# Programmatic Environmental Assessment for Weapons Modernization Stationing, Fielding, Operations, and Maintenance Fort Sill, Oklahoma

**Final**

**June 2025**

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Cover Images:

Top photo: An Indirect Fire Protection Capability (IFPC) at night. Photo Credit, Heriberto Ibarra WSMR.

Bottom photo: A High-Power-Directed Energy (HP-DE) Palletized Load System based IFPC-High Energy Laser (IFPC-HEL) in a desert landscape. Photo credit, U.S. Army.

## INTRODUCTION

The National Environmental Policy Act of 1969 (NEPA) (42 United States [U.S.] Code Section 4321 et seq.) requires federal agencies to consider potential environmental impacts prior to undertaking a course of action. In accordance with NEPA and the Department of the Army's (Army) procedures, Environmental Analysis of Army Actions (32 Code of Federal Regulations [CFR] Part 651), the Army has prepared a Programmatic Environmental Assessment (PEA) titled "Programmatic Environmental Assessment for Weapons Modernization, Stationing, Fielding, Operations, and Maintenance Fort Sill, Oklahoma."

This PEA incorporated by reference in this Finding of No Significant Impact (FONSI), analyzes the potential environmental consequences from stationing and fielding, operations, and maintenance of up to five weapons systems at Fort Sill. These weapons systems include the Dark Eagle, Mid-Range Capability (MRC) System, Indirect Fire Protection Capability (IFPC), High-Power – Directed Energy (HP-DE) Systems, and the Lower Tier Air and Missile Defense Sensor (LTAMDS).

Fielding these systems would enhance the Army's capability to defeat advanced and future threats, providing new capabilities to soldiers, and integrate with new and existing systems. The intent of fielding and stationing these weapons systems is to create a modernized Army capable of conducting multi-domain operations as part of an integrated Joint Force that is ready to conduct multi-domain operations across an array of scenarios in multiple theaters by 2035.

This PEA provides a broad and programmatic analysis to determine potential impacts on the environmental and socioeconomic areas of concern. Decisions on which weapons systems to station at Fort Sill will be made by Army decision makers based on the information in this PEA/FONSI as well as other mission-related considerations.

## PROPOSED ACTION

The Army's proposed action is the fielding and stationing, operations, and maintenance of up to five weapons systems at Fort Sill. These systems are an essential step in the realization of the Army Modernization Strategy (AMS) outline for transforming the Army into a multi-domain force by 2035.

## PROPOSED ACTION ALTERNATIVES

The PEA evaluated two action alternatives and the no action alternative. The alternatives considered and analyzed in the PEA were:

### No Action Alternative

The no action alternative refers to the continuation of existing conditions without implementation of the proposed action. Implementation of the no action alternative would mean that none of the proposed weapons systems would be fielded or stationed at Fort Sill. Under the no action alternative, the Army would not enhance its structural Multi-Domain Operations capabilities. Although implementation of the no action alternative would not meet the purpose and need, or the objectives of the AMS, the no action alternative serves as the baseline for the comparison of potential impacts to all resource areas.

### Alternative 1

Alternative 1 includes the fielding and stationing of the IFPC and the HP-DE weapons systems along with their respective equipment and associated soldiers to Fort Sill. Alternative 1 meets all six of the screening criteria described in Section 2.2.

The fielding and stationing of the IFPC and HP-DE weapons systems involves the support of approximately 735 soldiers. An estimated 1,304 family members, including spouses and children, might accompany the soldiers. This could result in an overall increase of 2,039 to the Fort Sill population.

### Alternative 2

Alternative 2 includes the fielding and stationing of the Dark Eagle, MRC, IFPC, HP-DE, and LTAMDS weapons systems along with their respective equipment and associated soldiers to Fort Sill. Alternative 2 meets all six of the screening criteria described in Section 2.2.

The fielding and stationing of the Dark Eagle, MRC, IFPC, HP-DE, and LTAMDS weapons systems would require the support of approximately 865 to 925 soldiers. Using the upper limit of anticipated soldiers, an estimated 1,249 family members, including spouses and children, might accompany the soldiers. This could result in an overall increase of 2,174 people to the Fort Sill population.

## SUMMARY OF ENVIRONMENTAL EFFECTS

Each resource area was analyzed for potential impacts from the proposed action, including any reasonably foreseeable effects. Potential impacts that could result from the implementation of the action can be both beneficial and adverse. The degree of environmental beneficial and adverse impacts is characterized as none, negligible, minor, moderate/less than significant, significant but mitigable, and significant.

Impacts are anticipated to be minimized through avoidance, and the implementation of existing environmental protection measures. Avoidance strategies depend on the alternative selected, and where construction activities are planned. Examples of environmental protection measures would include implementing erosion and stormwater control measures; maintaining vehicles and equipment; and sustaining vegetation cover at the construction sites. The Army will continue to adhere to legal and regulatory requirements, and continue to implement its approved management plans, Standard Operating Procedures (SOPs), and Best Management Practices (BMPs).

Implementation of the selected alternative may require additional site-specific analyses, including follow-on NEPA evaluations, to address actions necessary for fielding, stationing, siting considerations, and other environmental issues. With the implementation of the identified BMPs outlined below and further evaluation of site-specific design plans, no significant impacts are anticipated from any of the proposed action alternatives assessed in this PEA.

The analysis in this PEA determined that BMPs may be implemented should future supporting construction and operation analysis activities be determined significant. Future anticipated operational impacts and associated BMP incorporation as follows will ensure impacts remain less than significant. These impacts and subsequent BMPs are detailed by resource area as described below.

