-SMA
4	West Range NDRA-NCA	11	North Arbuckle NDRA
5	West Range IA-NCA	12	North Arbuckle IA
6	West Range IA-JRA	13	South Arbuckle NDRA
7	West Range NDRA-SCA	14	South Arbuckle IA



0 1 2 3 Miles

North Arrow

**Legend**

- Fort Sill Installation Area
- City/Town
- National Wildlife Refuge
- Cantonment Area
- Road
- Water
- Training Area 39
- Impact Area Dudded
- Impact Area Non-Dudded
- Fast Moving Fire Risk Area
- Tracer Round Risk Area

**Sources:**  
 Fort Sill, 2014-2015:  
 Cantonment, Impact Areas,  
 Installation, Ranges, Risk  
 Areas, Roads, Water  
 U.S. Census Bureau, 2010:  
 City/Town  
 USFWS, 2011: National Wildlife  
 Refuge

**Areas of Concern**

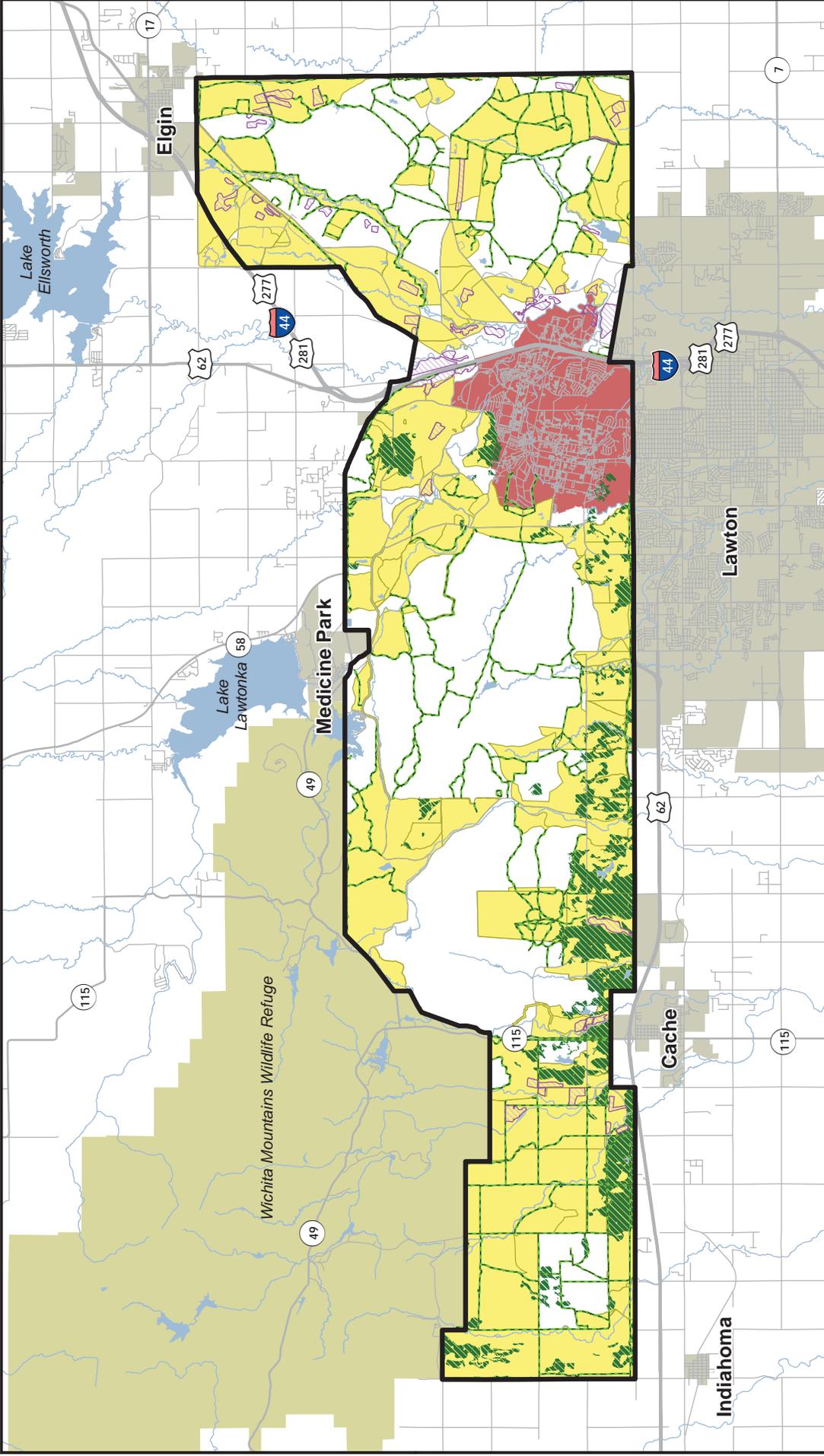
FIRE MITIGATION  
 ENVIRONMENTAL ASSESSMENT

Date: 4/7/2015      Figure 1.2-2



# Fire Mitigation

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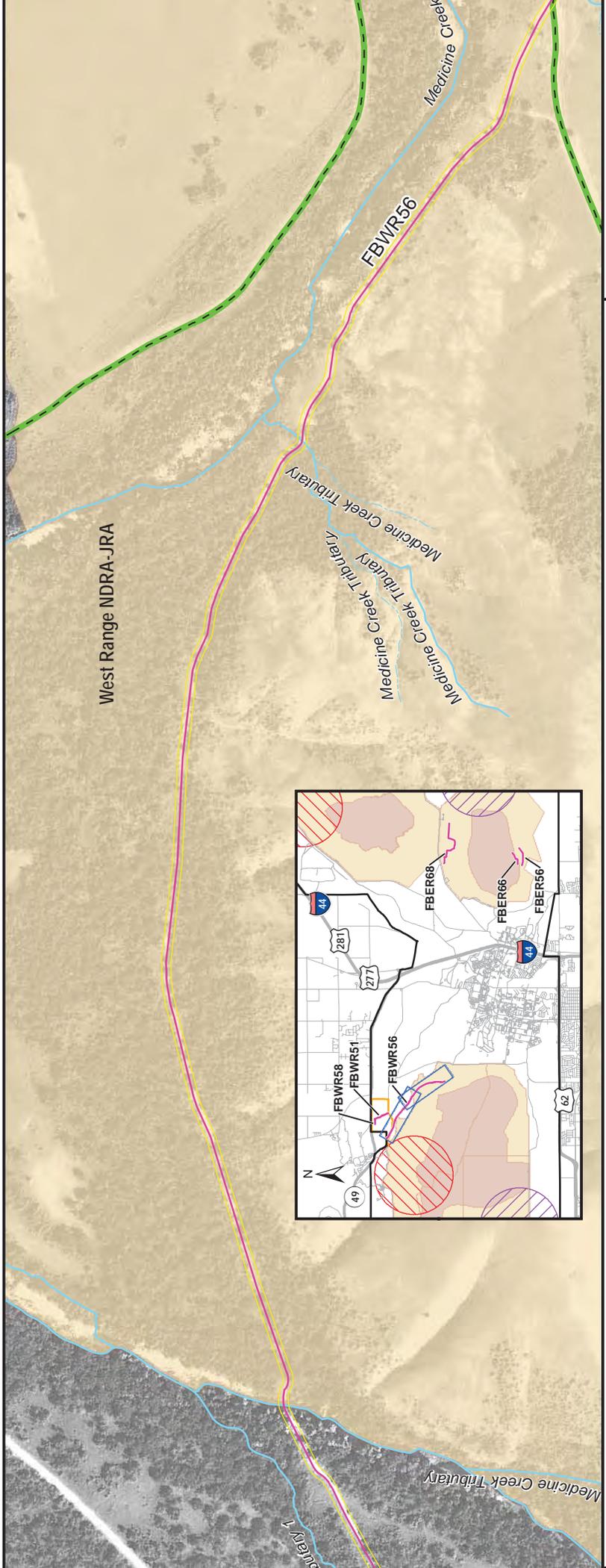


- Legend**
- Fort Sill Installation Area
  - City/Town
  - National Wildlife Refuge
  - Cantonment Area
  - Road
  - Water
  - Mesquite savanna (MS)
  - Existing Firebreak
  - Agricultural Lease
  - Potential Prescribed Burn Area

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**Sources:**  
 Fort Sill, 12/2014: Installation, Roads, Water, Cantonment, Impact Areas, Risk Areas  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

**No Action Alternative**  
 FIRE MITIGATION ENVIRONMENTAL ASSESSMENT  
 Date: 4/14/2015 Figure 2.2-1



Sources:

Fort Sill, 2014-2015: Firebreaks, Impact Areas, Installation, Risk Areas, Roads, Training Area, Water  
 URS, 2015: Firebreak Buffer

Legend

-  Proposed Firebreak
-  Firebreak Buffer (40-foot corridor)
-  Existing Firebreak
-  Fast Moving Fire Risk Area
-  Tracer Round Risk Area
-  Stream, Intermittent

# Fire Mitigation

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**Legend**

- Proposed Firebreak
- Firebreak Buffer (40-foot corridor)
- Existing Firebreak
- Training Area 39
- Impact Area Dudded
- Impact Area Non-Dudded
- Fast Moving Fire Risk Area
- Tracer Round Risk Area
- Stream, Intermittent
- Stream, Permanent
- Fort Sill Installation Area

**Sources:**  
 Fort Sill, 2014-2015: Firebreaks, Impact Areas, Installation, Risk Areas, Roads, Training Area, Water  
 URS, 2015: Firebreak Buffer  
 USDA, 2014: Aerial Photo

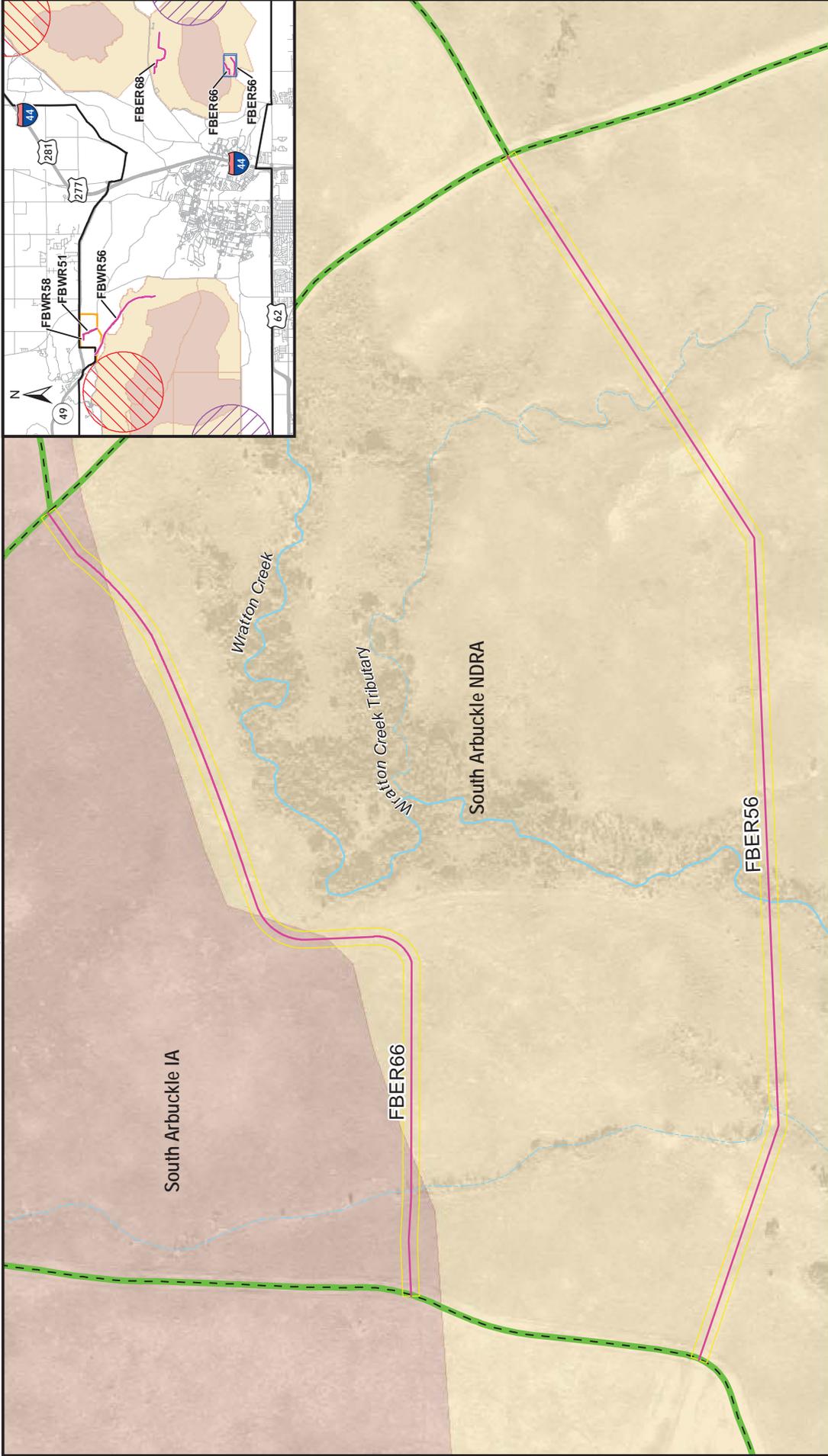
**Proposed Action:**  
**Proposed Firebreak FBER68**  
 FIRE MITIGATION ENVIRONMENTAL ASSESSMENT

Date: 7/27/2015 Figure 2.2-3

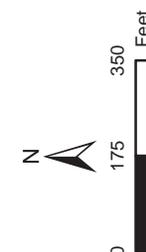
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# Fire Mitigation

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- Legend**
- Proposed Firebreak
  - Firebreak Buffer (40-foot corridor)
  - Existing Firebreak
  - Training Area 39
  - Impact Area Dudded
  - Impact Area Non-Dudded
  - Fast Moving Fire Risk Area
  - Tracer Round Risk Area
  - Stream, Intermittent
  - Stream, Permanent
  - Fort Sill Installation Area



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**Sources:**  
 Fort Sill, 2014-2015: Firebreaks, Impact Areas, Installation, Risk Areas, Roads, Training Area, Water  
 URS, 2015: Firebreak Buffer  
 USDA, 2014: Aerial Photo

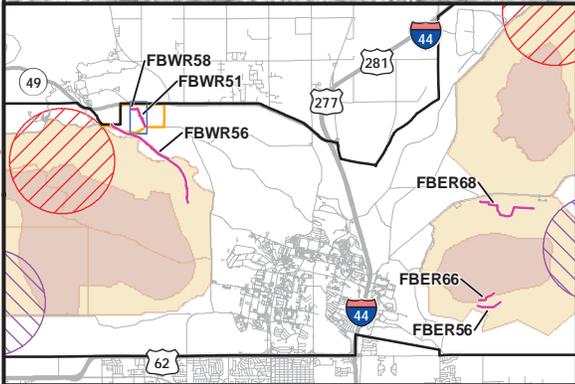
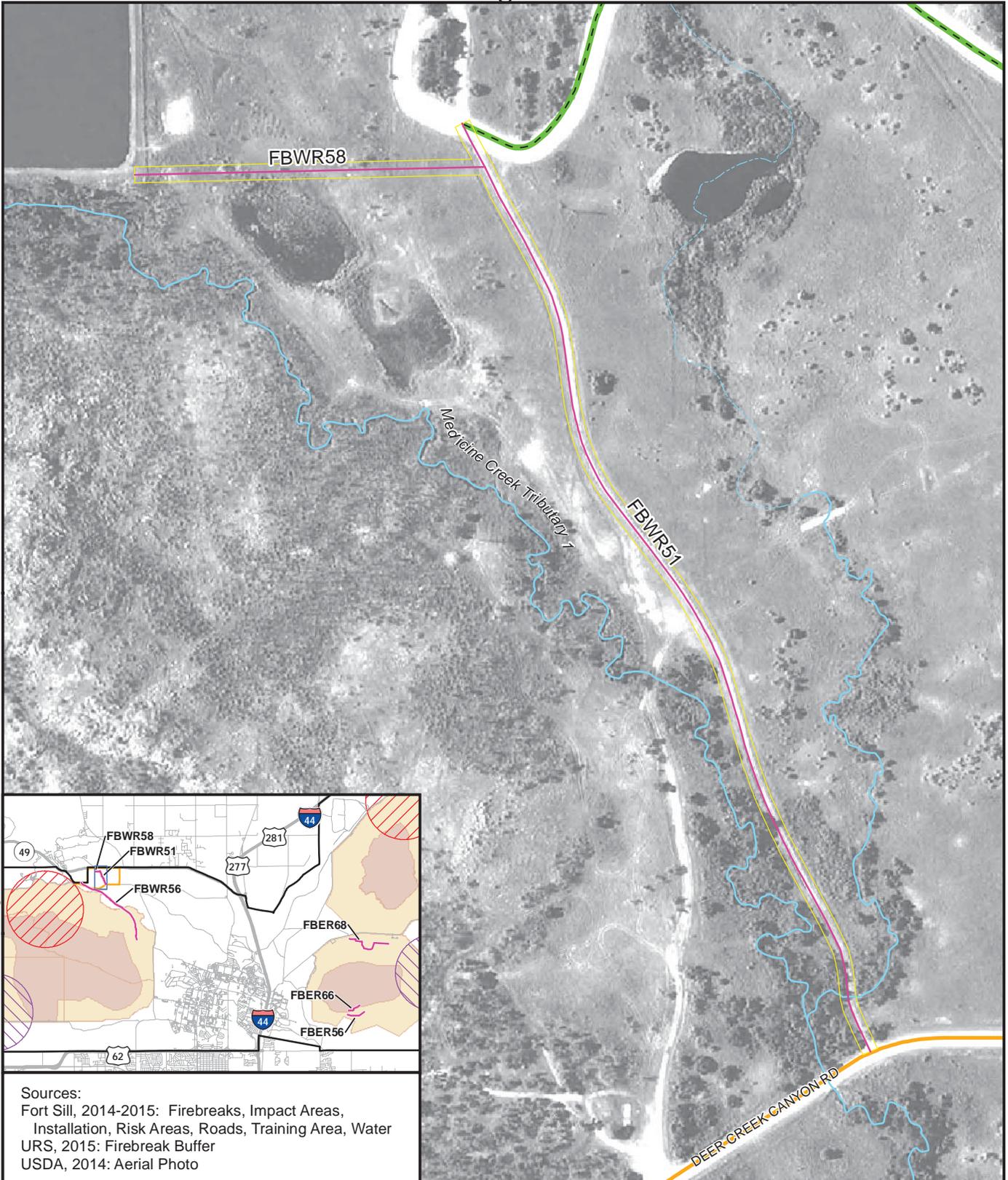
**Proposed Action:**  
**Proposed Firebreak FBER66 and FBER56**  
 FIRE MITIGATION ENVIRONMENTAL ASSESSMENT

Date: 7/27/2015

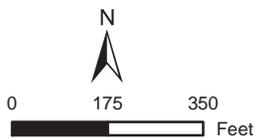
Figure 2.2-4

ENCL 3

# Fire Mitigation



Sources:  
 Fort Sill, 2014-2015: Firebreaks, Impact Areas, Installation, Risk Areas, Roads, Training Area, Water  
 URS, 2015: Firebreak Buffer  
 USDA, 2014: Aerial Photo



9400 Amberglen Blvd.  
 Austin, TX 78729  
 Phone: (512) 454-4797

www.urs.com

## Legend

- Proposed Firebreak
- Firebreak Buffer (40-foot corridor)
- Existing Firebreak
- Training Area 39
- Impact Area Dudded
- Impact Area Non-Dudded
- Fast Moving Fire Risk Area
- Tracer Round Risk Area
- Stream, Intermittent
- Stream, Permanent
- Fort Sill Installation Area