- **Air Quality – Less than Significant**
    - *Impacts*: Alternative 1 would result in a slight increase in fuel use, air emissions, and traffic due to the fielding of new weapons systems and additional personnel., but emissions would not exceed air quality standards. Alternative 2 would have similar impacts as alternative 1, with slight increases in fuel use, air emissions, and traffic from the new weapons systems and personnel influx. These emissions would not be enough to cause a violation of an ambient air quality standard, nor would sensitive populations be impacted by training activities, so there would be no significantly adverse impacts. There is not enough information at this time to identify the exact level of increase if construction is required, but this determination could be made once the requirements are more fully known. At that point, supplemental NEPA analysis might be appropriate.
    - *Best Management Practice(s)*: For all alternatives, fugitive dust generation from weapon system maneuvers is expected and dust control measures may need to be implemented. If additional infrastructure is needed to support the weapons systems, construction may require permitting, and new stationary sources may need to be reviewed and included in the installation's air permit. Supplemental NEPA analysis may be required depending on the specific infrastructure requirements .
- **Biological Resources – Less than Significant**
    - *Impacts*: Both action alternatives could result in minor adverse impacts, with vegetation effects anticipated to be long-term due to ongoing live-fire and maneuver training. However, these impacts are considered to be minor and similar to the current activities occurring at Fort Sill. These impacts are not expected to have significant long-term effects on the viability of biological resources, as resident wildlife is likely to continue avoiding the impacted areas as previously documented.
    - *Best Management Practice(s)*: Implementing measures from the installation Integrated Natural Resources Management Plan, and existing BMPs, would effectively mitigate impacts. If new construction is needed, Endangered Species Act consultation with the U.S. Fish and Wildlife Service may be required. Additionally, using existing roads and adhering to established limits within training ranges and maneuver areas would help minimize potential adverse effects on protected species and their habitats.
- **Cultural Resources – Less than Significant**
    - *Impacts*: Increased training activities are expected to have less than significant impacts on cultural resources. However, an increase in personnel raises the risk of encountering or disturbing these resources. The addition of weapons systems and personnel may require new infrastructure or expanded training areas, though the extent, location, and design of potential construction are unknown. If new construction or repurposing of existing structures is necessary, supplemental NEPA documentation and/or Section 106 consultation would be required. Any ground-disturbing activities, which could impact cultural resources, would require identification before proceeding.
    - *Best Management Practice(s)*: Identifying resources within the area of potential effect before activities begin, combined with applying BMPs and mitigation measures, would help avoid adverse effects. Training personnel to report cultural

materials, and implementing BMPs would further reduce potential impacts. While an increase in personnel raises the likelihood of encountering or disturbing cultural resources, adherence to SOPs and BMPs for resource training, identification, and protection would effectively mitigate these impacts. If new construction is required to implement this alternative, supplemental NEPA analysis might be required.

- **Geological and Soil Resources – Less than Significant**
  - *Impacts*: Implementing either action alternative would increase maneuver training, potentially damaging vegetation, disturbing soils, and causing erosion or altered drainage patterns. Construction activities may also compact soils, increase erosion and stormwater runoff, and affect groundwater recharge. Neither alternative is anticipated to impact geologic, or soil resources and population increases are not expected to impact soils beyond those effects from construction and training, resulting in only minor soil impacts.
  - *Best Management Practice(s)*: Adhering to stormwater management plans and BMPs, along with the Integrated Training Area Management work plan and the installation's Integrated Natural Resource Management Plan, will help minimize these impacts. Additionally, the Army's use of existing facilities and control measures will further mitigate potential effects.
- **Human Health and Safety – Less than Significant**
  - *Impacts*: The fielding and stationing of the proposed weapons systems under the action alternatives have the potential to impact human health and safety. HP-DE weapons systems, including lasers and high-power microwaves, may pose an increased risk of hazardous conditions. However, the 2015 Environmental Assessment for Demonstrations of Various Electric Fires and Loitering Aerial Munition Systems at Fort Sill, Oklahoma concluded that these advanced systems would have no significant impact on human health and safety, both on-post and in surrounding areas, due to established safety protocols. Since then, Fort Sill has conducted dozens of demonstrations involving high-energy lasers, high-power microwaves, and other weapon systems without incident.
  - *Best Management Practice(s)*: The Army will prioritize mitigating potential health risks associated with high-power microwave technology by continuously reviewing the latest research. To safeguard soldiers and civilians, the Army will establish comprehensive SOPs, Safety Danger Zones, and BMPs. These measures, along with strict adherence to applicable regulations, will ensure the designation of clear safety zones around operational weaponry and radar systems to effectively prevent injuries.
- **Land Use – Less than Significant**
  - *Impacts*: The fielding and stationing of the proposed weapons systems under both action alternatives could affect land use at Fort Sill, depending on the storage locations and whether existing facilities are sufficient or new construction is needed. Specific details regarding weapons system storage are outside the scope of this PEA, and additional NEPA documentation may be required for a comprehensive analysis. Regarding training, the primary concern is not land availability but the potential for overlapping land uses. However, the existing training space is sufficient, and land use designations for training areas will remain unchanged.

- *Best Management Practice(s)*: Range Operations mitigate overlapping training uses through monthly and quarterly deconfliction meetings. Adequate consultation with Range Operations and Real Property Management ensures potential land use changes and increased training demands are effectively managed.