## Proposed Action: Proposed Firebreaks FBWR58 and FBWR51

FIRE MITIGATION  
 ENVIRONMENTAL ASSESSMENT

Date: 7/27/2015

Figure 2.2-5

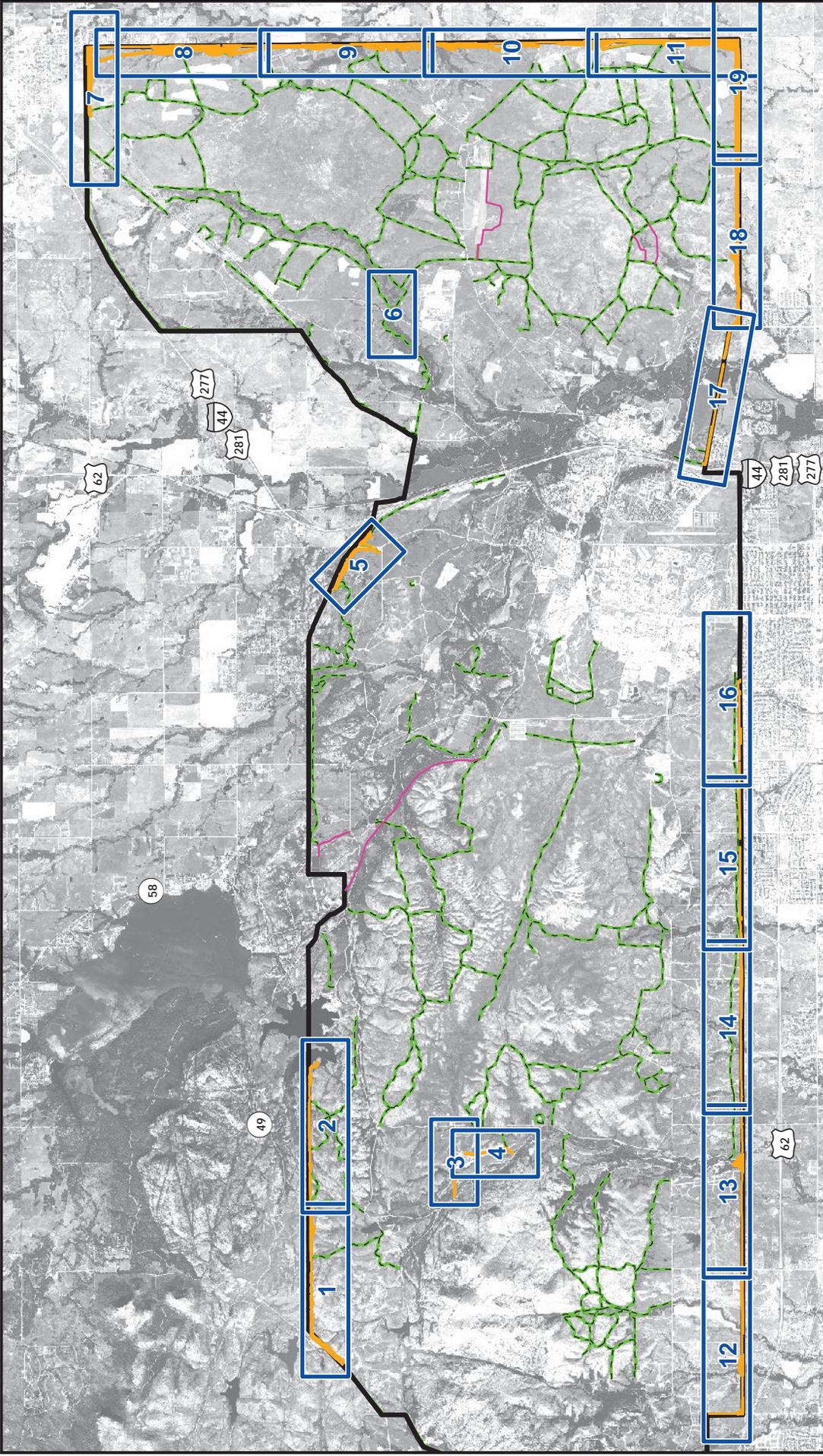
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**APPENDIX A**  
**DETAILED MAPS OF WOOD VEGETATION REMOVAL**

# Fire Mitigation

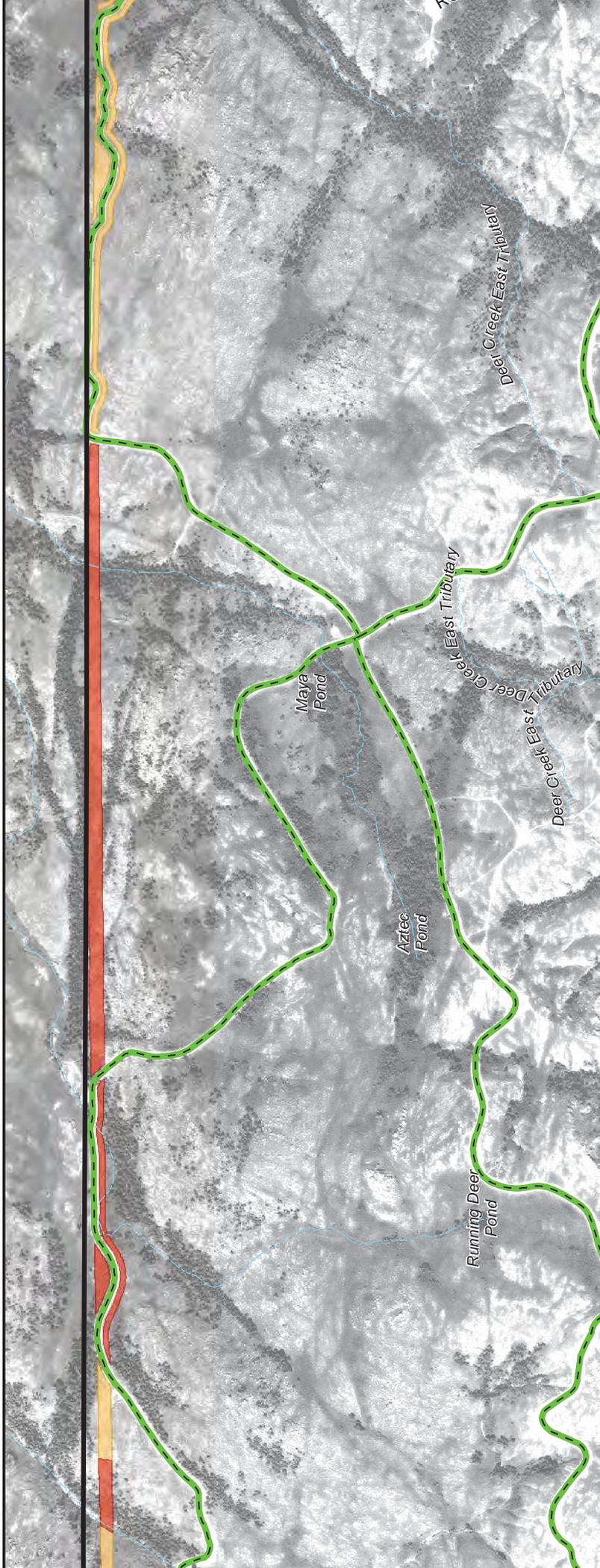
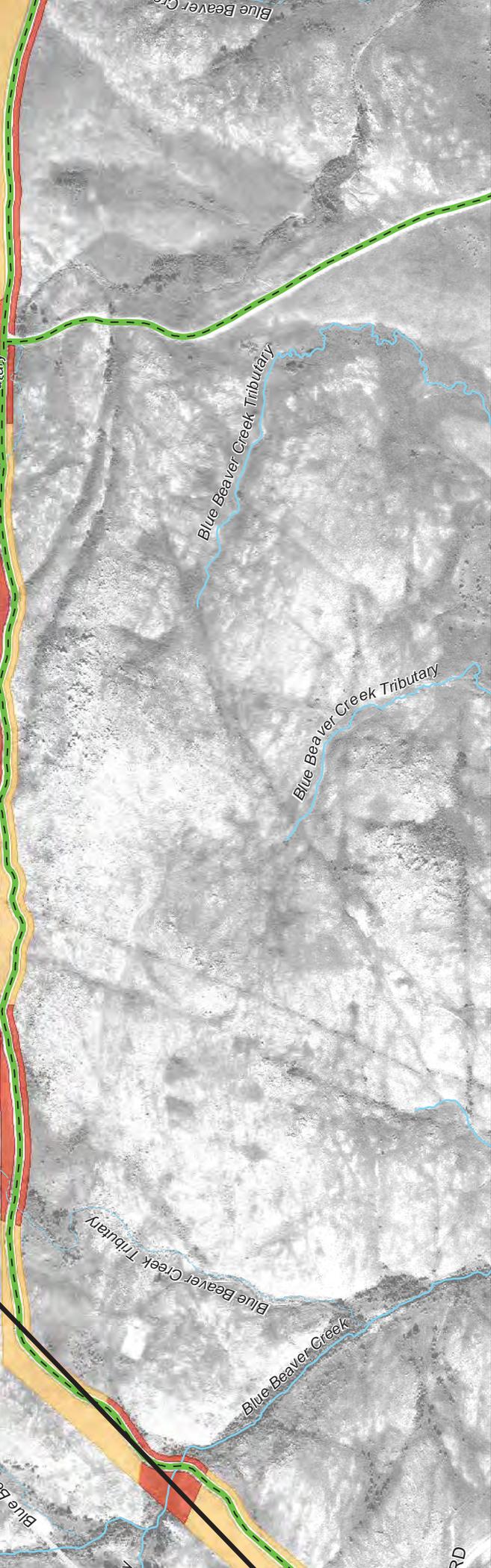
File: L:\AGE\Projects\ENVUSACE\O&A Systems\W912B-10-D-2013\TO 0003 - Ft Sill UF E\GIS\IMX\DDOPAA\FgA01\_WVRA.mxd 7/24/2015 9:40:38 AM



<p>Legend</p> <ul style="list-style-type: none"> <li><span style="border: 1px solid blue; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Map Index</li> <li><span style="border-bottom: 2px solid orange; width: 20px; display: inline-block; margin-right: 5px;"></span> Proposed Firebreak</li> <li><span style="border-bottom: 2px solid green; width: 20px; display: inline-block; margin-right: 5px;"></span> Existing Firebreak</li> <li><span style="border: 2px solid black; width: 20px; height: 10px; display: inline-block; margin-right: 5px;"></span> Fort Sill Installation Area</li> </ul>	<p>Sources:          Fort Sill, 2014-2015: Firebreaks, Installation, Woody Vegetation Removal Areas          USDA, 2014: Aerial Photo</p>	<p><b>Woody Vegetation Removal Areas Index Map</b></p> <p>FIRE MITIGATION ENVIRONMENTAL ASSESSMENT</p> <p>Date: 7/24/2015 <span style="float: right;">Figure A-1</span></p>
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 0 1 2 Miles

  
 9400 Amberglenn Blvd.  
 Austin, TX 78729  
 Phone: (512) 454-4797  
 W W U R S . C O M

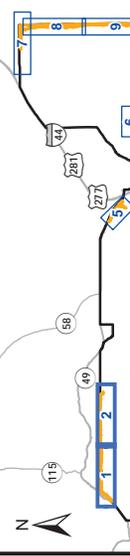


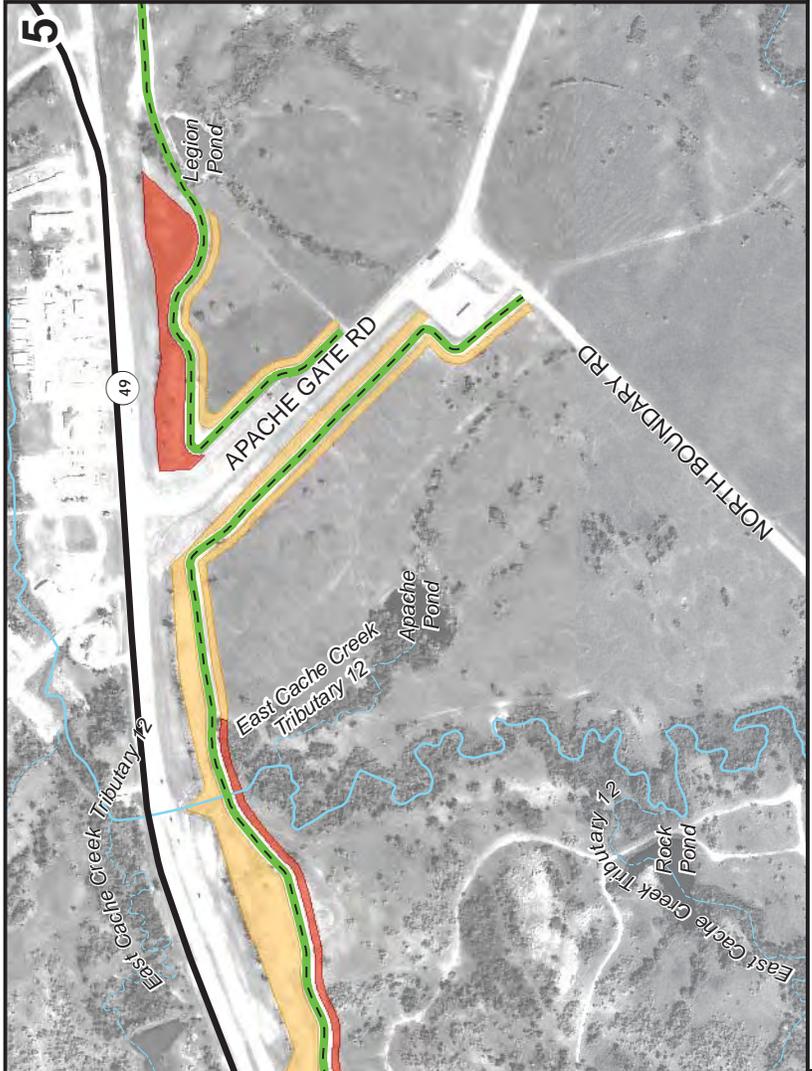
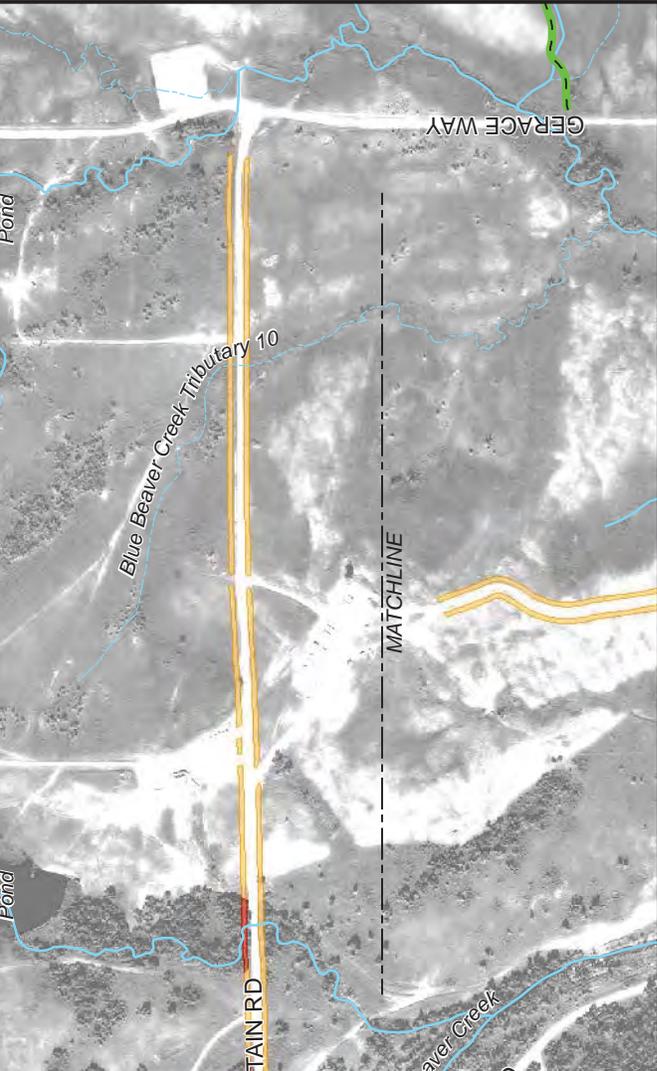
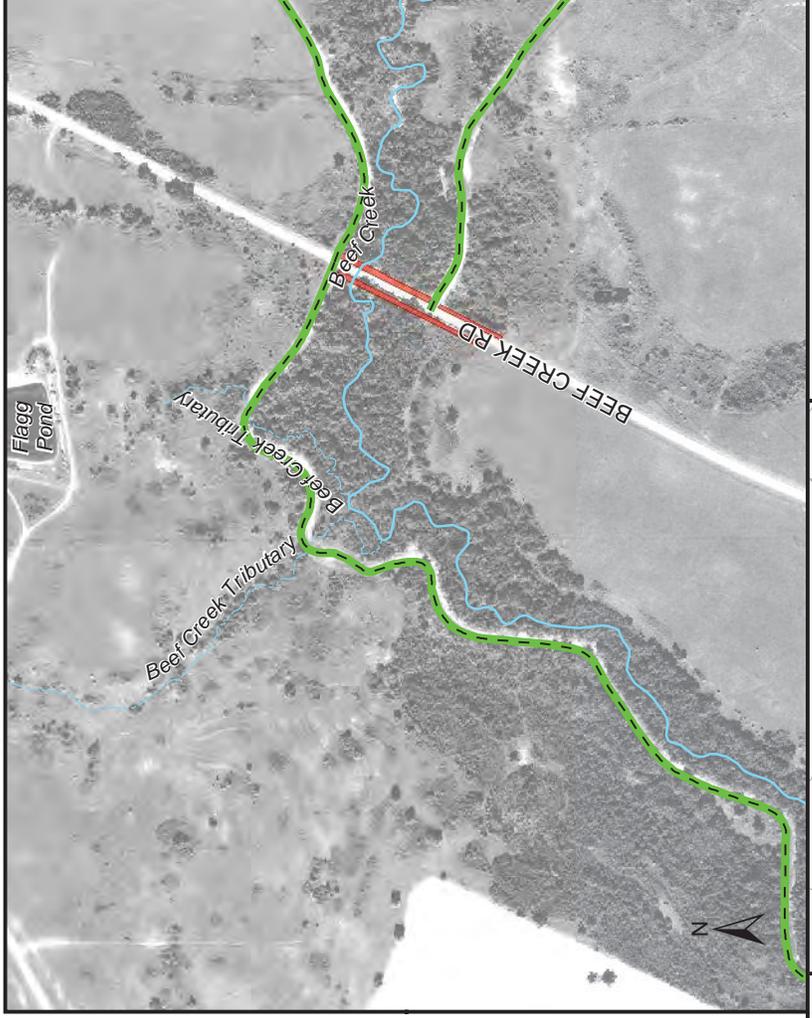
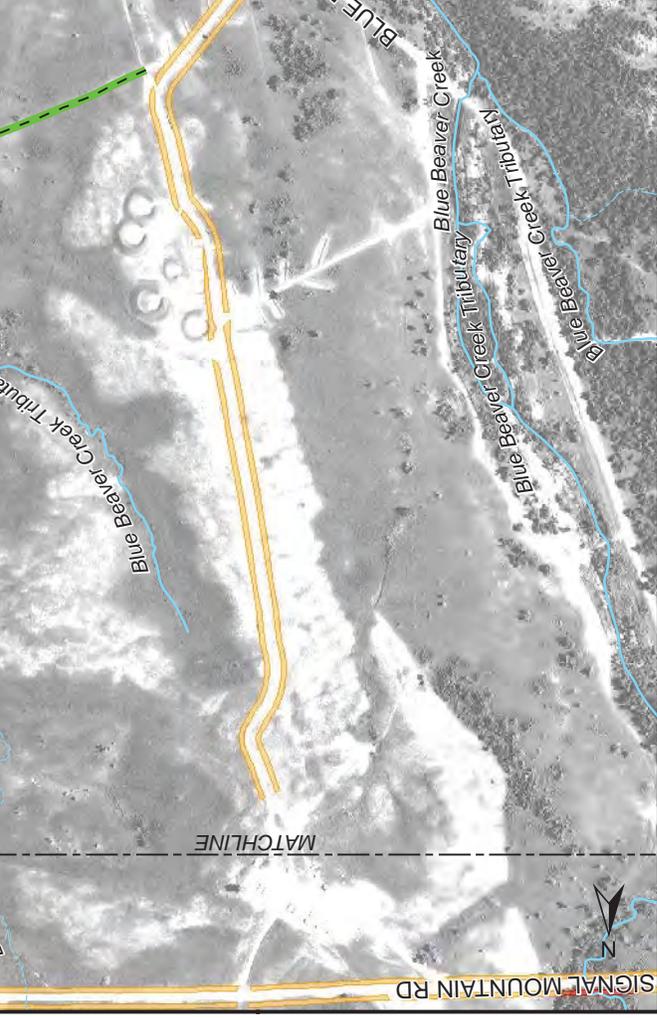
**Legend**

- Woody Vegetation Removal-Heavy Equipment Maint.
- Woody Vegetation Removal-Light Equipment Maint.
- Proposed Firebreak
- Firebreak Buffer (40-foot corridor)
- Existing Firebreak

**Sources:**

Fort Sill, 2014-2015: Firebreaks, Impact Areas, Installation, Risk Areas, Roads, Training Area, Water, Woody Vegetation Removal Areas

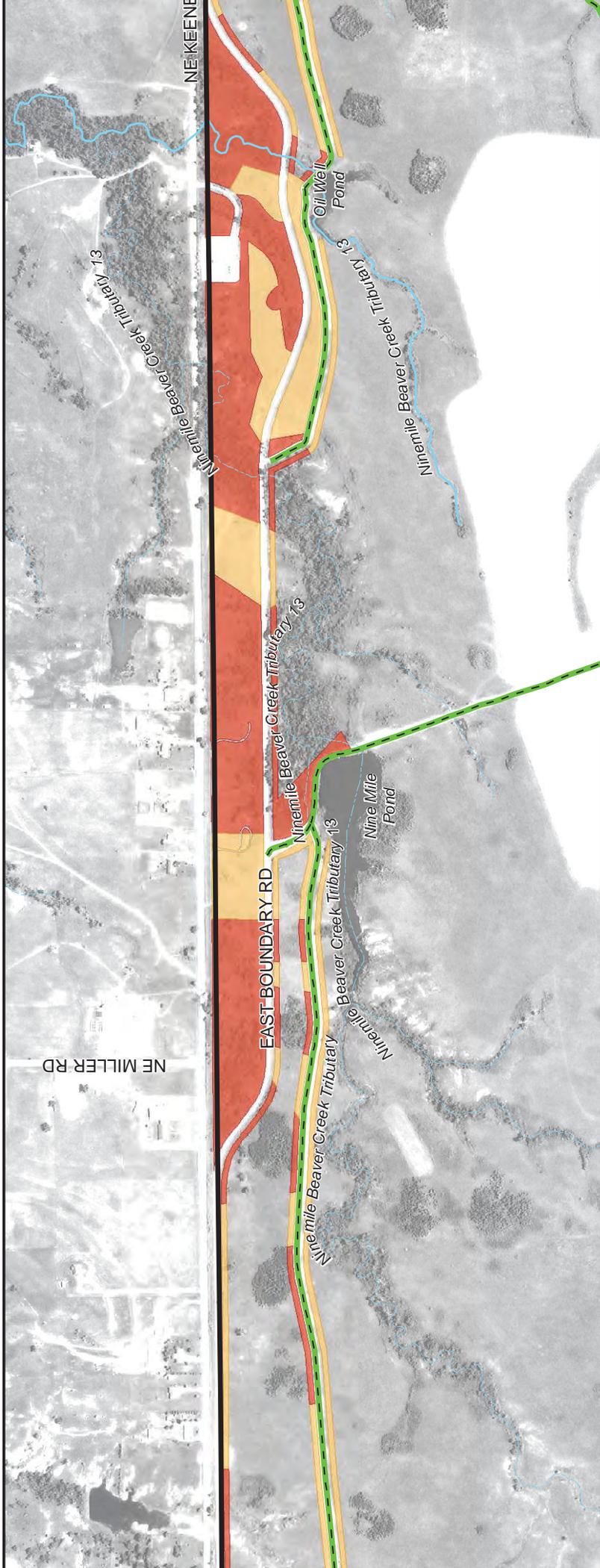




**Legend**

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- Proposed Firebreak
- Woody Vegetation Removal-Light Equipment Maint.
- Firebreak Buffer (40-foot corridor)
- Existing Firebreak