- **Utilities – Less than Significant**
  - *Impacts*: The fielding and stationing of weapons systems under both action alternatives are expected to have less than significant impacts on utilities. Under alternative 1, the HP-DE systems would have no impact, and while the accompanying 3.9 percent population increase associated with the IFPC may drive a minor increase in utility demand, existing capacities are sufficient. Similarly, under alternative 2, the weapons systems themselves would not impact utilities, and the population increase is expected to be accommodated by existing capacities at Fort Sill.
  - *Best Management Practice(s)*: The increase in population could increase utility demand and the construction of additional infrastructure may be necessary. Specific utility demand and infrastructure improvement requirements cannot be quantified until specific facility and housing requirements are known. Supplemental NEPA documentation may be required before beginning construction.
- **Water Resources – Less than Significant**
  - *Impacts:* The fielding and stationing of weapons systems under both action alternatives are expected to have minimal impacts on water resources. These alternatives may require additional infrastructure or expanded training areas, though details are unknown, and supplemental NEPA analysis could be necessary for new construction. While increased personnel and industrial activity could slightly elevate risks such as accidental spills, trash entering waterways, or activities within floodplains, these impacts are expected to be minor. Similarly, under alternative 2, a 4.1 percent population increase, and related training activities may slightly affect the watershed, water demand, and treatment systems. Increased vehicle washing would be managed through closed-loop systems, mitigating potential impacts. Overall, both alternatives are anticipated to result in less than significant effects on water resources.
  - *Best Management Practice(s):* Fort Sill employs robust measures to protect water resources and minimize impacts from training activities and construction. Spill containment and prevention measures outlined in the Spill Prevention, Control, and Countermeasures Plan, Installation Spill Contingency Plan, and Stormwater Management Plan prevent contaminants from reaching local aquifers. Training activities are coordinated with the Fort Sill Environmental Quality Division to avoid damage to wetlands, and modern oil-water separators, indoor repair practices, and secure storage facilities for hazardous materials further reduce risks.

    Floodplain impacts are minimized through adherence to Executive Order 11988, Floodplain Management requires the avoidance of floodplains when possible or, if unavoidable, adherence to specific elevation and design standards. Projects must also comply with Section 438 of the Energy Independence and Security Act, ensuring site hydrology is maintained or restored for federal projects exceeding

5,000 square feet. Additionally, Fort Sill mitigates training impacts through coordination with the Fort Sill Environmental Quality Division and the Integrated Training Area Management program to avoid sensitive areas. Implementation of these measures, along with BMPs and the Integrated Natural Resource Management Plan guidelines, ensures any impacts to water resources and floodplains remain less than significant.

## PUBLIC REVIEW AND INTERAGENCY COORDINATION

### Introduction

The PEA and Draft FONSI are available for public, agency, and tribal review for a 30-day period. A public Notice of Availability was published in local newspapers. Electronic copies of the PEA and Draft FONSI are available for download from the Fort Sill website at: https://sill-www.army.mil/usag/dpw/environmental/. Comments can be submitted by email at or by mail to richard.a.mcdaniel49.civ@army.mil or Richard McDaniel, NEPA Coordinator, Directorate of Public Works, Environmental Quality Division, Attn: AMIM-SIP-E (R. McDaniel), 2515 Ringgold Road, Fort Sill, OK 73503. If you have questions regarding these documents or the public comment process, please contact Mr. Richard McDaniel at richard.a.mcdaniel49.civ@army.mil.

To facilitate intergovernmental and interagency coordination of environmental planning (IICEP),Fort Cavazos also sent IICEP letters to government agencies and Native American Tribes requesting their review and input. These letters were sent to the State Historic Preservation Office, the U.S. Fish and Wildlife Service, the U.S. Environmental Protection Agency, the Federal Aviation Administration, and local Native American Tribes.

### Comments Received and Responses

*Any substantive comments will be summarized and added to the Final FONSI*.

## CONCLUSION

Based on a careful review of the PEA, comments received during the 30-day public notice comment period, as well as coordination with relevant parties through IICEP letters, the Army has determined that no significant direct, indirect, or reasonably foreseeable impacts to the human or natural environment are anticipated as a result of implementation of the proposed action. The Army concludes that the two action alternatives and no action alternative are not likely to have significant effects and that an environmental impact statement is not required and will not be prepared. This decision is based on the environmental and socioeconomic analysis contained in this PEA. This decision meets the requirements of NEPA and Army NEPA regulations and has been made after considering all submitted information and examining a full range of reasonable alternatives and all environmental impacts. This concludes the NEPA process for this action.

Derek R. Baird
Colonel, U.S. Army
Garrison Commander
Fort Sill, Oklahoma

Date

## FONSI APPENDIX A: SUMMARY OF THE EFFECTS FROM THE EVALUATED ALTERNATIVES

Summarized effects include direct, indirect, and reasonably foreseeable effects.

| Resource Area | Alternative 1 | Alternative 2 | No Action Alternative |
|---|---|---|---|
| **Air Quality** | Less than significant adverse effects | Less than significant adverse effects | None |
| **Biological Resources** | Less than significant adverse effects | Less than significant adverse effects | None |
| **Cultural Resources** | Less than significant adverse effects | Less than significant adverse effects | None |
| **Geological and Soil Resources** | Less than significant adverse effects | Less than significant adverse effects | None |
| **Human Health and Safety** | Less than significant adverse effects | Less than significant adverse effects | None |
| **Land Use** | Less than significant adverse effects | Less than significant adverse effects | None |
| **Utilities** | Less than significant beneficial effects | Less than significant beneficial effects | None |
| **Water Resources** | Less than significant adverse effects | Less than significant adverse effects | None |