**Sources:**  
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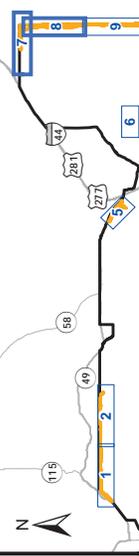


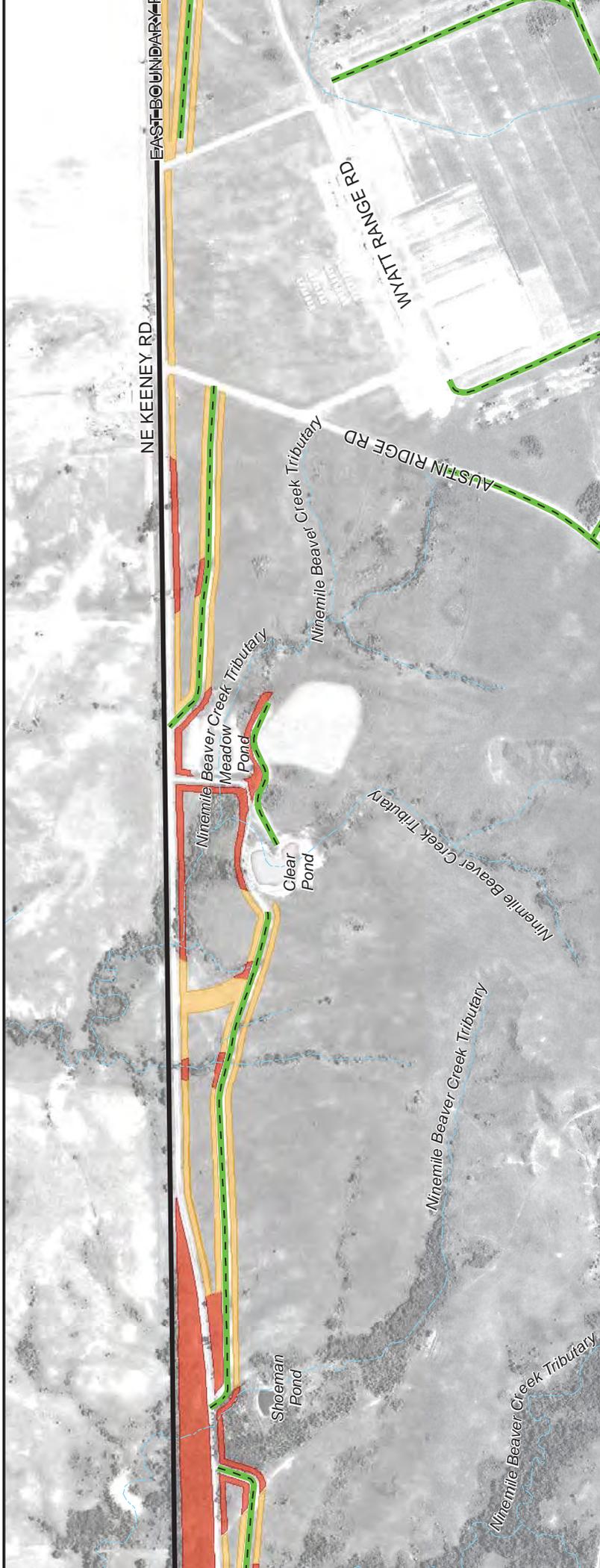
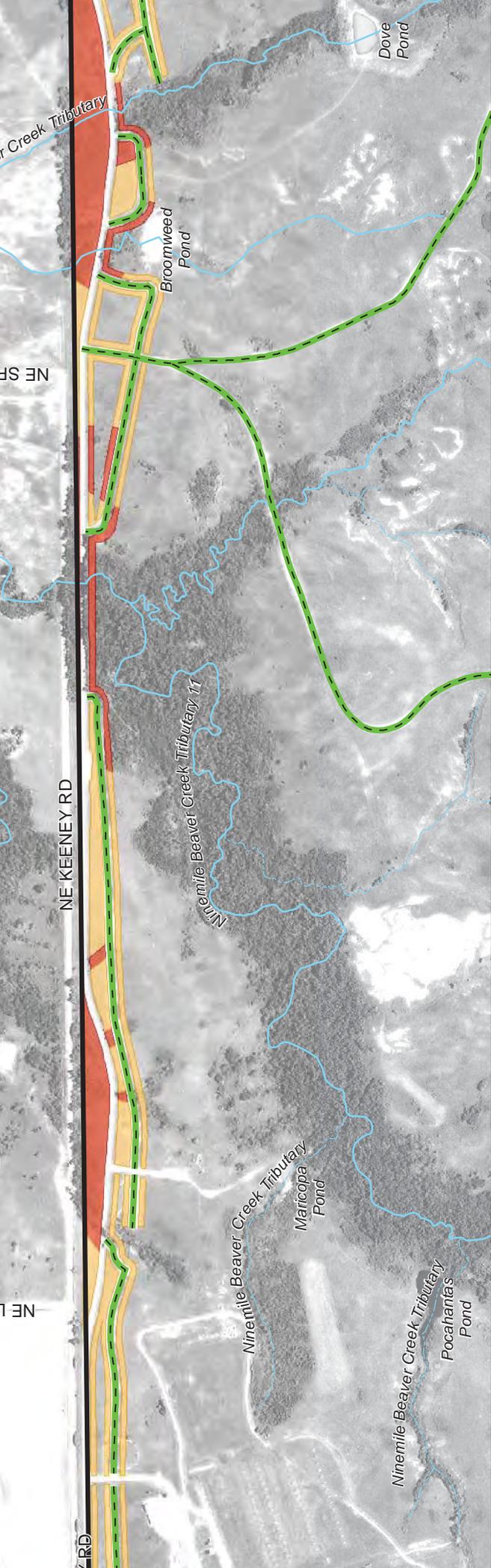
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**Sources:**

Fort Sill, 2014-2015: Firebreaks, Impact Areas, Installation, Risk Areas, Roads, Training Area, Water, Woody Vegetation Removal Areas

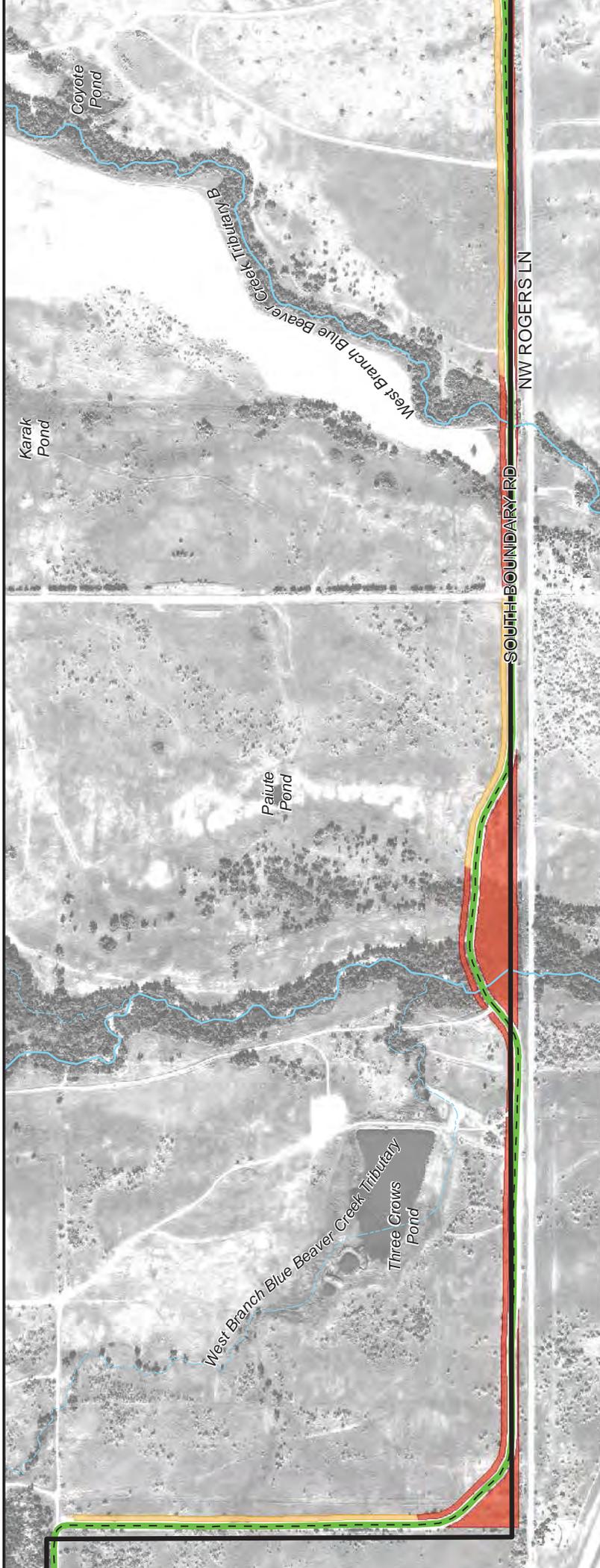




**Legend**

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- Existing Firebreak

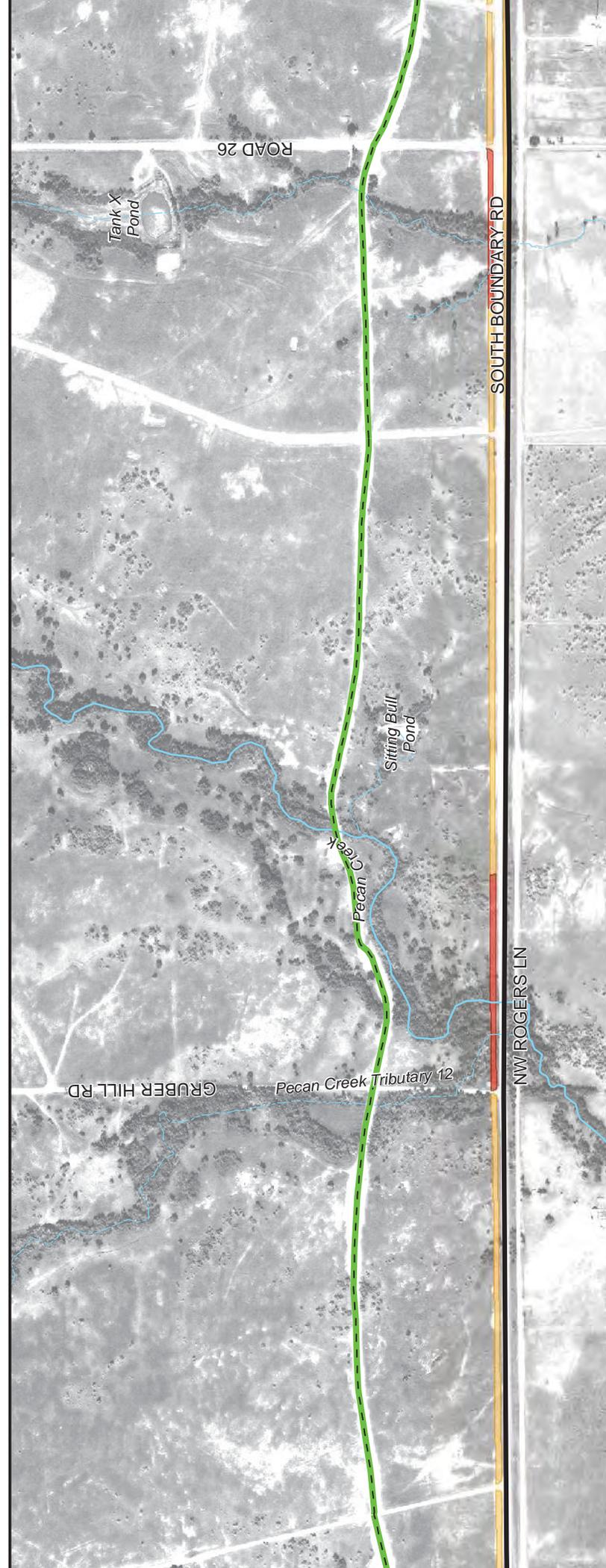
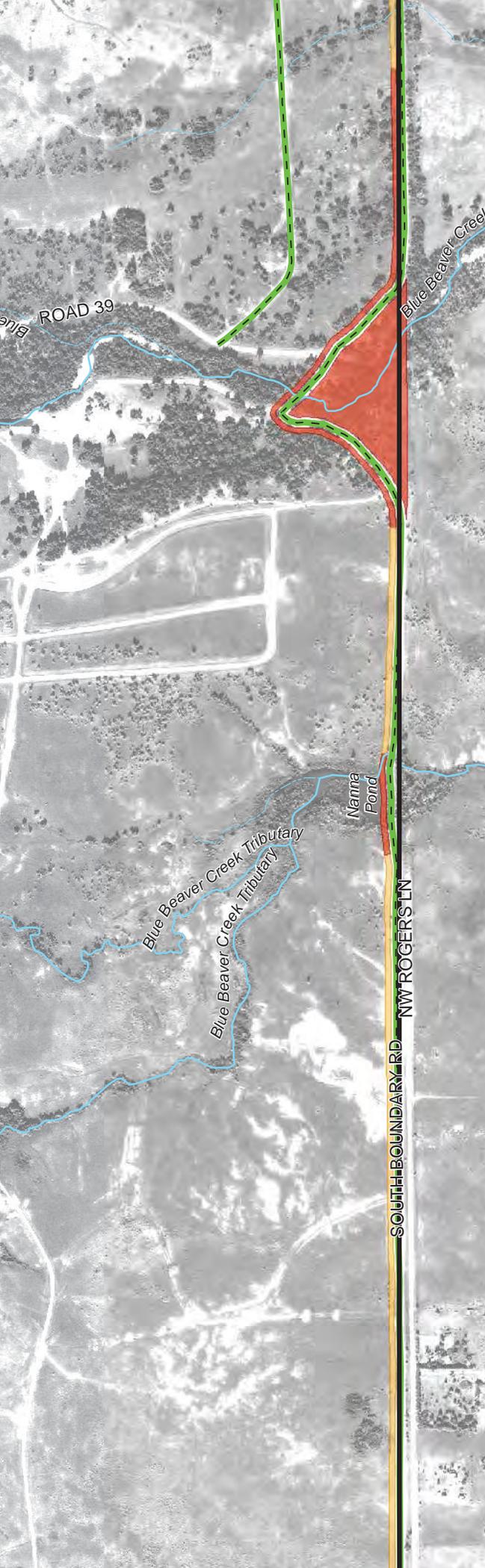
**Sources:**  
 Fort Sill, 2014-2015: Firebreaks, Impact Areas, Installation, Risk Areas, Roads, Training Area, Water, Woody Vegetation Removal Areas



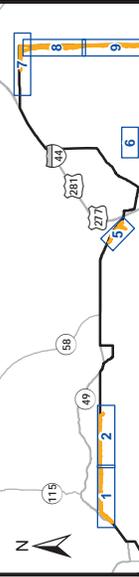
**Legend**

- Woody Vegetation Removal-Heavy Equipment Maint.
- Woody Vegetation Removal-Light Equipment Maint.
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- Firebreak Buffer (40-foot corridor)
- Existing Firebreak

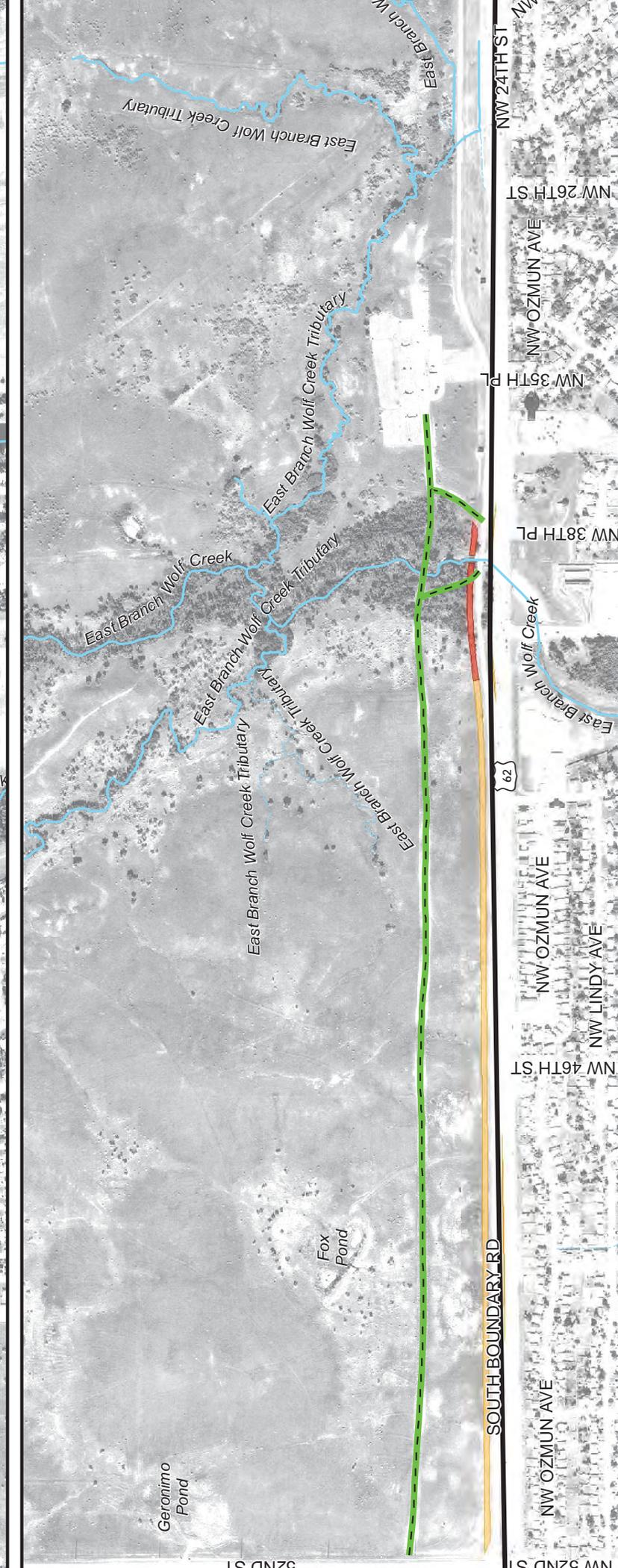
**Sources:**  
 Fort Sill, 2014-2015: Firebreaks, Impact Areas, Installation, Risk Areas, Roads, Training Area, Water, Woody Vegetation Removal Areas



- Legend**
- Woody Vegetation Removal-Heavy Equipment Maint.
  - Woody Vegetation Removal-Light Equipment Maint.
  - Proposed Firebreak
  - Firebreak Buffer (40-foot corridor)
  - Existing Firebreak