## TABLE OF CONTENTS

## LIST OF FIGURES



## LIST OF TABLES

## ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| ADA | Air Defense Artillery |
| AIRFA | American Indian Religious Freedom Act |
| AMS | Army Modernization Strategy |
| APE | Area of potential effect |
| AR | Army Regulation |
| Army | U.S. Army |
| BMP | Best management practice |
| BN | Battalion |
| C&D | Construction and demolition |
| CFR | Code of Federal Regulations |
| CO | Carbon monoxide |
| C-sUAS | Counter-small Unmanned Aircraft Systems |
| DE | Directed Energy |
| DIVAD | Divisional Air Defense |
| DoD | United States Department of Defense |
| DOI | United States Department of Interior |
| DPW | Directorate of Public Works |
| EO | Executive Order |
| EQD | Fort Sill Environmental Quality Division |
| ESA | Endangered Species Act |
| FAB | Field Artillery Brigade |
| FCoE | Fires Center of Excellence |
| FONSI | Finding of No Significant Impact |
| FLPMA | The Federal Land Policy and Management Act |
| FY | Fiscal year |
| GHG | Greenhouse gas |
| HMMWV | High Mobility Multipurpose Wheeled Vehicle |
| HP-DE | High-Power – Directed Energy |
| IBCS | Integrated Air and Missile Defense Battle Command System |
| ICRMP | Integrated Cultural Resources Management Plan |
| IFPC | Indirect Fire Protection Capability |
| IFPC-HEL | Indirect Fire Protection Capability-High Energy Laser |
| IFPC-HPM | Indirect Fire Protection Capability-High-Power Microwave |
| Inc 2 | Increment 2 |
| INRMP | Integrated Natural Resources Management Plan |
| IPaC | Information for Planning and Consultation |
| ITAM | Integrated Training Area Management |
| Keeper | Keeper of the Register |
| $K_u$ | K-Under |
| kW | Kilowatt |
| LTAMDS | Lower Tier Air and Missile Defense Sensor |
| LRHW | Long-Range Hypersonic Weapon |
| MBTA | Migratory Bird Treaty Act |
| MDO | Multi-Domain Operations |
| MRC | Mid-Range Capability |
| M-SHORAD | Maneuver Short Range Air Defense Capability |
| MSW | Municipal solid waste |

| | |
|---|---|
| NAAQS | National Ambient Air Quality Standards |
| NAGPRA | Native American Graves Protection and Repatriation Act |
| NDS | National Defense Strategy |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| $NO_2$ | Nitrogen dioxide |
| NPDES | National Pollutant Discharge Elimination System |
| NRCS | Natural Resources Conservation Service |
| NRHP | National Register of Historic Places |
| ONHI | Oklahoma Natural Heritage Inventory |
| OWRB | Oklahoma Water Resource Board |
| PATRIOT | Phased Array Tracking Radar to Intercept on Target |
| PEA | Programmatic Environmental Assessment |
| $PM_{2.5}$ | Particulate matter with a diameter less than or equal to 2.5 microns |
| $PM_{10}$ | Particulate matter with a diameter less than or equal to 10 microns |
| PSO | Public Service Company of Oklahoma |
| RCRA | Resource Conservation and Recovery Act |
| ROI | Region of Influence |
| SDZ | Surface Danger Zones |
| $SO_2$ | Sulfur dioxide |
| SOP | Standard Operating Procedure |
| SGT STOUT | Formerly Maneuver Short Range Air Defense Capability (M-SHORAD) |
| UAS | Unmanned Aircraft Systems |
| U.S. | United States |
| USC | United States Code |
| USEPA | United States Environmental Protection Agency |
| USFWS | United States Fish and Wildlife Service |
| WMWR | Wichita Mountains National Wildlife Refuge |

# 1 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

## 1.1 Introduction

This Programmatic Environmental Assessment (PEA) evaluates the potential environmental effects that could result from the stationing[1], fielding[2], operations, and maintenance of up to five weapons systems in combinations described in the three action alternatives at Fort Sill, Oklahoma.

The 2022 National Defense Strategy (NDS) outlines strategic objectives and priorities of the United States (U.S.) military in addressing emerging threats and challenges. The NDS identifies four overarching defense priorities that the Department of Defense (DoD) must pursue to strengthen deterrence. First, to defend the homeland. Second, it seeks to deter strategic attacks against the U.S., our allies, and our partners. Third, it focuses on deterring aggression and preparing to prevail in conflict when necessary. Lastly, it aims to secure the future military advantage of the U.S. by developing a resilient Joint Force and defense ecosystem (DoD, 2022).

The U.S. Army (Army) Modernization Strategy (AMS), introduced in 2019 and updated in 2021, aligns with the 2022 NDS and delineates how the Army will transform into a multi-domain force by 2035. The ultimate objective of the AMS is to have a modernized Army capable of conducting Multi-Domain Operations (MDO) as part of an integrated Joint Force in one major action by 2028 and to be prepared to conduct MDO in various scenarios across multiple threats by 2035. The MDO concept describes how the Army will support the Joint Force by rapidly and continuously integrating all domains of warfare – land, sea, air, space, and cyberspace – to deter and prevail if deterrence fails. This transformation is crucial for fulfilling the Army's enduring responsibility as part of the Joint Force, which encompasses all U.S. and allied military forces, to ensure the defense of the U.S. and maintain its position as the globally dominant land power. To prepare for the battlefield of the future, the Army must be ready to fight in a very different operational environment from any previously fought wars. The character of war has changed significantly, and the Army along with its joint service partners, must be ready to deploy and fight in a high-intensity, MDO environment. (U.S. Army, 2021).

The AMS establishes six modernization priorities to rebuild readiness and modernize the force:

- Long Range Precision Fires,
- Next Generation Combat Vehicles,
- Future Vertical Lift,
- Network Technology,
- Air and Missile Defense, and
- Soldier Lethality.

[1] Stationing is the process of combining force structure and physical capabilities at a specific location to satisfy a specific mission requirement. Stationing includes a force structure component and a facility component.

[2] Fielding refers to sending new equipment and technology to an installation. As part of a fielding action, soldiers are stationed at an installation to train and maintain the weapon system capability.

The Army, in support of the AMS, is considering the stationing, fielding, operations, and maintenance of the following five weapons systems at Fort Sill:

1. Long-Range Hypersonic Weapon (LRHW) System
2. Mid-Range Capability (MRC) System
3. Indirect Fire Protection Capability (IFPC)
4. High-Power – Directed Energy (HP-DE) Systems
5. Lower Tier Air and Missile Defense Sensor (LTAMDS)

Fielding these systems would enhance the Army's capability to defeat advanced and future threats, provide new capabilities to Fort Sill soldiers, and integrate with new and existing systems.

This PEA has been prepared to fulfill the requirements of the National Environmental Policy Act (NEPA) (42 U.S. Code [USC] 4321 et seq.) and the Army's NEPA implementation procedures, as outlined in 32 Code of Federal Regulations (CFR) 651, Army Regulation (AR) 200-2 *Environmental Analysis of Army* Environmental Analysis of Army Actions (U.S. Army, 2002), and applicable Army policy (U.S. Army, 2017).

### 1.1.1 Background

Fort Sill is a medium-sized installation with a total population of approximately 53,000, including 20,000 military and civilian personnel and 33,000 military family members. Fort Sill covers approximately 150 square miles of Comanche County, Oklahoma, and is located approximately 90 miles southwest of Oklahoma City and approximately 50 miles north of Wichita Falls, Texas (Figure 1-1). The City of Lawton borders Fort Sill on the southeast, and the City of Cache borders the installation to the southwest. The principal cantonment area is bordered by Highway 62 to the south, while east and west Fort Sill are bisected by Interstate 44 (DoD, 2024).

Fort Sill extends approximately 27 miles in an east-west direction and approximately four to nine miles in a north-south direction, depending on location. Fort Sill encompasses approximately 93,679 total acres, composed of approximately 7,066 acres of cantonment area (military quarters), approximately 85,985 acres of training lands, and approximately 628 acres dedicated to open space and other ancillary uses (Figure 1-2). The mission of the Fires Center of Excellence (FCoE) and Fort Sill is to train, educate, deliver, and lead an elite, combat-ready Fires Warfighting Force, while strengthening the profession, leading continuous transformation, providing fires readiness to combined, joint, and multinational forces worldwide and to engage, collaborate, and partner with stakeholders. Fort Sill's enduring priorities include taking care of people, warfighting, delivering combat-ready formations, continuous transformation, and strengthening the Army Profession (Fort Sill, 2020a).

Fort Sill is the home to the FCoE. The FCoE creates the world's premier Fires Force; ready to employ responsive, cross-domain fires to win in any operational environment. The FCoE is an organization that combines the U.S. Army Field Artillery Center and School and the U.S. Army Air Defense Artillery (ADA) Center and School. Principal operational force units at Fort Sill include: 75th Field Artillery Brigade (FAB), 31st Air Defense Artillery Brigade, and 4-60th ADA Battalion. The primary generating force units are: 434th FAB, 428th FAB, 30th ADA Brigade,

and 45th Oklahoma National Guard units. Fort Sill is also one of the five locations for Army Basic Combat Training and hosts numerous tenant organizations not directly headquartered on the installation.