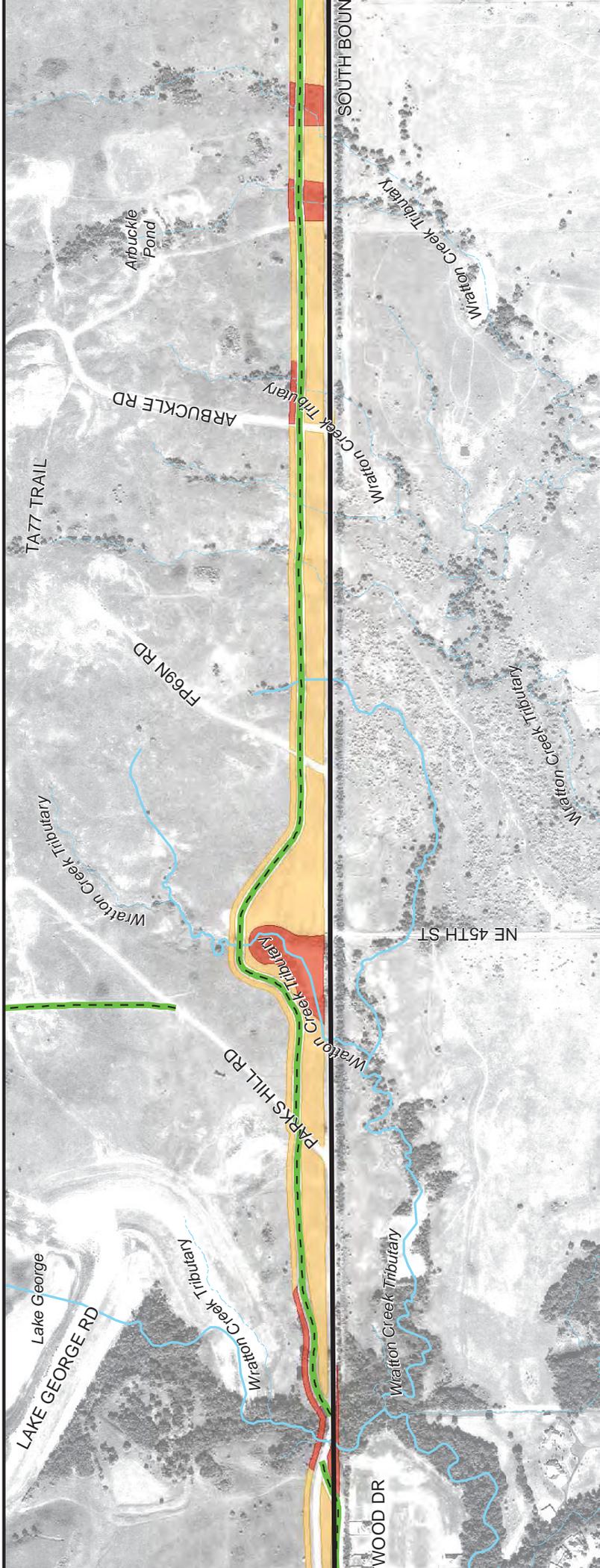
Sources:  
 Fort Sill, 2014-2015: Firebreaks, Impact Areas, Installation, Risk Areas, Roads, Training Area, Water, Woody Vegetation Removal Areas



**Legend**

- Woody Vegetation Removal-Heavy Equipment Maint.
- Woody Vegetation Removal-Light Equipment Maint.
- Existing Firebreak
- Proposed Firebreak
- Firebreak Buffer (40-foot corridor)

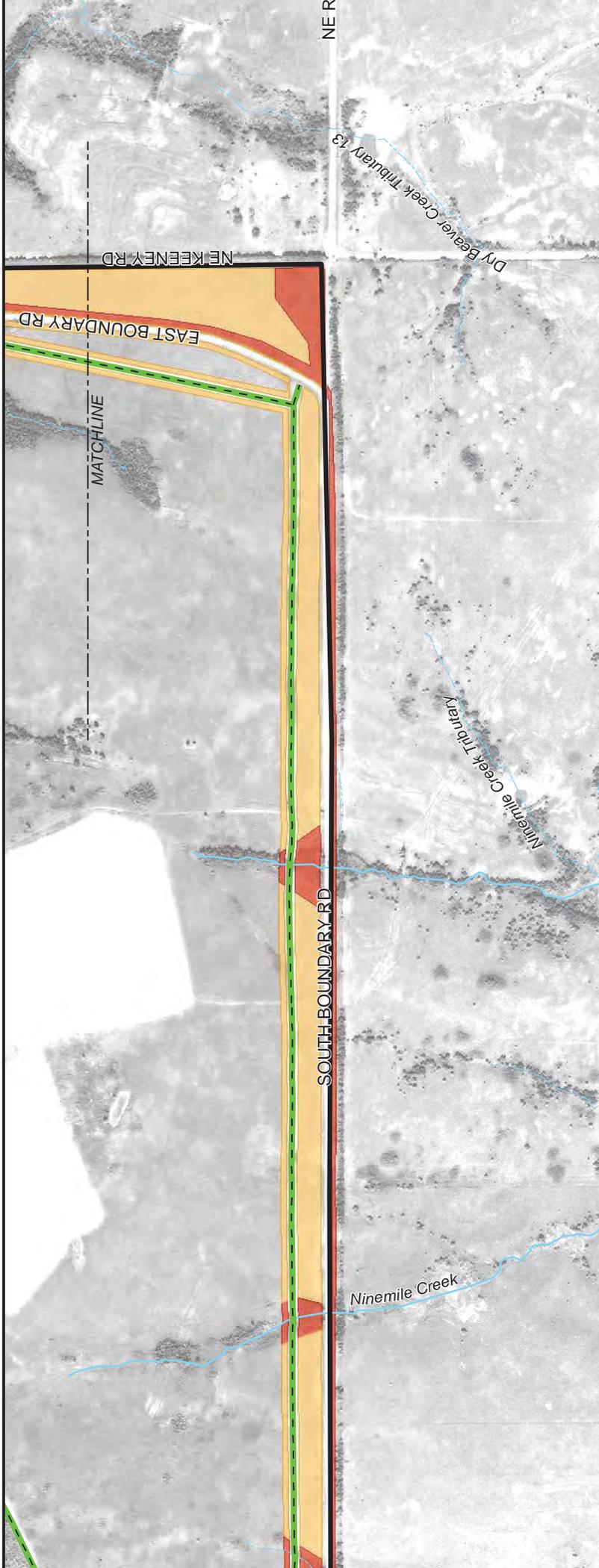
**Sources:**  
 Fort Sill, 2014-2015: Firebreaks, Impact Areas, Installation, Risk Areas, Roads, Training Area, Water, Woody Vegetation Removal Areas



**Legend**

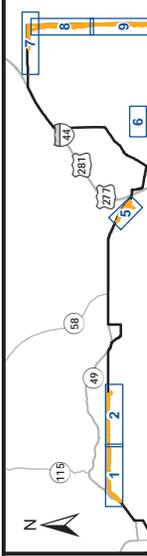
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- Firebreak Buffer (40-foot corridor)
- Existing Firebreak
- Proposed Firebreak



Sources:  
 Fort Sill, 2014-2015: Firebreaks, Impact Areas, Installation, Risk Areas, Roads, Training Area, Water, Woody Vegetation Removal Areas

**Appendix D**  
**Demographic Summary Report**



Location: User-specified linear location  
 Ring (buffer): 500-foot radius  
 Description:

Summary of ACS Estimates		2008 - 2012
Population		5,759
Population Density (per sq. mile)		1,130
Minority Population		2,918
% Minority		51%
Households		2,246
Housing Units		2,485
Housing Units Built Before 1950		129
Per Capita Income		23,092
Land Area (sq. miles) (Source: SF1)		5.10
% Land Area		99%
Water Area (sq. miles) (Source: SF1)		0.03
% Water Area		1%

	2008 - 2012 ACS Estimates	Percent	MOE (±)
<b>Population by Race</b>			
Total	5,759	100%	598
Population Reporting One Race	5,242	91%	1,589
White	3,241	56%	465
Black	1,257	22%	406
American Indian	387	7%	248
Asian	224	4%	195
Pacific Islander	22	0%	96
Some Other Race	111	2%	179
Population Reporting Two or More Races	518	9%	351
Total Hispanic Population	719	12%	281
Total Non-Hispanic Population	5,040		
White Alone	2,841	49%	415
Black Alone	1,195	21%	400
American Indian Alone	326	6%	248
Non-Hispanic Asian Alone	202	4%	195
Pacific Islander Alone	22	0%	96
Other Race Alone	17	0%	44
Two or More Races Alone	435	8%	360
<b>Population by Sex</b>			
Male	2,841	49%	365
Female	2,918	51%	320
<b>Population by Age</b>			
Age 0-4	578	10%	220
Age 0-17	1,678	29%	290
Age 18+	4,082	71%	379
Age 65+	575	10%	97

**Data Note:** Detail may not sum to totals due to rounding. Hispanic population can be of any race. N/A means not available.

**Source:** U.S. Census Bureau, American Community Survey (ACS) 2008 - 2012.

Location: User-specified linear location  
 Ring (buffer): 500-foot radius  
 Description:

	2008 - 2012 ACS Estimates	Percent	MOE (±)
<b>Population 25+ by Educational Attainment</b>			
Total	3,303	100%	354
Less than 9th Grade	144	4%	96
9th - 12th Grade, No Diploma	222	7%	85
High School Graduate	1,078	33%	155
Some College, No Degree	1,168	35%	253
Associate Degree	276	8%	147
Bachelor's Degree or more	691	21%	203
<b>Population Age 5+ Years by Ability to Speak English</b>			
Total	5,181	100%	579
Speak only English	4,531	87%	436
Non-English at Home <sup>1+2+3+4</sup>	650	13%	206
<sup>1</sup> Speak English "very well"	438	8%	155
<sup>2</sup> Speak English "well"	111	2%	80
<sup>3</sup> Speak English "not well"	34	1%	107
<sup>4</sup> Speak English "not at all"	67	1%	99
<sup>3+4</sup> Speak English "less than well"	101	2%	107
<sup>2+3+4</sup> Speak English "less than very well"	212	4%	118
<b>Linguistically Isolated Households*</b>			
Total	74	100%	91
Speak Spanish	7	10%	15
Speak Other Indo-European Languages	11	14%	17
Speak Asian-Pacific Island Languages	47	64%	90
Speak Other Languages	8	11%	45
<b>Households by Household Income</b>			
Household Income Base	2,246	100%	205
< \$15,000	350	16%	92
\$15,000 - \$25,000	231	10%	72
\$25,000 - \$50,000	713	32%	202
\$50,000 - \$75,000	451	20%	134
\$75,000 +	500	22%	176
<b>Occupied Housing Units by Tenure</b>			
Total	2,246	100%	205
Owner Occupied	1,163	52%	138
Renter Occupied	1,083	48%	202

**Data Note:** Detail may not sum to totals due to rounding. Hispanic population can be of any race. N/A means not available.

**Source:** U.S. Census Bureau, American Community Survey (ACS) 2008 - 2012.

\*Linguistically Isolated Households is available at the census tract summary level and up.



Location: User-specified linear location

Ring (buffer): 500-foot radius

Description:

	2008 - 2012 ACS Estimates	Percent	MOE (±)
<b>Population by Language Spoken at Home**</b>			
Total (persons age 5 and above)	5,181	100%	579
English	N/A	N/A	N/A
Spanish	N/A	N/A	N/A
French	N/A	N/A	N/A
French Creole	N/A	N/A	N/A
Italian	N/A	N/A	N/A
Portuguese	N/A	N/A	N/A
German	N/A	N/A	N/A
Yiddish	N/A	N/A	N/A
Other West Germanic	N/A	N/A	N/A
Scandinavian	N/A	N/A	N/A
Greek	N/A	N/A	N/A
Russian	N/A	N/A	N/A
Polish	N/A	N/A	N/A
Serbo-Croatian	N/A	N/A	N/A
Other Slavic	N/A	N/A	N/A
Armenian	N/A	N/A	N/A
Persian	N/A	N/A	N/A
Gujarathi	N/A	N/A	N/A
Hindi	N/A	N/A	N/A
Urdu	N/A	N/A	N/A
Other Indic	N/A	N/A	N/A
Other Indo-European	N/A	N/A	N/A
Chinese	N/A	N/A	N/A
Japanese	N/A	N/A	N/A
Korean	N/A	N/A	N/A
Mon-Khmer, Cambodian	N/A	N/A	N/A
Hmong	N/A	N/A	N/A
Thai	N/A	N/A	N/A
Laotian	N/A	N/A	N/A
Vietnamese	N/A	N/A	N/A
Other Asian	N/A	N/A	N/A
Tagalog	N/A	N/A	N/A
Other Pacific Island	N/A	N/A	N/A
Navajo	N/A	N/A	N/A
Other Native American	N/A	N/A	N/A
Hungarian	N/A	N/A	N/A
Arabic	N/A	N/A	N/A
Hebrew	N/A	N/A	N/A
African	N/A	N/A	N/A
Other and non-specified	N/A	N/A	N/A
Total Non-English	N/A	N/A	N/A

**Data Note:** Detail may not sum to totals due to rounding. Hispanic population can be of any race. N/A means not available.

**Source:** U.S. Census Bureau, American Community Survey (ACS) 2008 - 2012.

\*\*Population by Language Spoken at Home is available at the census tract summary level and up.

**Appendix E**  
**Prime Farmland Consultation Letter**



**DEPARTMENT OF THE ARMY**  
**US ARMY INSTALLATION MANAGEMENT COMMAND**  
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL**  
**2515 Ringgold ROAD**  
**FORT SILL, OKLAHOMA 73503**

October 6, 2015  
(Via U.S. Mail)

**SUBJECT:** Natural Resources Conservation Service (NRCS)  
Fire Mitigation Environmental Assessment  
U.S. Army Garrison Fort Sill, Oklahoma (Comanche County)

Mr. Kirk Schreiner  
District Conservationist  
NRCS – Lawton Service Center  
1606 NW Lawton Ave  
Lawton, OK 73507-3867

Dear Mr. Schreiner:

The U.S. Army Garrison Fort Sill, Oklahoma (Installation or Ft. Sill) is located in Comanche County in southwestern Oklahoma, about 50 miles north of Wichita Falls and 90 southwest of Oklahoma City (Figure 1). The Installation adjoins the municipalities of Cache, Lawton and Indianola on the south and Elgin and Medicine Park on the north. The Wichita Mountains National Wildlife Refuge (NWR) is located adjacent to the Installation's northwestern property boundary.

An Environmental Assessment (EA) is being prepared to evaluate the effects of additional, proposed fire mitigation measures to be implemented primarily at the East and West Training Ranges of the Installation. The Installation extends 27 miles in an east-west direction, four to nine miles in a north-south direction, and consists of 93,641 acres of land. The Installation includes military quarters, support areas, and almost 86,000 acres of range land devoted to U.S. military training activities conducted in accordance with U.S. Department of Defense (DoD) readiness requirements. Of the 86,000 acres of available range land, more than 48,000 acres is used for training and the remaining 38,000 acres are called Impact Areas, used for ordnance training and ordnance demolition activities. Approximately 73,000 acres of the existing Training Ranges are used year round for live-fire training and military exercises; live ordnance is fired at the target or Impact Area which may also include demolition training activities. Unexploded ordnance (UXO) is present on both training ranges at unmapped locations.

The purpose of the proposed fire mitigation activities is to provide increased fire protection for the Installation and nearby communities by helping prevent the spread of wildfires and minimizing public health risks to firefighters and the community during fires. In addition to the potential for human and wildlife impacts that occur during fire-fighting activities on some areas of the Installation, UXO also pose a threat of uncontrolled and unanticipated explosions especially of concern during fire-fighting activities.

The Installation already actively mitigates fire risks by maintaining existing firebreaks (corridors denuded of vegetation) and fuel load management techniques including agricultural leases and removal of grassy and woody vegetation along fences and within military quarters during grounds maintenance (Figure 2). In addition, the Installation conducts prescribed burns to control vegetation and encourage healthy re-growth, cuts down woody vegetation/timber on their timber leases, uses aerial spraying to control Honey Mesquite, and clears mesquite trees and brush that exhibit a large, dense fuel load. Existing conditions, including strong, high winds and areas with large fire fuel loads, cause extremely high risk to human health and the environment during fires and potential for fast-moving wildfires to occur. The presence of UXO and the potential occurrence of fast-moving fires at the Installation also cause traditional firefighting methods to be dangerous to humans and wildlife. These conditions and damage caused by recent wildfires in the Ft. Sill area, especially the 2011 Medicine Park fires and more recent 2015 fire, indicate that additional fire mitigation is necessary at the Installation. An illustration of urban areas (higher population centers) within 1 mile of the Installation is provided (Figure 3).

The additional fire mitigation activities include construction/maintenance of six miles of new, interior firebreaks that will be 40 feet wide at the East and West Training Ranges; mechanical removal of woody and grassy vegetation in a 430-acre area along 34 miles of existing roads such that the vegetation will be removed in linear corridors ranging between 15 to 800 feet wide or Woody Vegetation Removal Areas (WVRAs); and increased aerial spraying of noxious weeds and woody vegetation using best management practices to remove vegetation and reduce the fuel load in areas that are not suitable for mechanical clearing given the presence of UXO or inaccessibility of equipment or personnel (Figure 4).

The aerial spraying would be programmatic in nature and could involve locations throughout the Installation. To obtain approval of aerial spraying, requestors will prepare an Aerial Spray Statement of Need (ASSON) and submit it for review and consideration by the Installation's Environmental Quality Division. This practice is in compliance with the *Final Programmatic Environmental Assessment (PEA) for the Implementation of U.S. Army Integrated Pest Management Program*. This PEA and *Army Regulation 200-1 Environmental Protection and Enhancement* allow aerial application of chemicals to control overgrowth in ranges where UXO prevent normal Integrated Pest Management (IPM) practices. Both require an approved ASSON in compliance with individual installation's *Integrated Pest Management Plan*.

The location of the East and West Training Range firebreaks were selected to avoid aquatic resources and sensitive habitats, such as wetlands, streams, and protected habitat, while expanding the extent of existing firebreaks as much as possible. The location and extent of the six planned firebreaks were determined based on the results of the wildlife fire probability analysis with the goals of controlling the location of potential fires, reducing their ability to spread, and minimizing the conditions that can cause wildfires. WVRAs were identified through a similar process.

The Installation typically contains approximately 1,679 acres of leased farmland; the number of acres can fluctuate annually (Figure 2). The locations of the leased farmland are periodically changed by the Installation depending on training and operational needs. Typical crops are grass or hay that the leaseholder mows and processes for sale. The leased areas have restricted access during most of the year and are completely inaccessible during certain years. These leases also reduce fuel for wildfires by requiring farmers to harvest hay during designated periods. The terms of each lease describes the periods of access restriction.

Combinations of rock outcrop and Brico soils are common throughout the Installation. The majority of soils are made up of the Foard, Zaneis, Ashport, and Vernon soil series. Soil data is unavailable in four regions due to land use constraints and potential UXO, the Quannah Range, West Range, North Arbuckle in the West Range, and the South Arbuckle in the West Range. In compliance with federal laws and regulations, impacts to farmland have been avoided and will be minimized to the extent possible.

Form AD-1006 was completed for each of the three actions that may affect farmland areas: Aerial Spraying (Enclosure A), Proposed Firebreaks (Enclosure B), and WVRA (Enclosure C). Collectively, this combination of corridor and noncorridor components represents the entire Proposed Action. With this letter, we are requesting review of the enclosed Form AD-1006 (Farmland Conversion Impact Rating) prepared for each proposed fire mitigation action.

To aid your review, we have summarized below several of the assumptions used in the preparation of the individual Form AD-1006. All of the analysis is based upon GIS data provided by the Installation and other commonly used sources. GIS files of the individual project components are available by request.

- Region of Influence (ROI): Based upon the *Farmland Protection Policy Act (FPPA) Manual* instructions for assigning points on Form AD-1006, Part VI, Item 1 and Item 2, a 1-mile buffer around each of the actions that encompasses urban and non-urban areas has been established.
  - Figure 3 illustrates the proposed Prime Farmland ROI for the aerial spraying. Although areas where mechanical removal or ground-level spraying are impracticable due to the presence of UXO and impenetrable undergrowth will be prioritized for the implementation of aerial spraying measures, the entire Installation is being evaluated for impacts in the Draft EA due to programmatic nature of this component.
  - Figure 4 illustrates the proposed ROI for the Firebreaks and WVRAs.

- The combined ROI's for these areas will be considered the Farmland ROI for the entire Proposed Action in the Draft EA.
- Farmland Acreages: These estimates were derived using a GIS including available soil data and NRCS classifications (Figure 5). It is important to note that ranges with high concentrations of UXO have not been fully surveyed due to the danger of encountering UXO.
- Part III, Direct and Indirect Conversion of Farmland: Each action was reviewed to determine whether it would directly or indirectly convert farmland to nonfarmable land. Per the *FPPA Manual*, acres converted directly would be removed from agricultural production. Acreages converted indirectly would become nonfarmable due to other factors such as restricted access.
  - Aerial spraying: Aerial spraying is currently conducted at the Installation to control Honey Mesquite. Additional areas prioritized for aerial spraying will be those where severe undergrowth and potential UXO are present; however, the action is programmatic and could occur elsewhere on the Installation. Although the Installation only applies herbicides when wind speeds are less than five miles per hour, herbicides could drift from the intended area during spraying. It is not anticipated that aerial spraying would directly cause land to become permanently nonfarmable. As depicted by Enclosure A, 1,679 acres is identified as the maximum amount of leased, prime farmland acreage that may be converted indirectly to nonagricultural uses by proposed aerial spraying.
  - WVRA's and Firebreaks: Leasing military land for agricultural use is a fire mitigation strategy that decreases fuel storage through the harvest of biomass. There are nine agricultural leases on the Installation comprised of approximately 60 farm units. The proposed WVRA slightly overlaps a number of agricultural leases and will clear woody vegetation along perimeters of these lease areas. This will create a negligible short and long term impact on the lease and will likely improve harvest accessibility and harvest acreage. During construction, tree stumps and root systems would be left in place and only minor soil disturbances are anticipated. The areas would be maintained after initial construction and would not be utilized as farmland. Because construction and maintenance activities would not affect soil type but would restrict land from being farmed in the future, the proposed firebreaks would result the following land converted indirectly by the 13.99 acres (Enclosure B) and 131.8 acres for WVRA's (Enclosure C).
- Part VI, Site Assessment Criteria: The Site Assessment Criteria summarized by Part VI were developed based on conditions exhibited by leased farmland assuming that the proposed fire mitigation activities are implemented. Values of 0 are based upon the *FPPA Manual* criteria.
  - Factors 1 and 2, Area and Perimeter in Non-urban Use: Points were awarded to each proposed activity based on the percentage of urban area within each ROI using GIS.
  - Factor 3, Percent of the Site Being Farmed: Less than 20 percent of the area within each ROI has been farmed for more than 5 of the last 10 years.
  - Factor 4, Protection Provided by State and Local Government: None of the proposed activities received points for protection provided by state and local government because the construction and spraying will occur on the Installation and are subject to Installation laws and regulations rather than state agricultural protection.
  - Factor 5, Distance to Urban Built-up Area: A portion of each of the proposed activities' perimeters is less than 760 feet from a built-up area at which a density of 30 structures per 40 acres is present. Therefore, none of the proposed activities were awarded points for this factor.
  - Factor 6, Distance to Urban Support Services: The proposed firebreaks are the only proposed activity that received points because several services were located more than a mile away from the proposed firebreaks (Enclosure C). All of the facilities listed in the *FPPA Manual* as facilities that promote nonagricultural use exist within ½ mile of the proposed WVRA and aerial spraying perimeters.
  - Factor 7, Size of Present Farm Unit Compared to the Average: Factor 7 was calculated by a comparison of the size of leased farm units at the Installation to the average size of farms in Comanche County, OK as calculated by the U.S. Census Bureau (418 acres). Because each farm unit on the Installation was smaller than the county average, no points were awarded for Factor 7 for any of the proposed activities.