**Figure 1-1: Vicinity Map**

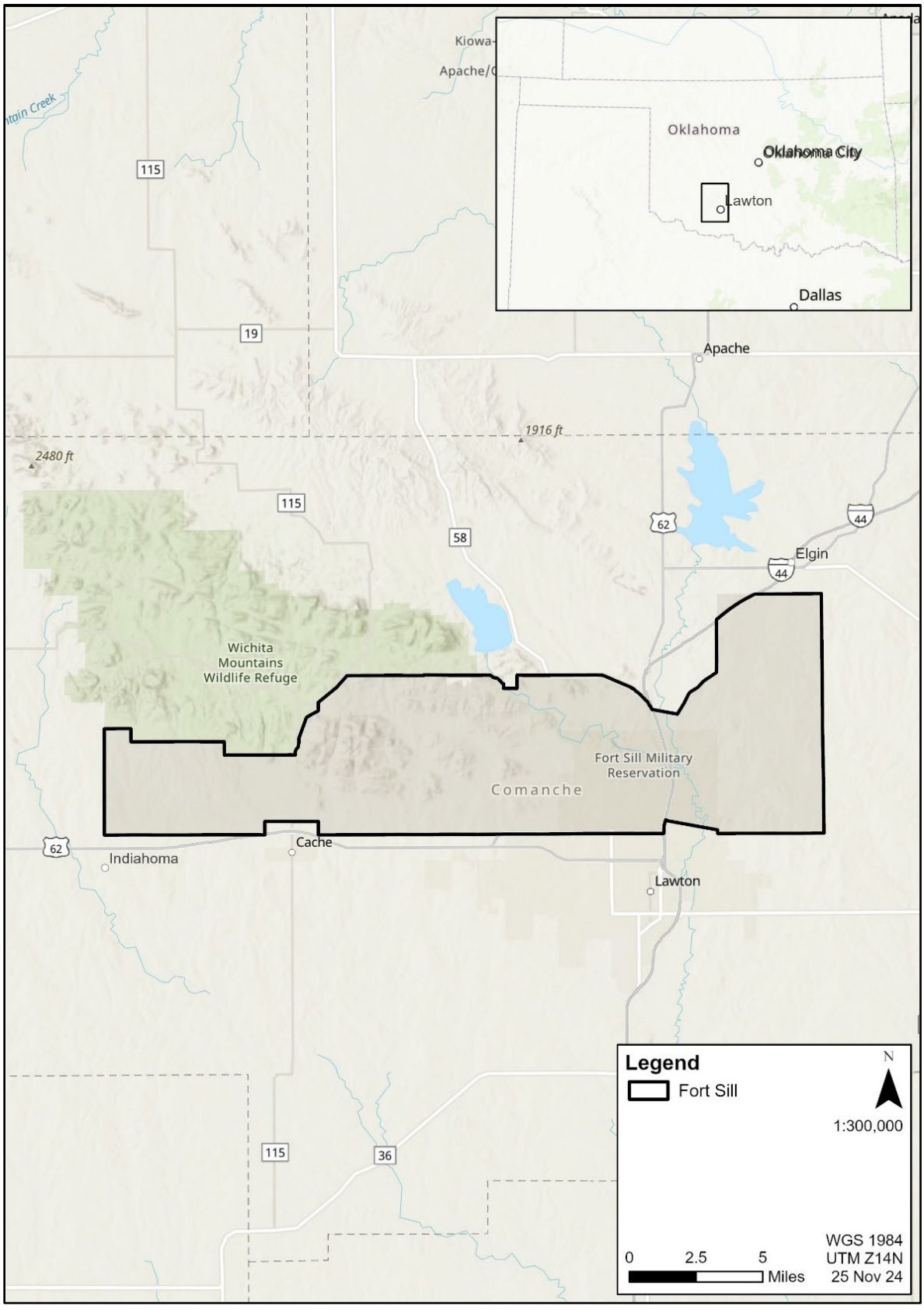
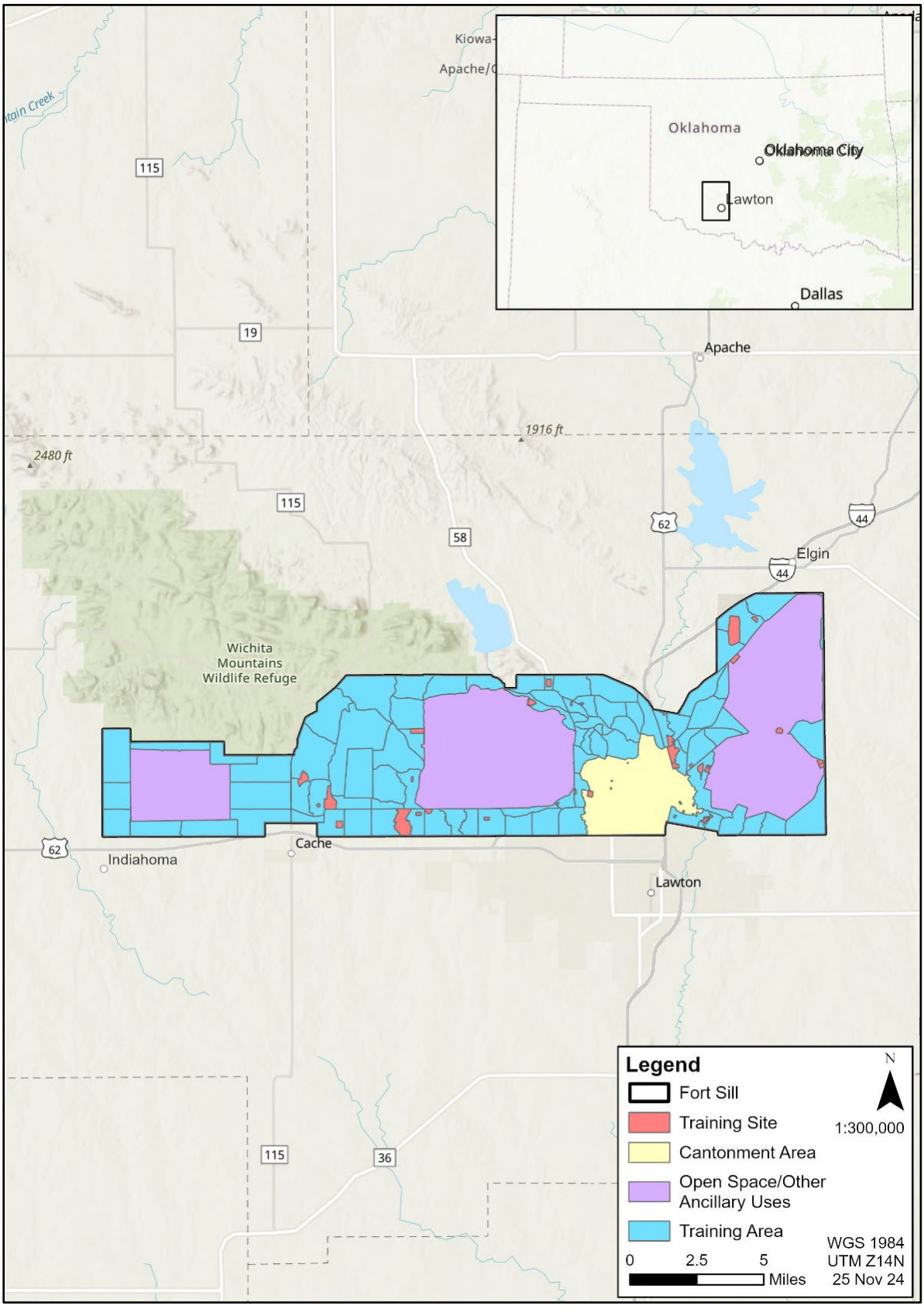


**Figure 1-2: Project Area**



### 1.1.2 Weapons Systems

The following sections provide general descriptions of each of the five weapons systems analyzed in this PEA.

#### 1.1.2.1 Long Range Hypersonic Weapon

The LRHW system is a strategic attack weapon system designed to counter Anti-Access/Area Denial capabilities, mitigate adversary long-range fires, and effectively engage high-value and time sensitive targets.

A LRHW Battery includes a mobile battery operations center comprised of one Family of Medium Tactical Vehicles mounted Battery Operations Center, four LRHW Transporter Erector Launchers mounted on four modified M870A4 tri-axle trailers with two Environmental Control Units and two generators per trailer, four primary movers (M983A4 Light Equipment Transporter tractors), one rough terrain container handler, and one high mobility multipurpose wheeled vehicle (HMMWV) with trailer. Tactical munitions for the LRHW comprise All Up Rounds + Canisters. Weighted and empty training canisters and canister-mounted emulators would also be received for use in training exercises. These munitions would be stored in earth-covered magazines at the ammunition supply point at the installation. A Transporter Erector Launcher and Light Equipment Transporter are shown on Figure 1-3.