- Factors 8 through 12: None of the proposed activities received points for Factors 8 through 12. The activities would not prevent surrounding land from being farmed in the future. Due to the nature of the leases, farm support services and improvements are not located on the site.

We are requesting that your office provide information concerning impacts to prime farmland and existing farmland resulting from the proposed fire hazard mitigation activities. In addition, we would appreciate hearing of issues of interest to your agency that may need to be addressed by the Draft EA. The Draft EA will be publically noticed and should be available for a thirty-day public comment period later in 2015. We encourage you to monitor public notices for more information and provide comments when the Draft EA is released. Thank you for input on this important project. If you have any questions or need additional information to respond, please contact me at (580) 442-2849 or sarah.e.sminkey.civ@mail.mil. GIS files of the individual project components are available upon request. Your earliest reply will be appreciated.

Sincerely,



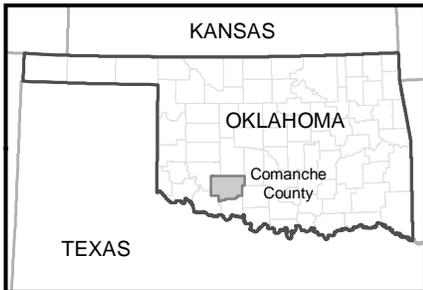
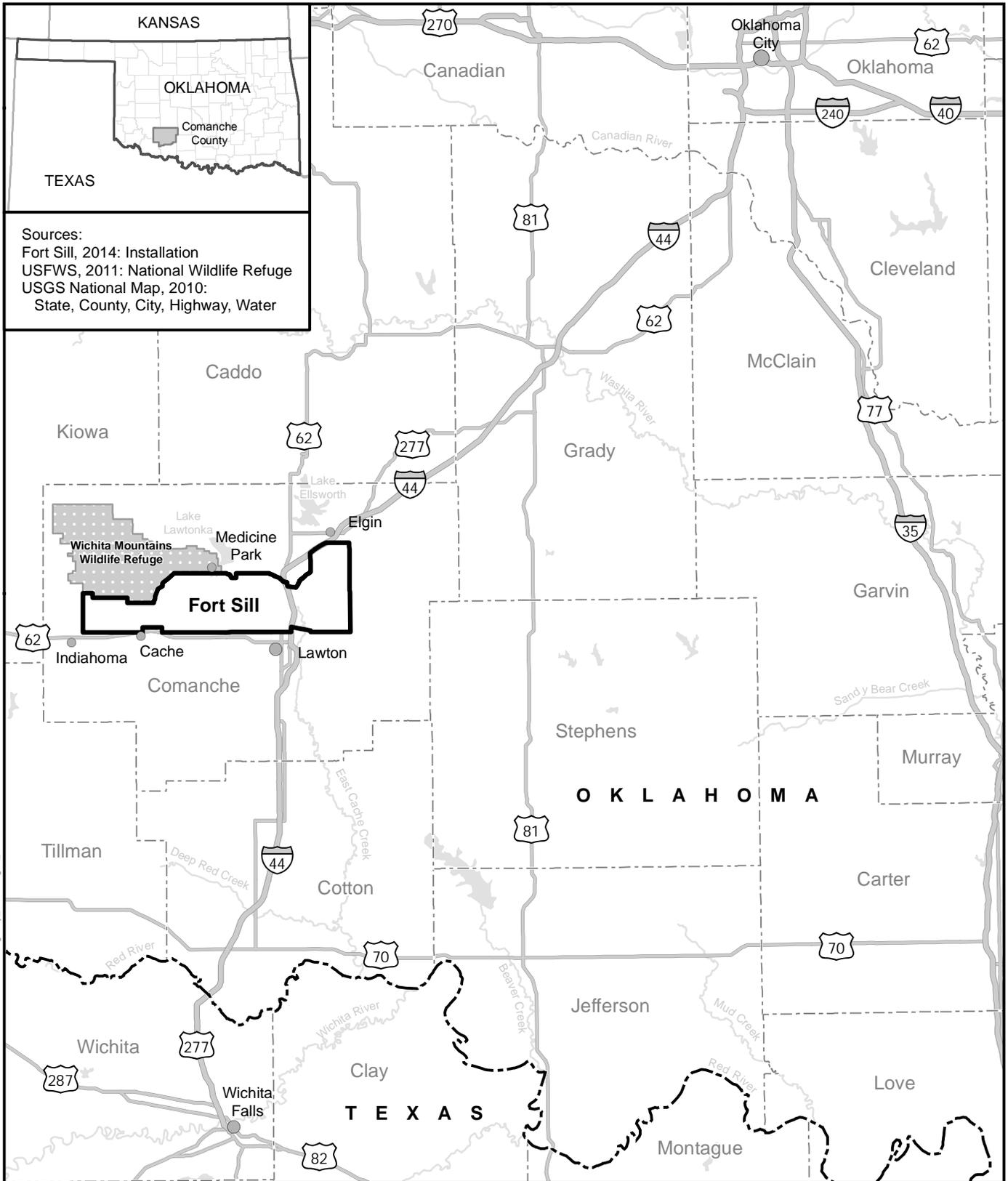
Sarah Sminkey  
National Environmental Policy Act Coordinator  
Environmental Quality Division, Support Branch

Enclosures

cc:

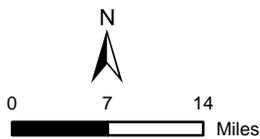
Lara Zuzak, AICP, PMP, Project Manager, URS Group, Inc.

## FIGURES



Sources:  
 Fort Sill, 2014: Installation  
 USFWS, 2011: National Wildlife Refuge  
 USGS National Map, 2010:  
 State, County, City, Highway, Water

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- Legend**
- Fort Sill Installation Area
  - National Wildlife Refuge
  - State Boundary
  - County Boundary
  - City
  - Highway
  - Major River



9400 Amberglen Blvd.  
 Austin, TX 78729  
 Phone: (512) 454-4797

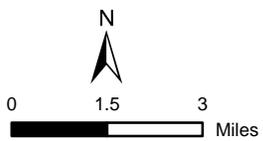
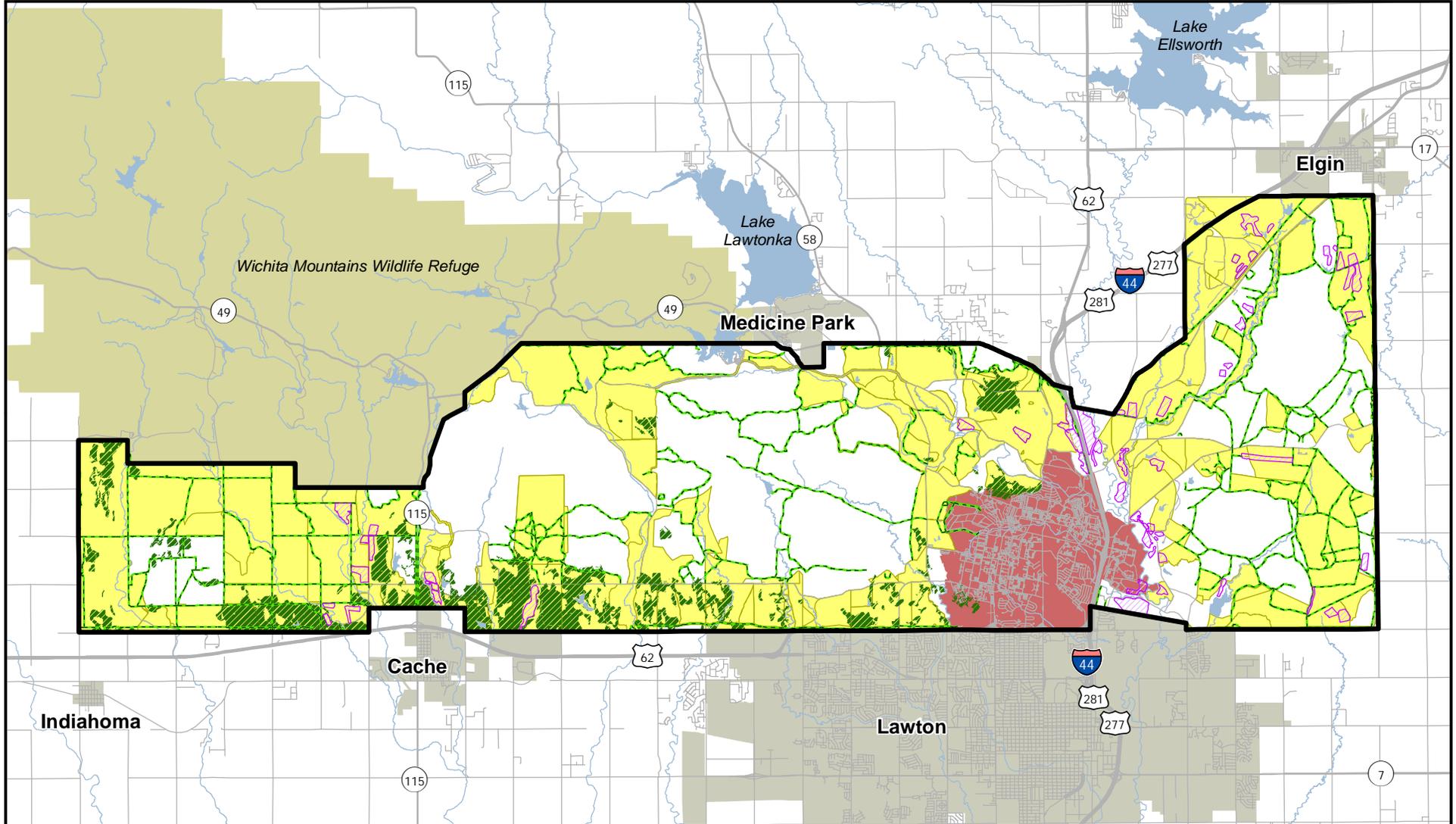
www.urs.com

## Location of Fort Sill

NRCS  
 Correspondence

Date: 9/14/2015

Figure 1



- Legend**
- Fort Sill Installation Area
  - City/Town
  - National Wildlife Refuge
  - Cantonment Area
  - Road
  - Water
  - Mesquite savanna (MS)
  - Existing Firebreak
  - Agricultural Lease
  - Potential Prescribed Burn Area

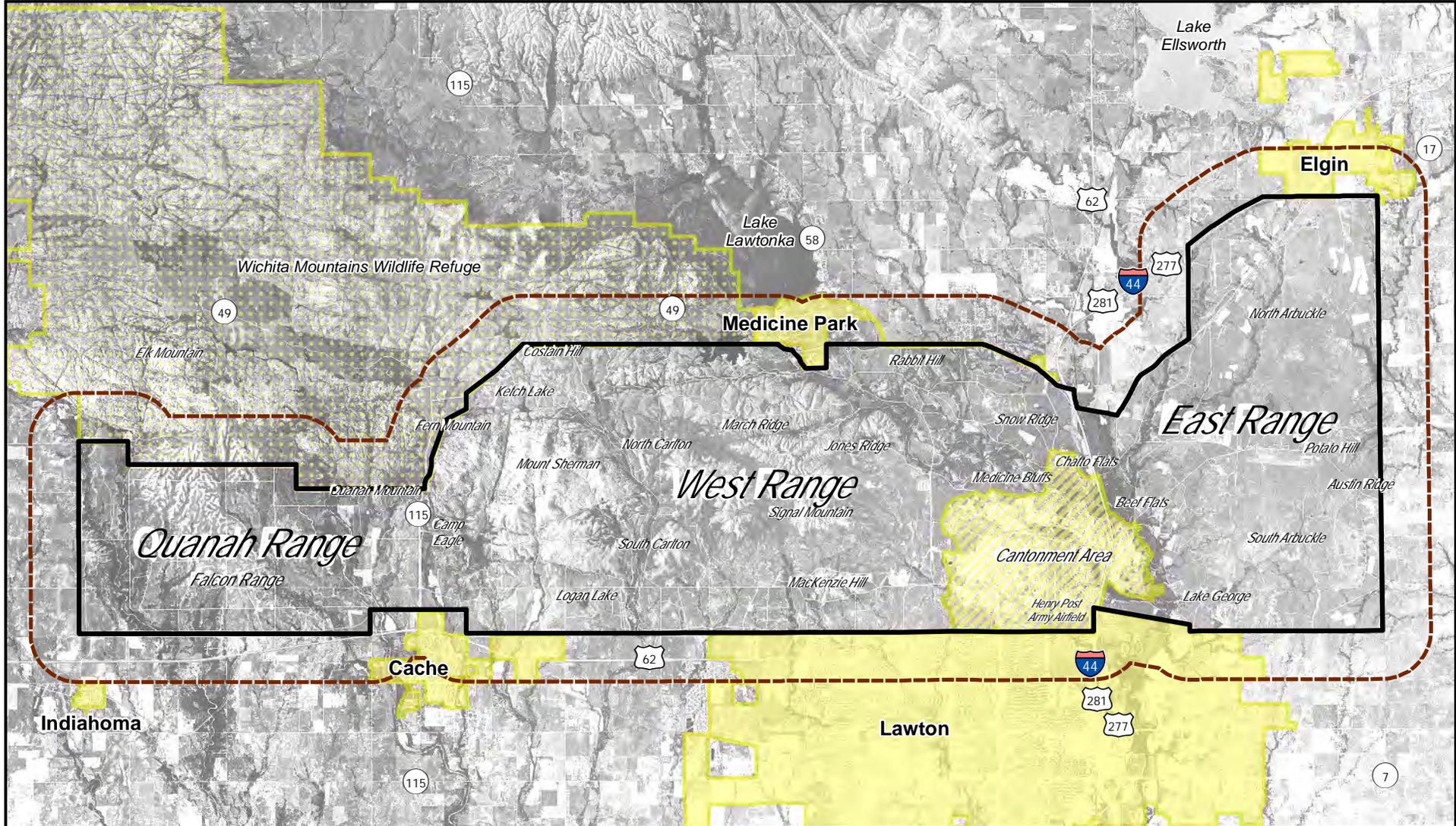
Sources:  
 Fort Sill, 12/2014: Installation, Roads, Water, Cantonment, Impact Areas, Risk Areas  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge

## Current Fire Mitigation Area

NRCS  
Correspondence

Date: 9/23/2015

Figure 2



9400 Amberglen Blvd.  
 Austin, TX 78729  
 Phone: (512) 454-4797  
 www.urs.com

**Legend**

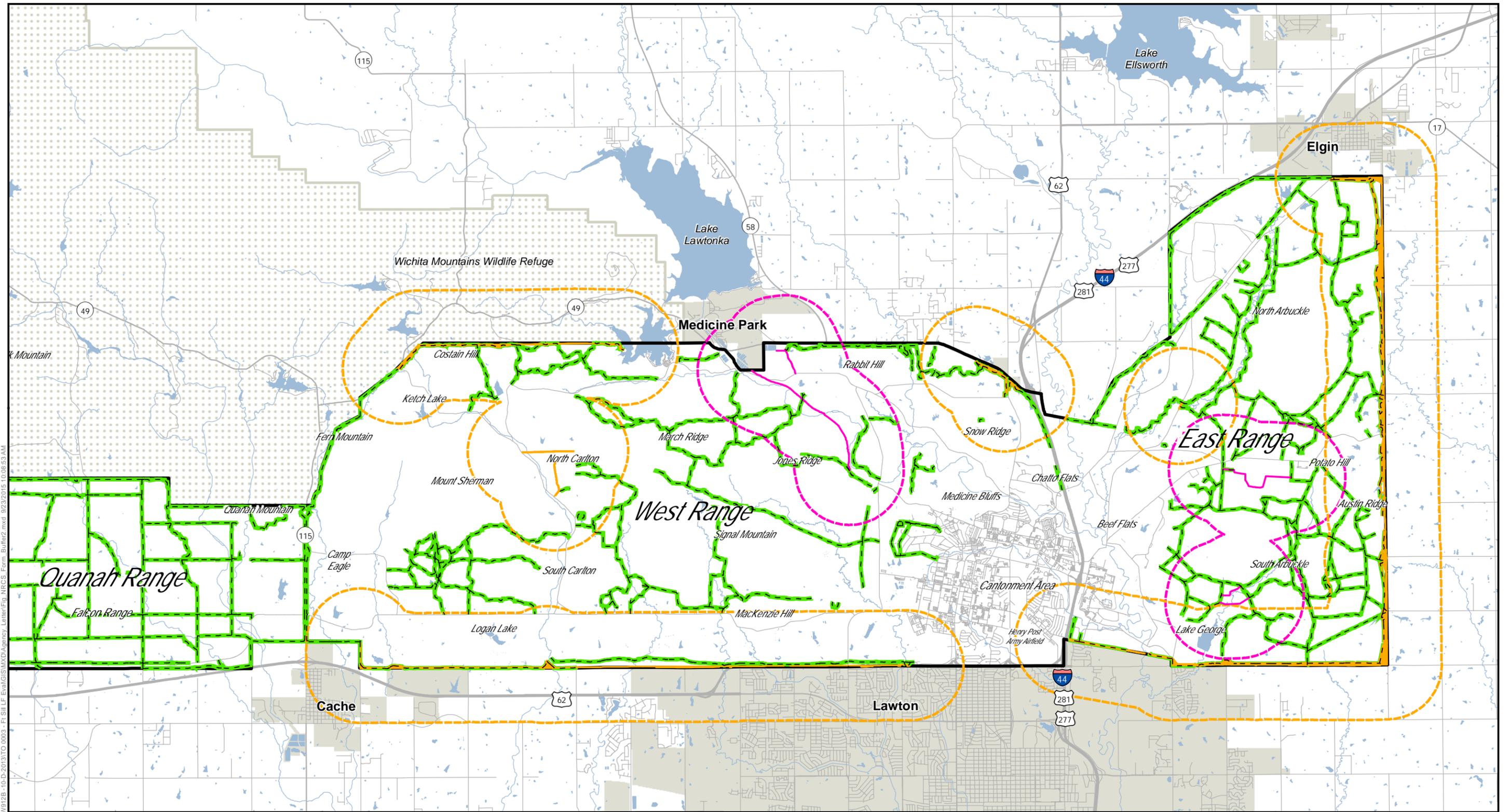
- Fort Sill Installation Area
- Installation Area 1-Mile Buffer
- Urban Area: City/Town
- Urban Area: Cantonment Area
- National Wildlife Refuge

**Sources:**  
 Fort Sill, 2014: Cantonment, Installation, Ranges, Roads, Water  
 U.S. Census Bureau, 2010: City/Town  
 USFWS, 2011: National Wildlife Refuge  
 USDA, 2014: Aerial Photo  
 URS, 2015: Buffer

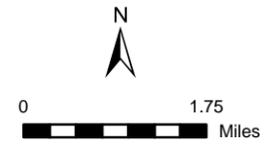
**Urban Areas**

NRCS  
Correspondence

Date: 9/23/2015	Figure 3
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**Legend**

- Fort Sill Installation Area
- City/Town
- National Wildlife Refuge
- Road
- Water
- Proposed Firebreak
- Existing Firebreak
- Woody Vegetation Removal Area
- Proposed Firebreak 1-Mile Buffer
- Woody Vegetation Removal Area 1-Mile Buffer