**Figure 1-3: LRHW System**

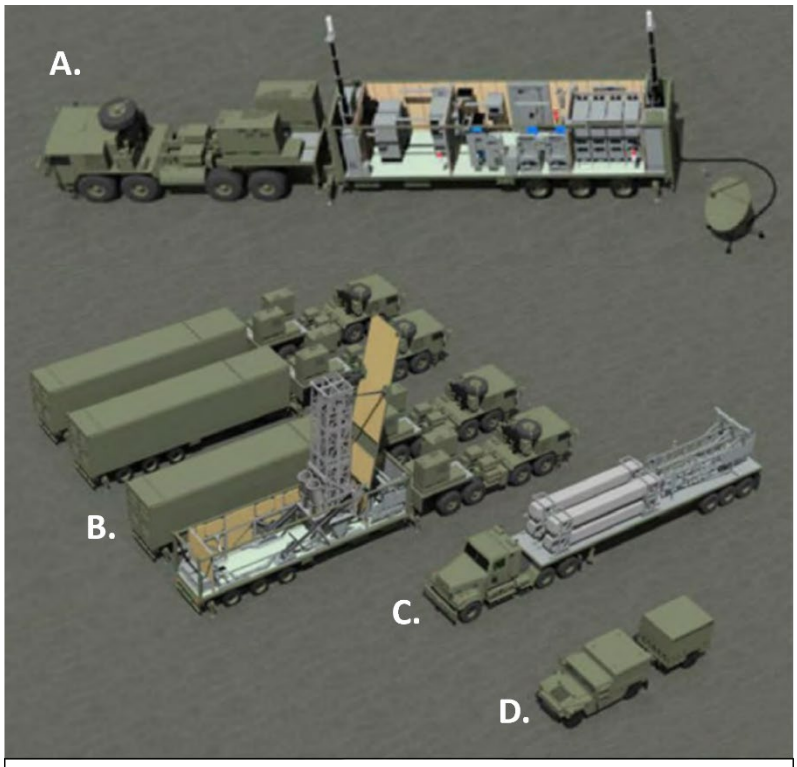
The Army is considering the fielding, stationing, operations, and maintenance of the LRHW at Fort Sill as part of the 2021 AMS in fiscal year (FY) 2027 or later, as analyzed in this PEA. Each LRHW Battery is supported by two firing Platoons and one Headquarters Platoon. The LRHW Battery includes a Headquarters Section, two Firing Platoons, and a Field Support Platoon. The Headquarters Platoon provides administrative support, an operations center, and a Field Support Platoon for sustainment. The system is transportable between locations by an Air Force C-17 aircraft and be road-mobile for transport on base/installations. Approximately 60-90 soldiers are required to oversee LRHW maintenance, operations, and training. Using the upper limit, the soldiers include an estimated 122 family members (including spouses and children). The system would be housed in existing infrastructure or new infrastructure would be provided prior to fielding the LRHW. Supplemental NEPA documentation may be required before beginning construction.

#### 1.1.2.2 Mid-Range Capability Weapon System

The MRC Battery is a component of the Strategic Fires Battalion (BN) and provides mid-range missile capabilities that allow the Army to respond against peer adversaries in a more challenging environment and can be fielded individually or be incorporated into a Multi-Domain Task Force under the long-range precision fires modernization effort. The MRC can utilize and modify existing hardware and software from the Army and joint service partners and integrate additional technologies to achieve new operational effects.

The MRC Battery, shown on Figure 1-4, consists of four trailer-mounted, multipurpose launchers on M983A4 Prime Movers that each hold four missiles, for a total of 16 missiles per battery. MRC munitions would be stored in earth-covered magazines at the ammunition supply point at the installation. The Battery Operations Center support vehicles are expected to be comprised of one Command and Control vehicle with shelter, one trailer-mounted generator, and two M1152A2 HMMWVs. The Field Support Platoon contains a supply section and two ammunition sections with eight associated vehicles.

**Figure 1-4: MRC Weapon System**




A. Trailer Mounted BOC with installed C2 systems and generator towed by an M983A4 prime mover
B. Trailer-mounted MRC launchers towed by M983A3 prime movers
C. Reload Trailer with MHE
D. HMMWV Battery Support Vehicle

Legend: BOC=Battery Operations Center, C2=Command and Control, MRC=Mid-Range Capability, MHE=Materials Handling Equipment, HMMWV=High Mobility Multipurpose Wheeled Vehicle

The Army is considering the fielding, stationing, operations, and maintenance of the MRC Weapon System at Fort Sill as part of the 2021 AMS in the FY 2028 to FY 2029 timeframe, as analyzed in this PEA. Approximately 70-100 soldiers are required to oversee MRC maintenance, operations, and training. Using the upper limit, the new soldiers include an estimated 135 family members (including spouses and children). The system would be housed in existing infrastructure or new infrastructure would be provided prior to fielding the MRC. Supplemental NEPA documentation may be required before beginning construction.

#### 1.1.2.3 Indirect Fire Protection Capability

The IFPC, as shown on Figure 1-5, provides defense against cruise missiles, rockets, and unmanned aircraft systems (UAS[3]) to fixed and semi-fixed sites such as an airfield or forward operation base.

[3]The term "UAS" can refer to unmanned or uncrewed aircraft systems. The terms "unmanned" and "uncrewed" are used interchangeably and do not alter the overall definition or meaning of UAS.

**Figure 1-5: IFPC Weapon System**

The IFPC BN structure includes Headquarters and Headquarters Battery, a Forward Support Company, three IFPC Batteries, and a Counter small Unmanned Aerial Systems (C-sUAS) Battery. The Headquarters and Headquarters Battery provides command, administrative, intelligence, and medical support to the BN. The Forward Support Company provides maintenance, logistics, and sustainment for all fielded systems, equipment, and personnel of the BN.