**URS**  
 9400 Amberglenn Blvd.  
 Austin, TX 78729  
 Phone: (512) 454-4797  
 www.urs.com

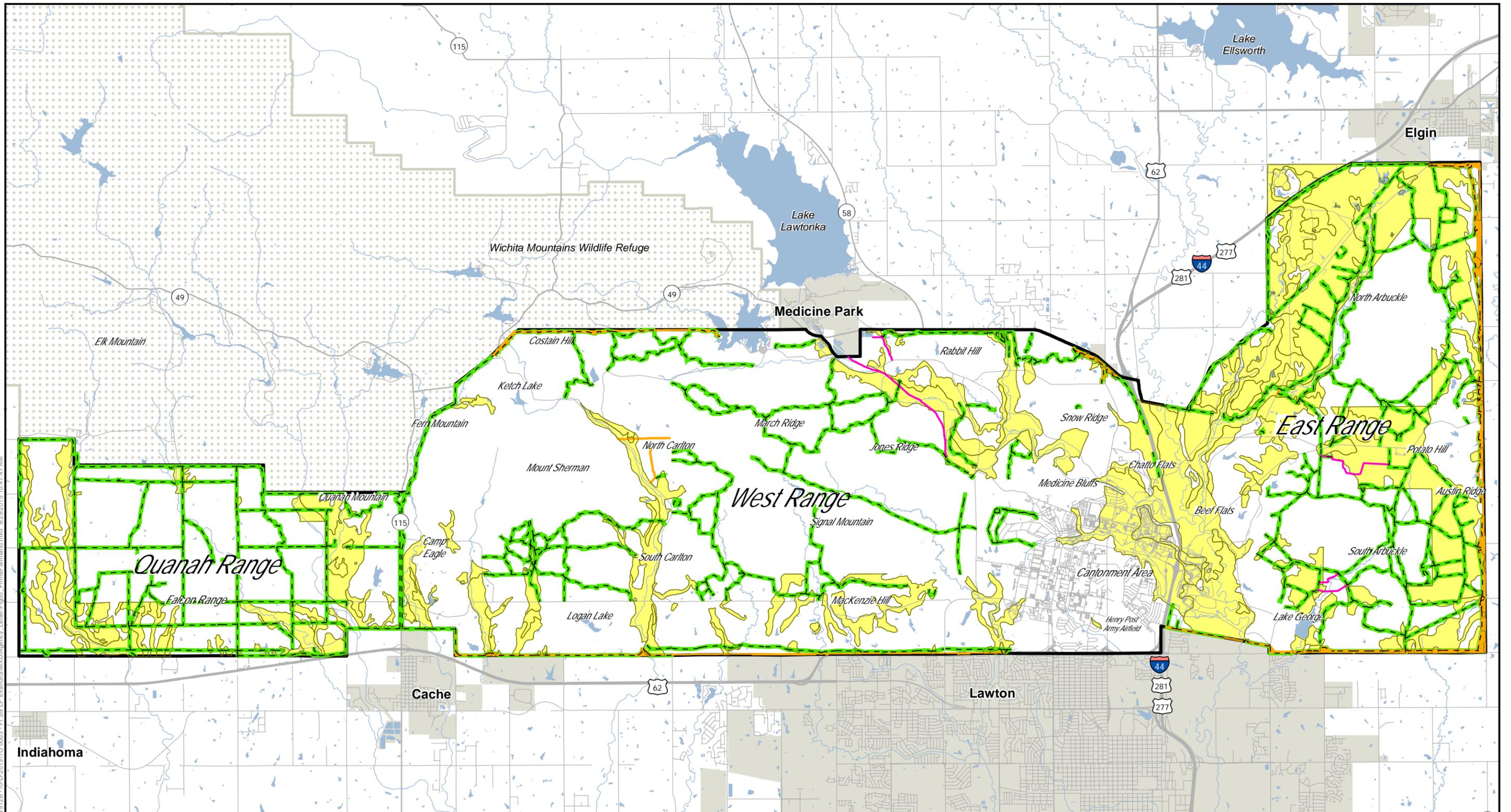
**Sources:**  
 Fort Sill, 2014-2015:  
 Cantonment, Firebreaks, Installation,  
 Ranges, Roads, Water, Streams, Soils,  
 Firebreaks, Woody Veg. Removal Areas  
 U.S. Census Bureau, 2010:  
 City/Town  
 USFWS, 2011: National Wildlife  
 Refuge  
 URS, 2015: Buffers

**Proposed Firebreaks and  
 Woody Vegetation  
 Removal Area Buffers**

NRCS  
 Correspondence

Date: 9/23/2015

Figure 4



File: L:\AEG\Projects\ENVUSACE\DOA\Systema\W912B-10-D-2013\TO 0003 - Ft. Sill LF Eval\GIS\MXD\Agency\_Letter\Fig05\_PrimeFarmland.mxd, 9/29/2015 10:47:47 AM

0 1.75 Miles

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Austin, TX 78729  
Phone: (512) 454-4797  
www.urs.com

**Legend**

- Fort Sill Installation Area
- City/Town
- National Wildlife Refuge
- Road
- Water
- Proposed Firebreak
- Existing Firebreak
- Prime Farmland Soils
- Woody Vegetation Removal Area

**Sources:**  
Fort Sill, 2014-2015:  
Cantonment, Firebreaks, Installation,  
Ranges, Roads, Water, Streams, Soils,  
Firebreaks  
U.S. Census Bureau, 2010:  
City/Town  
USFWS, 2011: National Wildlife  
Refuge  
FEMA, 2009, 2015: Floodplain

**Prime Farmland  
Soils**

NRCS  
Correspondence

Date: 9/29/2015	Figure 5
-----------------	----------

ENCLOSURE A

**FARMLAND CONVERSION IMPACT RATING**

<b>PART I</b> (To be completed by Federal Agency)		Date Of Land Evaluation Request				
Name of Project <b>Fort Sill Fire Mitigation - Aerial Spraying</b>		Federal Agency Involved <b>Fort Sill, OK</b>				
Proposed Land Use <b>Maintained ROW</b>		County and State <b>Comanche County, Oklahoma</b>				
<b>PART II</b> (To be completed by NRCS)		Date Request Received By NRCS		Person Completing Form:		
Does the site contain Prime, Unique, Statewide or Local Important Farmland? <i>(If no, the FPPA does not apply - do not complete additional parts of this form)</i>		YES <input type="checkbox"/>	NO <input type="checkbox"/>	Acres Irrigated		
Major Crop(s)		Farmable Land In Govt. Jurisdiction Acres:            %		Average Farm Size		
Name of Land Evaluation System Used		Name of State or Local Site Assessment System		Date Land Evaluation Returned by NRCS		
<b>PART III</b> (To be completed by Federal Agency)		Alternative Site Rating				
		Site A	Site B	Site C	Site D	
A. Total Acres To Be Converted Directly		0				
B. Total Acres To Be Converted Indirectly		0 to 1679				
C. Total Acres In Site		0 to 1679				
<b>PART IV</b> (To be completed by NRCS) Land Evaluation Information						
A. Total Acres Prime And Unique Farmland						
B. Total Acres Statewide Important or Local Important Farmland						
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted						
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value						
<b>PART V</b> (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)						
<b>PART VI</b> (To be completed by Federal Agency) Site Assessment Criteria <i>(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)</i>		<b>Maximum Points</b>	Site A	Site B	Site C	Site D
1. Area In Non-urban Use		(15)	13			
2. Perimeter In Non-urban Use		(10)	9			
3. Percent Of Site Being Farmed		(20)	0			
4. Protection Provided By State and Local Government		(20)	0			
5. Distance From Urban Built-up Area		(15)	0			
6. Distance To Urban Support Services		(15)	0			
7. Size Of Present Farm Unit Compared To Average		(10)	0			
8. Creation Of Non-farmable Farmland		(10)	0			
9. Availability Of Farm Support Services		(5)	0			
10. On-Farm Investments		(20)	0			
11. Effects Of Conversion On Farm Support Services		(10)	0			
12. Compatibility With Existing Agricultural Use		(10)	0			
TOTAL SITE ASSESSMENT POINTS		160	22	0	0	0
<b>PART VII</b> (To be completed by Federal Agency)						
Relative Value Of Farmland (From Part V)		100	0	0	0	0
Total Site Assessment (From Part VI above or local site assessment)		160	22	0	0	0
<b>TOTAL POINTS (Total of above 2 lines)</b>		260	22	0	0	0
Site Selected:		Date Of Selection		Was A Local Site Assessment Used? YES <input type="checkbox"/> NO <input type="checkbox"/>		
Reason For Selection:						
Name of Federal agency representative completing this form:					Date:	

## STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

- Step 1 - Federal agencies (or Federally funded projects) involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form. For Corridor type projects, the Federal agency shall use form NRCS-CPA-106 in place of form AD-1006. The Land Evaluation and Site Assessment (LESA) process may also be accessed by visiting the FPPA website, <http://fppa.nrcs.usda.gov/lesa/>.
- Step 2 - Originator (Federal Agency) will send one original copy of the form together with appropriate scaled maps indicating location(s) of project site(s), to the Natural Resources Conservation Service (NRCS) local Field Office or USDA Service Center and retain a copy for their files. (NRCS has offices in most counties in the U.S. The USDA Office Information Locator may be found at [http://offices.usda.gov/scripts/ndISAPI.dll/oip\\_public/USA\\_map](http://offices.usda.gov/scripts/ndISAPI.dll/oip_public/USA_map), or the offices can usually be found in the Phone Book under U.S. Government, Department of Agriculture. A list of field offices is available from the NRCS State Conservationist and State Office in each State.)
- Step 3 - NRCS will, within 10 working days after receipt of the completed form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland. (When a site visit or land evaluation system design is needed, NRCS will respond within 30 working days.
- Step 4 - For sites where farmland covered by the FPPA will be converted by the proposed project, NRCS will complete Parts II, IV and V of the form.
- Step 5 - NRCS will return the original copy of the form to the Federal agency involved in the project, and retain a file copy for NRCS records.
- Step 6 - The Federal agency involved in the proposed project will complete Parts VI and VII of the form and return the form with the final selected site to the servicing NRCS office.
- Step 7 - The Federal agency providing financial or technical assistance to the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA.

## INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

*(For Federal Agency)*

**Part I:** When completing the "County and State" questions, list all the local governments that are responsible for local land use controls where site(s) are to be evaluated.

**Part III:** When completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them or other major change in the ability to use the land for agriculture.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities planned build out capacity) that will cause a direct conversion.

**Part VI:** Do not complete Part VI using the standard format if a State or Local site assessment is used. With local and NRCS assistance, use the local Land Evaluation and Site Assessment (LESA).

1. Assign the maximum points for each site assessment criterion as shown in § 658.5(b) of CFR. In cases of corridor-type project such as transportation, power line and flood control, criteria #5 and #6 will not apply and will, be weighted zero, however, criterion #8 will be weighed a maximum of 25 points and criterion #11 a maximum of 25 points.
2. Federal agencies may assign relative weights among the 12 site assessment criteria other than those shown on the FPPA rule after submitting individual agency FPPA policy for review and comment to NRCS. In all cases where other weights are assigned, relative adjustments must be made to maintain the maximum total points at 160. For project sites where the total points equal or exceed 160, consider alternative actions, as appropriate, that could reduce adverse impacts (e.g. Alternative Sites, Modifications or Mitigation).

**Part VII:** In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, convert the site assessment points to a base of 160.

Example: if the Site Assessment maximum is 200 points, and the alternative Site "A" is rated 180 points:

$$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \times 160 = 144 \text{ points for Site A}$$

For assistance in completing this form or FPPA process, contact the local NRCS Field Office or USDA Service Center.

NRCS employees, consult the FPPA Manual and/or policy for additional instructions to complete the AD-1006 form.

ENCLOSURE B

## FARMLAND CONVERSION IMPACT RATING

<b>PART I</b> (To be completed by Federal Agency)		Date Of Land Evaluation Request				
Name of Project <b>Fort Sill Fire Mitigation - Proposed Firebreaks</b>		Federal Agency Involved <b>Fort Sill, OK</b>				
Proposed Land Use <b>Maintained Firebreak</b>		County and State <b>Comanche County, Oklahoma</b>				
<b>PART II</b> (To be completed by NRCS)		Date Request Received By NRCS		Person Completing Form:		
Does the site contain Prime, Unique, Statewide or Local Important Farmland? <i>(If no, the FPPA does not apply - do not complete additional parts of this form)</i>		YES <input type="checkbox"/>	NO <input type="checkbox"/>	Acres Irrigated	Average Farm Size	
Major Crop(s)	Farmable Land In Govt. Jurisdiction Acres:            %	Amount of Farmland As Defined in FPPA Acres:            %				
Name of Land Evaluation System Used	Name of State or Local Site Assessment System	Date Land Evaluation Returned by NRCS				
<b>PART III</b> (To be completed by Federal Agency)		Alternative Site Rating				
		Site A	Site B	Site C	Site D	
A. Total Acres To Be Converted Directly		0				
B. Total Acres To Be Converted Indirectly		13.99				
C. Total Acres In Site		13.99				
<b>PART IV</b> (To be completed by NRCS) Land Evaluation Information						
A. Total Acres Prime And Unique Farmland						
B. Total Acres Statewide Important or Local Important Farmland						
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted						
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value						
<b>PART V</b> (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)						
<b>PART VI</b> (To be completed by Federal Agency) Site Assessment Criteria <i>(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)</i>		<b>Maximum Points</b>	Site A	Site B	Site C	Site D
1. Area In Non-urban Use		(15)	15			
2. Perimeter In Non-urban Use		(10)	10			
3. Percent Of Site Being Farmed		(20)	0			
4. Protection Provided By State and Local Government		(20)	0			
5. Distance From Urban Built-up Area		(15)	0			
6. Distance To Urban Support Services		(15)	10			
7. Size Of Present Farm Unit Compared To Average		(10)	0			
8. Creation Of Non-farmable Farmland		(10)	0			
9. Availability Of Farm Support Services		(5)	0			
10. On-Farm Investments		(20)	0			
11. Effects Of Conversion On Farm Support Services		(10)	0			
12. Compatibility With Existing Agricultural Use		(10)	0			
TOTAL SITE ASSESSMENT POINTS		160	35	0	0	0
<b>PART VII</b> (To be completed by Federal Agency)						
Relative Value Of Farmland (From Part V)		100	0	0	0	0
Total Site Assessment (From Part VI above or local site assessment)		160	35	0	0	0
<b>TOTAL POINTS (Total of above 2 lines)</b>		260	35	0	0	0
Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES <input type="checkbox"/> NO <input type="checkbox"/>				
Reason For Selection:						
Name of Federal agency representative completing this form:					Date:	

## STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

- Step 1 - Federal agencies (or Federally funded projects) involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form. For Corridor type projects, the Federal agency shall use form NRCS-CPA-106 in place of form AD-1006. The Land Evaluation and Site Assessment (LESA) process may also be accessed by visiting the FPPA website, <http://fppa.nrcs.usda.gov/lesa/>.
- Step 2 - Originator (Federal Agency) will send one original copy of the form together with appropriate scaled maps indicating location(s) of project site(s), to the Natural Resources Conservation Service (NRCS) local Field Office or USDA Service Center and retain a copy for their files. (NRCS has offices in most counties in the U.S. The USDA Office Information Locator may be found at [http://offices.usda.gov/scripts/ndISAPI.dll/oip\\_public/USA\\_map](http://offices.usda.gov/scripts/ndISAPI.dll/oip_public/USA_map), or the offices can usually be found in the Phone Book under U.S. Government, Department of Agriculture. A list of field offices is available from the NRCS State Conservationist and State Office in each State.)
- Step 3 - NRCS will, within 10 working days after receipt of the completed form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland. (When a site visit or land evaluation system design is needed, NRCS will respond within 30 working days.
- Step 4 - For sites where farmland covered by the FPPA will be converted by the proposed project, NRCS will complete Parts II, IV and V of the form.
- Step 5 - NRCS will return the original copy of the form to the Federal agency involved in the project, and retain a file copy for NRCS records.
- Step 6 - The Federal agency involved in the proposed project will complete Parts VI and VII of the form and return the form with the final selected site to the servicing NRCS office.
- Step 7 - The Federal agency providing financial or technical assistance to the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA.

## INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

*(For Federal Agency)*

**Part I:** When completing the "County and State" questions, list all the local governments that are responsible for local land use controls where site(s) are to be evaluated.

**Part III:** When completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them or other major change in the ability to use the land for agriculture.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities planned build out capacity) that will cause a direct conversion.

**Part VI:** Do not complete Part VI using the standard format if a State or Local site assessment is used. With local and NRCS assistance, use the local Land Evaluation and Site Assessment (LESA).

1. Assign the maximum points for each site assessment criterion as shown in § 658.5(b) of CFR. In cases of corridor-type project such as transportation, power line and flood control, criteria #5 and #6 will not apply and will, be weighted zero, however, criterion #8 will be weighed a maximum of 25 points and criterion #11 a maximum of 25 points.
2. Federal agencies may assign relative weights among the 12 site assessment criteria other than those shown on the FPPA rule after submitting individual agency FPPA policy for review and comment to NRCS. In all cases where other weights are assigned, relative adjustments must be made to maintain the maximum total points at 160. For project sites where the total points equal or exceed 160, consider alternative actions, as appropriate, that could reduce adverse impacts (e.g. Alternative Sites, Modifications or Mitigation).

**Part VII:** In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, convert the site assessment points to a base of 160.

Example: if the Site Assessment maximum is 200 points, and the alternative Site "A" is rated 180 points:

$$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \times 160 = 144 \text{ points for Site A}$$

For assistance in completing this form or FPPA process, contact the local NRCS Field Office or USDA Service Center.

NRCS employees, consult the FPPA Manual and/or policy for additional instructions to complete the AD-1006 form.

ENCLOSURE C

**FARMLAND CONVERSION IMPACT RATING**

<b>PART I</b> (To be completed by Federal Agency)		Date Of Land Evaluation Request				
Name of Project <b>Fort Sill Fire Mitigation - WVRA</b>		Federal Agency Involved <b>Fort Sill</b>				
Proposed Land Use <b>Maintained ROW</b>		County and State <b>Comanche County, Oklahoma</b>				
<b>PART II</b> (To be completed by NRCS)		Date Request Received By NRCS		Person Completing Form:		
Does the site contain Prime, Unique, Statewide or Local Important Farmland? <i>(If no, the FPPA does not apply - do not complete additional parts of this form)</i>		YES <input type="checkbox"/>	NO <input type="checkbox"/>	Acres Irrigated	Average Farm Size	
Major Crop(s)	Farmable Land In Govt. Jurisdiction Acres:            %	Amount of Farmland As Defined in FPPA Acres:            %				
Name of Land Evaluation System Used	Name of State or Local Site Assessment System	Date Land Evaluation Returned by NRCS				
<b>PART III</b> (To be completed by Federal Agency)		Alternative Site Rating				
		Site A	Site B	Site C	Site D	
A. Total Acres To Be Converted Directly		0				
B. Total Acres To Be Converted Indirectly		131.8				
C. Total Acres In Site		131.8				
<b>PART IV</b> (To be completed by NRCS) Land Evaluation Information						
A. Total Acres Prime And Unique Farmland						
B. Total Acres Statewide Important or Local Important Farmland						
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted						
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value						
<b>PART V</b> (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)						
<b>PART VI</b> (To be completed by Federal Agency) Site Assessment Criteria <i>(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)</i>		<b>Maximum Points</b>	Site A	Site B	Site C	Site D
1. Area In Non-urban Use		(15)	15			
2. Perimeter In Non-urban Use		(10)	10			
3. Percent Of Site Being Farmed		(20)	0			
4. Protection Provided By State and Local Government		(20)	0			
5. Distance From Urban Built-up Area		(15)	0			
6. Distance To Urban Support Services		(15)	0			
7. Size Of Present Farm Unit Compared To Average		(10)	0			
8. Creation Of Non-farmable Farmland		(10)	0			
9. Availability Of Farm Support Services		(5)	0			
10. On-Farm Investments		(20)	0			
11. Effects Of Conversion On Farm Support Services		(10)	0			
12. Compatibility With Existing Agricultural Use		(10)	0			
TOTAL SITE ASSESSMENT POINTS		160	25	0	0	0
<b>PART VII</b> (To be completed by Federal Agency)						
Relative Value Of Farmland (From Part V)		100	0	0	0	0
Total Site Assessment (From Part VI above or local site assessment)		160	25	0	0	0
<b>TOTAL POINTS (Total of above 2 lines)</b>		260	25	0	0	0
Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES <input type="checkbox"/> NO <input type="checkbox"/>				
Reason For Selection:						
Name of Federal agency representative completing this form:					Date:	

## STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

- Step 1 - Federal agencies (or Federally funded projects) involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form. For Corridor type projects, the Federal agency shall use form NRCS-CPA-106 in place of form AD-1006. The Land Evaluation and Site Assessment (LESA) process may also be accessed by visiting the FPPA website, <http://fppa.nrcs.usda.gov/lesa/>.
- Step 2 - Originator (Federal Agency) will send one original copy of the form together with appropriate scaled maps indicating location(s) of project site(s), to the Natural Resources Conservation Service (NRCS) local Field Office or USDA Service Center and retain a copy for their files. (NRCS has offices in most counties in the U.S. The USDA Office Information Locator may be found at [http://offices.usda.gov/scripts/ndISAPI.dll/oip\\_public/USA\\_map](http://offices.usda.gov/scripts/ndISAPI.dll/oip_public/USA_map), or the offices can usually be found in the Phone Book under U.S. Government, Department of Agriculture. A list of field offices is available from the NRCS State Conservationist and State Office in each State.)
- Step 3 - NRCS will, within 10 working days after receipt of the completed form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland. (When a site visit or land evaluation system design is needed, NRCS will respond within 30 working days.
- Step 4 - For sites where farmland covered by the FPPA will be converted by the proposed project, NRCS will complete Parts II, IV and V of the form.
- Step 5 - NRCS will return the original copy of the form to the Federal agency involved in the project, and retain a file copy for NRCS records.
- Step 6 - The Federal agency involved in the proposed project will complete Parts VI and VII of the form and return the form with the final selected site to the servicing NRCS office.
- Step 7 - The Federal agency providing financial or technical assistance to the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA.

## INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

*(For Federal Agency)*

**Part I:** When completing the "County and State" questions, list all the local governments that are responsible for local land use controls where site(s) are to be evaluated.

**Part III:** When completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them or other major change in the ability to use the land for agriculture.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities planned build out capacity) that will cause a direct conversion.

**Part VI:** Do not complete Part VI using the standard format if a State or Local site assessment is used. With local and NRCS assistance, use the local Land Evaluation and Site Assessment (LESA).

1. Assign the maximum points for each site assessment criterion as shown in § 658.5(b) of CFR. In cases of corridor-type project such as transportation, power line and flood control, criteria #5 and #6 will not apply and will, be weighted zero, however, criterion #8 will be weighed a maximum of 25 points and criterion #11 a maximum of 25 points.
2. Federal agencies may assign relative weights among the 12 site assessment criteria other than those shown on the FPPA rule after submitting individual agency FPPA policy for review and comment to NRCS. In all cases where other weights are assigned, relative adjustments must be made to maintain the maximum total points at 160. For project sites where the total points equal or exceed 160, consider alternative actions, as appropriate, that could reduce adverse impacts (e.g. Alternative Sites, Modifications or Mitigation).

**Part VII:** In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, convert the site assessment points to a base of 160.

Example: if the Site Assessment maximum is 200 points, and the alternative Site "A" is rated 180 points:

$$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \times 160 = 144 \text{ points for Site A}$$

For assistance in completing this form or FPPA process, contact the local NRCS Field Office or USDA Service Center.

NRCS employees, consult the FPPA Manual and/or policy for additional instructions to complete the AD-1006 form.

**Appendix F**

**INRMP Supplement 1.5.1a.  
Selected Fauna Known to Occur on Fort Sill**

## Supplement 1.5.1a. Selected Fauna Known to Occur on Fort Sill

### Game Mammals, Including Furbearers

Common Name	Scientific Name	Comments
Badger	<i>Taxidea taxus</i>	Fairly common on East Range, little game value
Beaver	<i>Castor canadensis</i>	Common, causes significant damage to trees and pond dams, little game value, control effort increasing
Bison (Buffalo)	<i>Bison bison</i>	Occasional "escapee" from Refuge, protected
Bobcat	<i>Lynx rufus</i>	Fairly common, little game value
Coyote	<i>Canis latrans</i>	Common, little game value, major control effort to increase deer fawn survival
Deer, Mule	<i>Odocoileus hemionus</i>	Rare visitor, little game value
Deer, Whitetail	<i>Odocoileus virginianus</i>	Common, most popular game species
Elk (Wapiti)	<i>Cervus elaphus</i>	About 100 animals on West and varying numbers on Quanah, very high hunter interest but fairly low game potential due to low numbers
Fox, Gray	<i>Urocyon cinereoargenteus</i>	Fairly common in certain areas, little game value
Jackrabbit, Black-tailed	<i>Lepus californicus</i>	Common in a few areas, little game value
Mink	<i>Mustela vison</i>	Unconfirmed, but possible
Muskrat	<i>Ondatra zibethicus</i>	Rare, little game value
Opossum	<i>Didelphis virginianus</i>	Common, little game value
Rabbit, Cottontail	<i>Sylvilagus floridanus</i>	Common, population fluctuates from normal low levels to very high densities, moderate game value
Rabbit, Swamp	<i>Sylvilagus aquaticus</i>	Normally uncommon but occasional eruptions in good habitat along East Cache Creek (apparently cycle with cottontails), low game value
Raccoon	<i>Procyon lotor</i>	Common, most popular furbearer, moderate game value
Skunk, Striped	<i>Mephitis mephitis</i>	Common, little game value
Squirrel, Fox	<i>Sciurus niger</i>	Common, population fluctuates moderately, moderate game value
Weasel, Longtail	<i>Mustela frenata</i>	Rare, little game value

### Game Birds

Common Name	Scientific Name	Comments
Bufflehead	<i>Bucephala albeola</i>	Moderately common in fall, little game value
Canvasback	<i>Aythya valisineria</i>	Fairly common in fall, common in late winter, moderate game value
Coot, American	<i>Fulica americana</i>	Common, little game value, nest on larger ponds
Crane, Sandhill	<i>Grus canadensis</i>	Uncommon, little game value

Crow, American	<i>Corvus brachyrhynchos</i>	Fairly common, little game value
Dove, Mourning	<i>Zenaidura macroura</i>	Common in spring-summer, fall migrant, preferred by hunters
Dove, Eurasian Collared	<i>Streptopelia decaocto</i>	
Goldeneye, Common	<i>Bucephala clangula</i>	Common in late fall-early winter, little game value
Goose, Snow/Blue	<i>Anser caerulescens</i>	Uncommon
Goose, White-fronted	<i>Anser albifrons</i>	Uncommon
Goose, Canada	<i>Branta canadensis</i>	Uncommon except those Giants stocked in 1983 which are huntable
Gadwall	<i>Anas strepera</i>	Common in fall, moderate game value
Mallard	<i>Anas platyrhynchos</i>	Common in fall, moderate game value, breeding records
Merganser, Common	<i>Mergus merganser</i>	Fairly common in fall, little game value
Merganser, Redbreasted	<i>Mergus serrator</i>	Rare, little game value
Merganser, Hooded	<i>Lophodytes cucullatus</i>	Uncommon and often protected, little game value
Pheasant, Ringnecked	<i>Phasianus colchicus</i>	Stocked, population stable at low numbers, game potential low
Pintail	<i>Anas acuta</i>	Moderately common in fall, moderate game value
Prairie Chicken, Greater	<i>Tympanuchus cupido</i>	Stocked in 1978-79, probably disappeared in 1985-86
Quail, Bobwhite	<i>Colinus virginianus</i>	Numbers greatly fluctuate, most popular game bird
Rail, King	<i>Rallus elegans</i>	Uncommon, little game value
Rail, Virginia	<i>Rallus limicola</i>	Rare, little game value
Rail, Sora	<i>Porzana carolina</i>	Rare, little game value
Ring-necked Duck	<i>Aythya collaris</i>	Fairly common in fall, moderate game value
Redhead	<i>Aythya americana</i>	Moderately common in fall, moderate game value
Ruddy Duck	<i>Oxyura jamaicensis</i>	Uncommon, little game value
Scaup, Greater	<i>Aythya marila</i>	Uncommon, little game value
Scaup, Lesser	<i>Aythya affinis</i>	Fairly common in fall, moderate game value
Shoveler	<i>Spatula clypeata</i>	Fairly common in fall, little game value
Snipe, Common	<i>Capella gallinago</i>	Common in fall and winter, little game value
Teal, Blue-winged	<i>Anas discors</i>	Common in fall, moderate game value
Teal, Cinnamon	<i>Anas cyanoptera</i>	Rare, little game value
Teal, Green-winged	<i>Anas crecca</i>	Common in fall, moderate game value
Turkey, Rio Grande	<i>Meleagris gallopavo intermedia</i>	Numbers fluctuate, habitat limiting, preferred by hunters
Turkey, Eastern	<i>Meleagris gallopavo silvestris</i>	Possibly remnant birds which interbreed with Rio Grande birds, status needs to be confirmed
Widgeon, American	<i>Anas americana</i>	Common in fall, moderate game value
Woodcock, American	<i>Philohela minor</i>	Rare, little game value
Wood Duck	<i>Aix sponsa</i>	Fairly common in early fall, good nesting numbers on streams and some on ponds, moderate game value

## Other Game Species

Common Name	Scientific Name	Comments
Bullfrog	<i>Rana catesbeiana</i>	Common, limited game value, numbers fluctuate greatly

### Fish

Common Name	Scientific Name	Comments
Spotted Gar	<i>Lepisosteus oculatus</i>	Confirmed in Medicine Creek
Longnose Gar	<i>Lepisosteus osseus</i>	A few lakes and permanent streams
Gizzard Shad	<i>Dorosoma cepedianum</i>	A few ponds and permanent streams
Trout	<i>Salmo</i> spp	Put and take stocking in Quanah Lake and Medicine Creek
Stoneroller	<i>Campostoma anomalum</i>	Common in permanent streams
Carp	<i>Cyprinus carpio</i>	Widespread but only abundant in permanent streams and a few impoundments
Grass Carp	<i>Ctenopharyngodon idella</i>	Stocked in lakes and ponds for aquatic weed control
Golden Shiner	<i>Notemigonus crysoleucas</i>	Widespread but seldom abundant
Red Shiner	<i>Notropis lutrensis</i>	Common in streams and possibly in lakes
Sand Shiner	<i>Notropis stramineus</i>	Confirmed in West Cache, Post Oak, Quanah, and Blue Beaver creeks
Blacktail Shiner	<i>Notropis venustus</i>	Confirmed in Blue Beaver Creek
Bluntnose Minnow	<i>Pimephales notatus</i>	Confirmed in Post Oak and Blue Beaver creeks
Channel Darter	<i>Percina copelandi</i>	Confirmed in East Cache Creek
Suckermouth Minnow	<i>Phenacobius mirabilis</i>	Permanent streams
Fathead Minnow	<i>Pimephales promelas</i>	Uncommon in ponds and streams
Bullhead Minnow	<i>Pimephales vigilax</i>	Common in streams and lakes
River Carpsucker	<i>Carpionodes carpio</i>	Permanent streams
Smallmouth Buffalo	<i>Ictiobus bubalus</i>	Permanent streams
Golden Redhorse	<i>Moxostoma erythrurum</i>	Confirmed in Medicine, Blue Beaver, West Cache, and Quanah creeks and in 1976 pond
Spotted Sucker	<i>Minytrema melanops</i>	Confirmed in Medicine Creek
Black Bullhead	<i>Ictalurus melas</i>	Widespread and common
Yellow Bullhead	<i>Ictalurus natalis</i>	Widespread but more likely in streams
Channel Catfish	<i>Ictalurus punctatus</i>	Widespread, stocked, little reproduction, highly preferred for fishing
Blue Catfish	<i>Ictalurus furcatus</i>	Permanent streams and uncommon in lakes
Flathead Catfish	<i>Pylodictis olivaris</i>	Permanent streams and uncommon in lakes
Mosquito Fish	<i>Gambusia affinis</i>	Common in streams and ponds
Brook	<i>Labidesthes sicculus</i>	Uncommon in ponds and streams

Mississippi Silverside	<i>Menidia audens</i>	Confirmed in Blue Beaver Creek
Warmouth	<i>Lepomis gulosus</i>	Widespread in ponds and streams but not abundant
Green Sunfish	<i>Lepomis cyanellus</i>	Widespread in ponds and streams, abundance declining due to management for other species
Orangespotted Sunfish	<i>Lepomis humilis</i>	Uncommon in low densities in streams and large ponds
Bluegill	<i>Lepomis macrochirus</i>	Widespread, managed as primary prey, preferred by anglers, overpopulation tendency
Longear	<i>Lepomis megalotis</i>	Common in streams and in a few ponds
Redear Sunfish	<i>Lepomis microlophus</i>	Widespread, preferred by anglers, increasing due to management as prey
Smallmouth Bass	<i>Micropterus dolomieu</i>	Stocked in Medicine Creek in 1981-82, unconfirmed reports indicate they still are present
Spotted Bass	<i>Micropterus punctulatus</i>	Confirmed in Medicine Creek
Largemouth Bass	<i>Micropterus salmoides</i>	Widespread, most preferred by anglers, management priority
White Crappie	<i>Pomoxis annularis</i>	Common in permanent streams and a few lakes, preferred by anglers
Black Crappie	<i>Pomoxis nigromaculatus</i>	Common in permanent streams and a few lakes, preferred by anglers
Walleye	<i>Stizostedion vitreum</i>	Stocked in Lake Elmer Thomas with no confirmed success, confirmed in Medicine Creek
Logperch	<i>Percina caprodes</i>	Common in all major streams
Orangethroat	<i>Etheostoma spectabile</i>	Confirmed in Medicine Creek
Freshwater Drum	<i>Aplodinotus grunniens</i>	Medicine and East Cache creeks

### Amphibians and Reptiles

Order	Family	Number Genera	Number Species	Number Specimens
Caudata <sup>1</sup>	Ambystomatidae	1	1	3
Anura	Microhylidae	1	1	32
	Bufo	1	3	14
	Hyla	2	3	58
	Rana	1	3	18
	Scaphiophrynus	1	1	1
Testudines	Chelydridae	1	1	1
	Kinosternidae	1	1	1
	Emydidae	3	3	11
	Trionychidae	1	1	3
	Cheloniidae	1	1	1
Squamata	Crotaphytidae	1	1	13
	Phrynosomatidae	2	2	7*
	Teiidae	1	1	11
	Scincidae	2	2	42
	Anguillidae	1	1	5
	Leptotyphlopidae	1	1	53
	Colubridae	14	17	171
	Viperidae	3	3	11

Source: Caldwell *et. al.* 1992

<sup>1</sup> Includes "lots" of larvae representing many more individuals

\* Includes a road-killed *Phrynosoma cornutum* that was not preserved

## Mussels

Native Species
<i>Amblema plicata</i> – Therridge
<i>Lampsilis teres</i> – Yellow sandshell
<i>Leptodea fragilis</i> – Fragile papershell
<i>Potamilus purpuratus</i> – Bleufer
<i>Pyganodon grandis</i> – Fat floater
<i>Quadrula quadrula</i> – Pimpleback
<i>Quadrula quadrula</i> – Mapleleaf
<i>Toxolasma parvus</i> – Lilliput
<i>Tritogonia verrucosa</i> – Pistolgrip
<i>Truncilla donaciformis</i> – Fawnsfoot
<i>Unio merus tetralamus</i> – Pondhorn
<i>Utterbackia imbecillia</i> – Paper pondshell
Exotic Species
<i>Corbicula fluminea</i> – Asian Clam

## Federally listed Threatened or Endangered Species

Common Name	Scientific Name	Comments
Black-capped Vireo	<i>Vireo atricapilla</i>	Endangered as of 1987

## Special Interest Bird Species\*\*

Common Name	Scientific Name	Comments
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Uncommon
Barn Owl*	<i>Tyto alba</i>	Occasional, uncommon in other areas
Bell's Vireo*	<i>Vireo bellii</i>	Common, uncommon to rare elsewhere, Bird of Conservation Concern
Bewick's Wren*	<i>Thryomanes bewickii</i>	Scarce, found nesting in Bluebird boxes
Bluebird, Eastern*	<i>Sialia sialis</i>	Common, major nest box program
Bonaparte's Gull	<i>Larus philadelphia</i>	Rare migrant, 5th record for area
Broad-winged Hawk*	<i>Buteo platypterus</i>	Only SW Oklahoma breeding records are on Fort Sill
Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>	Hypothetical, accidental
Burrowing Owl*	<i>Athene cunicularia</i>	Declining on Fort Sill, apparently due to prairie dog losses
Canyon Wren*	<i>Catherpes mexicanus</i>	Occasional, birders' special interest
Cassin's Sparrow	<i>Aimophila cassinii</i>	Bird of Conservation Concern
Common Poorwill*	<i>Phalaenoptilus nuttallii</i>	Common in western Fort Sill, uncommon elsewhere in SW Oklahoma
Dickcissel*	<i>Spiza americana</i>	Abundant, uncommon to rare in other parts of SW Oklahoma

Eurasian Collared Dove	<i>Streptopelia decaocto</i>	Confirmed in the cantonment area
Ferruginous Hawk	<i>Buteo regalis</i>	Always present but common in winter
Harris' Hawk	<i>Parabuteo unicinctus harrisi</i>	Rare, very few Oklahoma records
Harris' Sparrow	<i>Zonotrichia querula</i>	Unusually high winter numbers, Bird of Conservation Concern
Hudsonian Godwit	<i>Limosa haemastica</i>	Rare
Inca Dove	<i>Columbina inca</i>	Confirmed in the cantonment area
Ladder-backed Woodpecker*	<i>Picoides scalaris</i>	Uncommon, edge of range
Least Bittern*	<i>Ixobrychus exilis</i>	7th record for area
Lewis' Woodpecker*	<i>Melanerpes lewis</i>	2nd record for area, edge of range
Little Blue Heron	<i>Egretta caerulea</i>	Bird of Conservation Concern
Loggerhead Shrike*	<i>Lanius ludovicianus</i>	High breeding population, thought to be declining elsewhere
Long-billed Curlew	<i>Numenius americanus</i>	Bird of Conservation Concern
Mississippi Kite*	<i>Ictinia mississippiensis</i>	Formerly rare, large increases last 15 years, Bird of Conservation Concern
Northern Harrier	<i>Circus cyaneus</i>	Largest documented winter roost in North America (up to 1,000), First confirmed nest for SW Oklahoma on Fort Sill in 1986, Bird of Conservation Concern
Orchard Oriole*	<i>Icterus spurius</i>	Occasional
Osprey	<i>Pandion haliaetus</i>	Occasional, relatively rare elsewhere
Peregrine Falcon	<i>Falco peregrinus</i>	Rare
Red-headed Woodpecker*	<i>Melanerpes erythrocephalus</i>	Uncommon
Red-shouldered Hawk*	<i>Buteo lineatus</i>	15 of 18 SW Oklahoma sightings are on Sill, nested and banded on Quanah in 1989, confirmed breeder on Sill
Rock Wren*	<i>Salpinctes obsoletus</i>	Rare, birders' special interest
Rufous-crowned Sparrow*	<i>Aimophila ruficeps</i>	Common, uncommon elsewhere
Say's Phoebe	<i>Sayornis saya</i>	Rare migrant, few records
Scissor-tailed Flycatcher*	<i>Tyrannus forficatus</i>	Common
Short-eared Owl	<i>Asio flammeus flammeus</i>	Seasonally common to very distinct areas
Smith's Longspur	<i>Calcarius pictus</i>	Rare
Sprague's Pipit	<i>Anthus spragueii</i>	Rare
Swainson's Hawk	<i>Buteo swainsoni</i>	Occasional, Bird of Conservation Concern
Upland Sandpiper	<i>Bartramia longicauda</i>	Bird of Conservation Concern
Whistling Swan	<i>Olor columbianus</i>	Rare migrant
White-faced Ibis*	<i>Plegadis chihi</i>	Uncommon migrant
White-tailed Kite*	<i>Elanus leucurus</i>	3rd record for Oklahoma since 1860
White-winged Dove	<i>Zenaida asiatica</i>	Confirmed in the cantonment area

\* Confirmed or potential breeder on Fort Sill

\*\* Bird of Conservation Concern, formerly rare, rare elsewhere, potentially rare, on edge of range, etc.

### Special Interest Mammal Species\*\*

Common Name	Scientific Name	Comments
Bat, Silver-haired	<i>Lasionycteris noctivagans</i>	Confirmed, one of few Oklahoma records
Bat, Mexican Free Tailed	<i>Tadarida brasiliensis</i>	Confirmed on West Cache Creek
Bat, Red	<i>Lasiurus borealis</i>	Confirmed in cantonment area
Bat, Hoary	<i>Lasiurus cinereus</i>	Confirmed in cantonment area and West Range
Cougar	<i>Puma concolor</i>	Confirmed but probably only occasional visitor from Refuge, protected
Black-tailed Prairie Dog	<i>Cynomys ludovicianus</i>	Reintroduced to East Range (North Arbuckle) in 2003
Flying Squirrel (Southern)	<i>Glaucomys volans</i>	Rare on East Cache and Medicine creeks, outside normal range
Fox, Red	<i>Vulpes vulpes</i>	Rare, one confirmed sighting, protected
Porcupine	<i>Erethizon dorsatum</i>	Uncommon
Prairie Vole	<i>Microtus ochrogaster</i>	Common to South Arbuckle, nearest population is north of Oklahoma City
Pine Vole	<i>Pitymys pinetorm</i>	Confirmed on South Arbuckle
Ringtail	<i>Bassariscus astutus</i>	One confirmed sighting on Quanah Range about 1980; confirmed again on West Range 1994; protected
Skunk, Spotted	<i>Spilogale putorius</i>	Uncommon, protected
Western Pipistrel	<i>Pipistrellus hesperus</i>	Confirmed in cantonment area

\*\* Formerly rare, rare elsewhere, potentially rare, on edge of range, etc.

## Checklist of Small Mammals on Fort Sill (Harris 1991)

### Mammals<sup>1</sup>

Common Name	Scientific Name	Common Name	Scientific Name
Virginia opossum	<i>Didelphis virginiana</i>	Nine-banded armadillo	<i>Dasypus novemcinctus</i>
Least shrew	<i>Cryptotis parva</i>	Coyote	<i>Canis latrans</i>
Gray fox	<i>Urocyon cinereoargenteus</i>	Striped skunk	<i>Mephitis mephitis</i>
Bobcat	<i>Lynx rufus</i>	Raccoon	<i>Procyon lotor</i>
White-tailed deer	<i>Odocoileus virginianus</i>	Wapiti (elk)	<i>Cervus elaphus</i>
Fox squirrel	<i>Sciurus niger</i>	Plains pocket gopher	<i>Geomys bursarius</i>
Hispid pocket mouse	<i>Perognathus hispidus</i>	Hispid cotton rat	<i>Sigmodon hispidus</i>
Prairie vole	<i>Microtus ochrogaster</i>	Deer mouse	<i>Peromyscus maniculatus</i>
White-footed mouse	<i>Peromyscus leucopus</i>	Texas mouse	<i>Peromyscus attwateri</i>
Plains harvest mouse	<i>Reithrodontomys montanus</i>	Fulvous harvest mouse	<i>Reithrodontomys fulvescens</i>
Eastern woodrat	<i>Neotoma floridana</i>	Eastern cottontail	<i>Sylvilagus floridanus</i>
Unidentified cottontail	<i>Sylvilagus</i> sp.		

## Supplement 2.3. History of Fort Sill Natural Resources Management

### *Pre-1965*

The history of natural resources management is sketchy prior to 1965. Hunting and fishing have probably occurred since Fort Sill was founded in 1869. A copy of the 1936-37 Fort Sill hunting and fishing regulations indicates that many of the same concerns regarding harvest control existed then as today. Hunting at Fort Sill was once used on a poster as a recruiting tool in the early part of the 20th Century.

Prior to about 1976 hunting and fishing programs were run out of a Game Farm which was staffed by NCOs on loan from military units. In 1958 the USFWS and ODWC became involved via a cooperative agreement.

Agricultural leasing began in the 1930s with a government option to take all or part of the hay for feed and bedding of government horses and mules. The Army Corps of Engineers began processing five-year agricultural leases in 1951. In 1952 most East Cache Creek bottomland was leased for alfalfa production. These leases were cancelled after a few years due to military training conflicts. Grazing leases were granted on about 14,000 acres in 1952. These were also terminated in 1955 due to conflicts with training. Sheep grazing leases were granted in 1952 and terminated in 1967. Numerous small hay leases were used until 1980 when they were combined into a single lease.

The first land management plan was developed in 1948. The primary purpose of this plan and subsequent leases through the 1960s was to maintain and improve cantonment areas (lawns, golf courses, cemeteries, airfields, etc.). In the late 1950s and 1960s the concept of multiple use was added to Fort Sill land management plans.

### *1965-1980*

In 1965 Fort Sill hired a professional wildlife biologist and created a Fish and Wildlife Section within the Buildings and Grounds Division, Directorate of Facilities and Engineering. This section had responsibility for management of fish and wildlife resources. The Fort Sill Fish and Wildlife Association, a sportsmen club, was formed in 1968 to control the recreational aspect of hunting and fishing as well as do some hands-on management of fish and wildlife and its habitat.

Early programs largely consisted of pond construction, food plots, tree plantings, game farm bird stocking, fish stocking, and wildlife law enforcement. The Fish and Wildlife Association controlled associated recreation, a small zoo, and the rearing of game birds. Coordination between the Biologist and the Association was often strained due to the issue of pen-reared birds. Stocking pen-reared game birds was stopped in 1975. Prior to 1976 the primary emphasis of the Fish and Wildlife Section was habitat management.

During the late 1960s or early 1970s wildlife law enforcement came under the Game Warden Section, Provost Marshal's Office. The staff was seven military police game wardens, but the Section was often understaffed.

In 1976 the Outdoor Recreation Division assumed all Fish and Wildlife Association duties. The staff of the newly created Fish and Wildlife Center included a full time civilian plus 8-10 military personnel. Hours of operation were irregular. The matter of the collection of accurate recreational and harvest data for the Biologist was a constant issue between Directorate of Facilities and Engineering and the Outdoor Recreation Division. The 3-way division of responsibilities was inefficient, and it resulted in considerable coordination problems. In 1977 the Fish and Wildlife Section was given Branch status and transferred to the new Environmental and Natural Resources Conservation Division, Directorate of Facilities and Engi-

neering. In 1979 all three sections moved to a new office complex at White Wolf Crossing. This complex also had a Conservation Education Center.

There were no serious problems implementing the Land Management Plan through the 1960s. By 1970 more modern weapons and changing military tactics began causing rapid rates of soil degradation in cantonment and range areas. Damage included soil compaction, deep ruts, vegetation losses, and increased erosion.

In 1970 a completely revised Conservation Plan was developed using assistance from the Soil Conservation Service. This included the post's first soil and vegetation surveys. The main management options recommended in this plan were accomplished during the 1970s and 80s. However, even this effort failed to keep up with the ever-increasing rate of damage to training lands by the military training mission.

### ***1980 to 1995***

In 1980 the Sportsmen Center (now the Fish and Wildlife Center) was transferred from DPCA to the Directorate of Engineering and Housing (formerly the Directorate of Facilities and Engineering) within the Fish and Wildlife Branch. Also that year, the Fish and Wildlife Administrator assumed a degree of operational control over military game wardens. In 1983, at the request of the Provost Marshal's Office due to manpower cuts, wildlife law enforcement was transferred to Fish and Wildlife, Directorate of Engineering and Housing. Two full time civilian authorizations were added to replace the 7 military slots.

By 1987 the Fish and Wildlife Branch was staffed with 1 GS-11 Fish and Wildlife Administrator, 1 GS-9 Fish and Wildlife Biologist, 1 GS-7 Wildlife Biologist, 3 GS-5 Wildlife Technicians, 1 GS-7 Sportsmen Services Coordinator, 1 GS-5 Assistant Sportsmen Coordinator, 2 GS-4 Sportsmen Aides, 1 GS-5 Fish and Wildlife Assistant (administrative) and 4 Special Duty military personnel. This staff was augmented with occasional temporary hires and regular use of military details. Most permanent civilian personnel were commissioned as Game Wardens.

Total staffing was less than used by the previous three directorates. The operation became 24 hours per day, year-round. The mission was greatly increased, principally in the areas of population management, enforcement, conservation education, and nongame management. Measured sportsmen satisfaction dramatically increased with the advent of the new integrated organization.

The Agronomist retired in 1990, and his position was replaced by an Integrated Training Area Management (ITAM) Coordinator to accommodate efforts to offset damage occurring on the rangeland. Former agronomy duties were part of the new ITAM coordinator's duties. This section reported directly to the Environmental Coordinator. Fort Sill was recognized as having the first functional Land Rehabilitation and Management aspect of the ITAM program, and it was the first installation to completely install all phases of ITAM. Its Range Conservation Plan (developed in 1985) was an independent forerunner of the ITAM program, which was developed by the U.S. Army Corps of Engineers Construction Engineering Research Laboratories.

In 1990 a Natural Resources Branch was created within the Environmental Division, Directorate of Engineering and Housing. This Branch had four sections, Fish and Wildlife, Sportsmen Services, ITAM, and Agronomy. This reorganization was a major improvement for more effective and efficient use of manpower and budgets. The ITAM and Agronomy sections were later combined to form the Land Management Section.

In late 1991 the Directorate of Engineering and Housing converted to a Public Works system, becoming the Directorate of Public Works. The Environmental Division labored under this system until October 1992 when Fort Sill recognized the importance of the environmental mission and established the Directorate of Environmental Quality. The new organizational structure under the Directorate of Environmental Quality soon consisted of the Natural Resources and Enforcement Division with four branches: Fish and Wildlife, Land Management, Sportsmen Services, and Ecological Services. Ecological Services was added to provide reimbursable assistance to other installation natural resources programs, particularly in the realm of Integrated Natural Resources Management Plans.

Major staffing changes occurred in the early 1990s including the addition of six persons to the Land Management Branch, the creation of the Ecological Services Branch with a staff of two, the addition of a Fish and Wildlife Biologist, and the creation of a natural resources career intern position. Staffing reached a high of 20 full-time permanents plus 4 Special Duty military personnel, 1 university contract employee, and 8 summer hires in 1993. In 1994 the monetarily successful Ecological Services was eliminated.

### ***1995 to 2002***

Between the mid-1990s and 2002 it was virtually impossible to replace personnel turnover due to manpower authorization cutbacks. A major reorganization was initiated in late-1998 to make Fort Sill's ITAM program responsibility consistent with Army-wide guidance. In 1999 ITAM program responsibility and Land Management Branch personnel were transferred to the Directorate of Public Works, and in 2000 transferred from the Directorate of Public Works to the Directorate of Plans, Training and Mobilization. However, Land Management personnel remained within the Directorate of Public Works and other organizations on Fort Sill. In 2000 the Directorate of Plans, Training and Mobilization hired an ITAM Coordinator and in 2001 hired a Geographic Information System (GIS) Coordinator and a GIS Technician through a contract with Kansas State University.

By 2000 the Natural Resources Division's, Fish and Wildlife and Sportsmen Services branches included only 7 full-time permanent positions, with 6 positions filled. All 7 remaining Natural Resources positions had collateral duties of Game Warden. In 2001 the decision was made to combine the Directorate of Environmental Quality with the Directorate of Public Safety, which included the Law Enforcement Command and the Fire Department. Thus, in FY02 Natural and Cultural Resources and Enforcement became a branch of Environmental Quality Division within the Directorate of Public Safety. During this general period, budgetary and personnel limitations severely hindered Natural and Cultural Resources and Enforcement's ability to perform some program elements, such as fish surveys, prescribed burning, maintaining angler access (*i.e.*, cutting brush on pond dams, etc.), and providing educational experiences and presentations to the Fort Sill community.

### ***2002 to 2006***

In 2004 the Natural Resources and Enforcement Branch was reorganized into the Natural and Cultural Resources Branch (under the Environmental Quality Division), based on the standard installation organization by IMCOM - West, and was moved back to the Directorate of Public Works. There were significant issues regarding natural resources enforcement responsibilities, which are recommended to be combined with other installation law enforcement functions. However, due to the efficiencies and proven performance of natural resources enforcement within natural resources organizations since 1983, it was decided to leave this function within the Natural and Cultural Resources Branch.

### ***2007 to Present***

In 2007 the Environmental Quality Division was reorganized. Cultural resources management was transferred to the Environmental Compliance Assurance Branch, and the Natural and Cultural Resources Branch became the Natural Resources and Enforcement Branch. By 2013 there were only two Fort Sill Conservation Officers, the Branch Chief and an assigned Military Police person. During this period major

emphasis was placed on noxious animal control, especially feral hogs; new programs to control other invasive species; and improvements to the Conservation Education Center and programs for disabled veterans and Wounded Warriors. The period also was one of a tremendous increase in the range and numbers of Black-capped Vireos. On the negative side, Bobwhite Quail numbers reached all-time lows, consistent with region-wide and range-wide trends.

## Supplement 2.3.5.2.1. Fort Sill Deer Census Protocols

**General.** Procedures for deer census at Fort Sill originated with the first deer census project in 1976. Procedures were refined and tested during the first five years or so, as were data analyses. Among the items tested were time of year, time of day or night, daylight versus night, helicopters versus vehicles, types of vehicles, types of spotlights, size of survey crew, and data collected. These tests are described in various deer reports beginning with the 1976 report. Procedures used at Fort Sill have changed very little in the past 20 years. The ultimate usefulness of these data to manage installation deer herds is dependent upon this consistency of effort.

**Scheduling.** Spotlight deer count should be conducted from mid-August through about 20 September. Earlier counts significantly lower fawn/doe estimates due to less fawn movement. Later counts also lower fawn/doe estimates due to fawns losing spots and being more difficult to discern from does, especially lone fawns. There is some thought, but no hard evidence, that counts should not start until about 20 August.

**Census Effort.** Total effort requires about 20 all-night counts. Statistical tests in the early 1980s indicated that fewer counts make among-range comparisons less reliable, but overall installation-wide data clumping could be done with less counts. The requirement for 20 counts includes a few nights lost due to breakdowns and weather. It is suggested that if this affects more than 20% of counts, additional counts should be scheduled.

### Crew Scheduling

Advantages of having two crews at the same time are such that normal scheduling is for counts during three, long weekend (Friday through Monday) nights with two crews per night. A crew consists of two persons, at least one of whom has two or more years' experience with counts. Preferably, team leaders should have more experience in order to thoroughly "know" all the routes available. Both crew members should be Natural Resources and Enforcement Branch personnel. However, a few other persons have enough experience over many years to act as a crew member if required. When this occurs, it is important that the Natural Resources and Enforcement Branch crew member operate the spotlight most of the night.

The 4 nights per week is important due to access to the ranges. It is difficult to avoid troop activity and get access to the impact area on West Range during the week due to units in many training areas and all-night artillery firing. Thus, weekends are used primarily for West Range access while East and Quanah ranges are surveyed during Sunday and Monday.

Crews should report to work with enough time to get vehicles ready and be at the starting point at dark, with "dark" defined as dark enough to make the use of spotlights effective. It is easy to be late when working Quanah Range, in particular, so enough time for travel must be scheduled. Setup crews usually arrive at 1900-1930 with all crew members there by 2000. Crews should continue to census until it is light to the point where spotlights are not very effective. Late starts (in particular) and early stops result in significantly fewer deer seen.

### Route Scheduling – Ranges

There are four basic census areas: East Range, Quanah Range, and two halves of West Range. Each area should be surveyed equal times with a "time" being one full dark-dawn night. Range activity ultimately determines where crews will work, but over 90% of the time, the following works best:

- Friday-Saturday nights - both crews on West Range,

- Sunday-Monday nights - one crew on West Range and one crew on Quanah Range, or both crews on East Range.

If the above schedule is followed, 40 routes should end up with 10 counts each on East and Quanah and 20 counts on West. Crew members should be rotated to different routes as much as possible.

**West Range Routes.** Biologically, it does not matter how West Range is divided into halves. However, there are considerable advantages to having two different divisions (East-West and North-South). This two-halves system allows crew members different “looks” at West Range, which helps break the monotony. Also, different halves allow 4 different options, which enables the spotlight crew to better avoid troop activity. It is important to keep track of which routes are used to keep them equal. For example, the same number of South and North routes must be used, and the same number of East and West routes must be used. However, it does not really matter whether or not, for example, a different number of East and South routes are done if the previous rule is adhered to closely.

**Starting Points and Directions.** Routes are run along fairly natural patterns from a starting to a finish point which generally, except for East Range, covers most of the survey area. Thus, the starting point and the direction traveled from this point determines the time of night when a route will go through a given portion of the survey area. For example, if you start the western half of West Range at Blue Beaver and go west, you will cover the K areas during “prime deer movement time” which is generally just after dark and probably cover Ketch Lake area during mid-count doldrums. On the other hand, if you start at 10 Mile Crossing, you will get to Ketch Lake considerably earlier in all likelihood. Due to generally predictable deer movement times, it is best to move the starting point and starting direction as much as possible. Start at different places and go different directions whenever possible.

### **Routes**

Due to military activities, routes cannot be standardized, nor can they be scheduled in advance. Routes regularly change during the night as crews encounter deer that they must chase down to identify, troops in a given area, and obstacles, such as bad roads. The crew leader must know all possibilities for routes to travel to keep options open and, very importantly, hit all portions of each survey area roughly the same number of times during the survey period.

The easiest way to keep track of this is to have two permanent crew leaders, generally the two with the greatest knowledge of routes on all ranges. Then, if a crew leader must, for example, skip the northwestern corner of Quanah during one night, he or she will remember to cover it the next time on Quanah. This becomes most important on East Range. Due to this range’s size, it is impossible to cover all of it on one night, and the range is too small for two crews without some overlap of routes. Thus, crews must keep track (either mentally or in writing) of the portions of East Range “missed” during each count in order to ensure that some portions of the range are not either over or under counted.

Routes are roads and firebreaks for the most part. All are included, and efforts should be made to cover all about equally during the three weeks of counting, preferably all during different times of the night. However, there are also “standard” off-road routes, and these are difficult to learn, especially since they must be found at night. They are “more or less” standard, but due to the necessity to chase down deer, find drainage crossings, and check out hunches, they vary a bit. Thus, it is critical that new persons ride with very experienced persons to learn these routes.

The value of deer data depends upon its year-to-year consistency. Routes determine that consistency. The goal is for each crew to be equal in unit effort and ability. That goal may be impossible to attain, but it should constantly be pursued using on-the-job and strict adherence to procedures. As with roads, off-road routes should be run on a more or less equal basis.

Persons should be extremely careful with regard to off-road driving within restricted areas. There are some safe areas, but many are not. Experience should dictate decisions, and identifying a deer is never worth a significant safety risk.

**Weather Factors.** The only rule with regard to weather is that rainfall cancels counts. However, if rainfall cancels one crew, the other crew should continue if it is not raining. The difficulty is defining “rainfall”. A few examples seem to be best with regard to this nebulous area. Note that with each example, it would be helpful to talk to a weatherman with his or her radar. Therefore, if there is any suggestion of rain during the night, it is important to check with the weather station prior to leaving the office for counts.

- A big front is obviously moving in as evidenced by lightning activity to the northwest. As soon as it starts raining, quit... unless there is some reason to think it will stop soon.
- It is cloudy off and on all night with some lightning, winds, etc. in the area. It starts to sprinkle. Try to find a dry spot and wait and see what happens for a half hour. If it quits, go back to counting. If it does not seem like it is going to quit, go home.
- A thunderstorm moves in quickly, and rain starts coming down by the bucketfuls. Get to a dry area and wait a while to see if it is an isolated storm or an extended storm system. Decisions are tough on this one.
- It is nasty out there. The wind is blowing; lightning is on the horizon; clouds race by; and the feel of rain is in the air. You know deer will be tightly bedded and tough to see. Everything says “quit”. Don’t! If it doesn’t rain, you must keep counting. However, on nights like this, don’t wait as long after it starts raining to decide to go home.

### **Data Collected**

Data collected begins at the starting point. There, a standard census form is begun. Important items to enter include date (including year) that the count began on (example, a Saturday night count is dated on Saturday’s date); Natural Resources and Enforcement Branch crew (not necessary to add volunteers, unless they are part of official crew); time started; and route. Very important... do not forget to record the starting odometer reading. Weather information is optional.

Critical data collected during counts include deer, elk, and raccoons observed. Other animals often noted include bobcats and coyotes as well as unusual sightings or things to be passed on to supervisors or the day crew. Locations of deer, elk, and raccoons are important as they are put on maps, especially deer. Deer can be clumped if they are all in the same general area. It is important to note enough information about deer location to remember where deer were seen when decisions regarding whether or not they are duplicate sightings are made the next morning. When in doubt, do not clump small groups of deer.

Candlepower of spotlights has increased over the years, largely due to the nonavailability of the previous “less than 300,000 candlepower” standard. Commercially available lights now are 24 volts with 1-3 million candlepower. Natural Resources and Enforcement Branch personnel do not think the extra candlepower significantly affect deer/mile data.

There are no disadvantages to using whatever binoculars work best. It is generally most efficient if the driver uses the binoculars to identify animals, but this is not always true. The best situation is when there is a volunteer driver which leaves a Natural Resources and Enforcement Branch crew member to just identify critters and record data. Do not allow volunteers to identify and categorize deer or elk! Only record what you see! Use “unknowns” for deer and elk that only volunteers try to categorize.

Deer are identified according to buck, doe, fawn, or unknown categories. If there is any doubt, the correct category is “unknown”. Don’t assume... verify! A big and little deer side-by-side are not automatically a doe and fawn. A big deer is not necessarily a buck. A buck and another big deer are not necessarily two bucks. Bucks are further identified as yearlings or older. Yearlings are identified by a lack of antler spread. If a set of antlers has no spread, it should be categorized as “yearling” even if it has 10 points. If it has a spread, it is “older” even if it has 4 points. Defining spread is difficult, but it is easy if a person looks at many Fort Sill deer. If there is doubt of whether a confirmed “buck” is a yearling or older, call it a “yearling.”

Elk are categorized as bulls, cows, calves, or unknowns. The above deer discussion also holds with elk. If you are not sure, be conservative. Bulls are further divided into yearling (almost always spikes), mid-sized, and big bulls. Breaking out the latter two categories takes experience and is sometimes debatable, but the “err on the young side” rule holds as with deer.

Elk in herds are major problems. Several rules of thumb are important. First, get a herd count... the most important datum. Then work the group as it moves from front to back, or from one side to another if the herd is stationary. Count bulls and calves out loud for the spotlight holder to keep track of totals. Subtract from total herd size to get cow counts. Recheck your numbers if possible. If you work a herd systematically and carefully, it is easier than trying to deal with the whole group as a unit. If the herd is moving, pick a place and count out loud as they pass, hopefully in a “more or less” file.

In the morning, remember to record the ending odometer. Then calculate miles driven. If during the night, a crew has to quit counting to do something else (such as fight wildfires), remember to record the miles lost from the count and subtract them in the morning.

Total each column on the sheets. To double check accuracy, be sure that the column totals agree with the total deer column total.

### **Mapping Deer**

It is important to put pins on the map for deer seen as soon as possible when counts are completed. However, since these pins are counted at the end of the census to provide minimum herd size estimates, there are efforts to avoid likely duplicates. This is the most “nebulous” piece of data attempted with regard to deer census.

Assume that does with fawns move very little, so deer as close as 1/4 mile of pinned doe/fawn groups should be categorized as “new deer” in many cases. Bucks, especially big bucks, often stay in similar groups. However, they move more than does and fawns, especially as September gets later. Use caution, but do not worry about over-counting a few bucks. If you think there is a reasonable chance that they are different, pin them. It is important to recognize that some deer are never seen, so an occasional duplicate deer is not a serious data problem.

As the season goes on, there are obvious places of high deer concentrations discovered, often in places like N2, Chatto Flats, Frisco Ridge, Beef Creek-firing complexes area, or perhaps agricultural fields. Keep total counts of bucks, does, and fawns for these areas, and when many pins become concentrated, only pin extra “total” numbers for the area. For example, if the northern portion of N2 (north of the airfield) is full of pins with 7 bucks (yellow), 22 does (red), and 18 fawns (green), and you count a total of 6 bucks, 24 does, and 17 fawns for this area, only pin the 2 “extra” does. Unknown deer are not pinned.