The IFPC Battery is organized similar to current ADA Batteries, consisting of a small Headquarters Platoon, a Launcher Platoon, a Fire Control/Radar Platoon, and a system support section. The IFPC BN and Batteries may initially field with kinetic weapons in a missile and launcher configuration, similar to the Phased Array Tracking Radar to Intercept on Target (PATRIOT) system. Primary mission equipment in each IFPC Battery includes an Engagement Operations Center equipped with the Army Integrated Air and Missile Defense Battle Command System for command and control; a Sentinel radar for search, tracking, and targeting; and launcher/interceptors in an All-Up-Round Magazine configuration (shown on Figure 1-5) firing the AIM-9X Sidewinder missile. Alternate IFPC configurations may include directed energy (DE) effectors such as high-energy lasers and high-power microwaves. The DE effectors are the subject of a separate assessment, see Section 1.1.2.4.

The C-sUAS Battery provides better protection of assets against a rapidly emerging small UAS threat. The C-sUAS Battery is organized with a Headquarters Platoon, and teams to operate the systems fielded. Each C-sUAS Battery is capable of operating multiple systems that can detect, track, identify, and defeat small UAS by non-kinetic (electromagnetic) or kinetic (guns/missiles) effectors. Systems can be fixed site or mobile (mounted or dismounted) to cover the spectrum of threats. In addition to the primary equipment of the IFPC and C-sUAS Batteries, the BN fields with 100 joint light tactical vehicles or HMMWVs, 190 medium tactical vehicles, and 140 trailers to transport personnel and equipment. Tracked vehicles are not expected to field with the IFPC BN. To facilitate operation, storage, and maintenance of all systems, an array of individual

weapons, sensors, and communications equipment would be fielded. The types of equipment and approximate quantities that are fielded with the IFPC BN are shown in Table 1-1.

**Table 1-1: Approximate Quantity of Anticipated Equipment for IFPC and C-sUAS per BNs**

| *Equipment Type* | *IFPC Battery Only* | *IFPC BN with C-sUAS* |
|---|---|---|
| JLTV & HMMWV | 20 | 100 |
| Trucks, Vans, & MTV | 25 | 190 |
| Trailers | 30 | 140 |
| Generators | 35 | 165 |
| Radars | 5 | 25 |
| Kinetic Launchers | 15 | 50 |

Legend: IFPC=Indirect Fire Protection Capability; BN=Battalion; C-sUAS=Counter-small Unmanned Aircraft Systems; JLTV=Joint Light Tactical Vehicle; HMMWV=High Mobility Multipurpose Wheeled Vehicles; MTV=Medium Tactical Vehicle

The Army is considering the fielding, stationing, operations, and maintenance of an IFPC BN at Fort Sill as part of the 2021 AMS in FY 2028 or later, as analyzed in this PEA. The total personnel associated with an IFPC BN would be approximately 735. The new soldiers include an estimated 992 family members (including spouses and children). The system would be housed in existing infrastructure or new infrastructure would be provided prior to fielding the IFPC BN. Supplemental NEPA documentation may be required before beginning construction.

#### 1.1.2.4 High-Power-Directed Energy

The HP-DE systems are comprised of the IFPC-High-Energy Laser (IFPC-HEL), IFPC-High-Power Microwave (IFPC-HPM), and the M-SHORAD Increment 2 (Inc 2) (DE). Future IFPC capabilities may feature two IFPC configurations: one equipped with a 300-kW laser system and another with a microwave system. The IFPC-HEL and IFPC-HPM are collectively referred to as IFPC-DE systems. Additionally, the M-SHORAD Inc 2 (DE) incorporates a 50-kW laser integrated into the SGT STOUT[4] system, replacing its kinetic weapons to create the M-SHORAD Inc 2 (DE).

The IFPC DE may field with an IFPC BN or Battery. Each IFPC Battery consists of a Headquarters Platoon; a Fire Control Platoon with a Headquarters Section, Operations Section, and Sensor Section; and a Firing Platoon with a Headquarters Section, and one or more Firing Sections. Within an IFPC Battery fielding HP-DE weapons, there could be either three Platoons – two IFPC Kinetic Platoons and one IFPC DE Platoon or four Platoons – two IFPC Kinetic Platoons, one IFPC-HEL Platoon, and one IFPC-HPM Platoon.

The IFPC-HEL, shown on Figure 1-6, is a truck-mounted, 300-kW laser that protects against rocket, artillery, mortar fire, UAS, fixed and rotary wing aircraft, and subsonic cruise missile threats. The system is intended to be interoperable with the Integrated Air and Missile Defense Battle Command System (IBCS). It is planned to be mounted on existing Palletized Load Systems on a Heavy Expanded Mobility Tracker Truck as the prime mover. Its primary objective

[4] As of June 15, 2024, the kinetic M-SHORAD was formally redesignated the SGT STOUT in honor of Sgt. Mitchell W. Stout, the only Air Defense Artillery Soldier to receive the Medal of Honor. The DE variant was not included in the name change and remains the M-SHORAD Inc 2 (DE).

is to protect soldiers, allies, equipment, and buildings/facilities by denying, degrading, damaging, or destroying aerial threats by the heating action of the laser.

**Figure 1-6: IFPC-HEL Tactical Vehicle**

The IFPC-HPM, shown on Figure 1-7, is a ground-based system that can be loaded onto available trailers or other load-handling vehicles and use a variety of prime movers for mobility purposes. It has a primary objective of protecting soldiers, allies, equipment, and buildings/facilities by denying, degrading, damaging, or destroying the sensitive electronics of an adversary threat. The IFPC-HPM provides defense from UAS (particularly groups and swarms) by sending out an electromagnetic pulse to disable/destroy electrical components of threat equipment. The IFPC-HPM is planned to be operable with IBCS prior to fielding.

**Figure 1-7: IFPC-HPM**

The M-SHORAD Inc 2 (DE)would mount a 50-kW laser, $K_u$ (K-Under) band radar and Forward Area Air Defense Command and Control systems on one or more Army tactical platforms to enable air defense engagements. The system may be palletized to allow use of multiple platforms such as the Joint Light Tactical Vehicle, Infantry Squad Vehicle, and the Stryker, as shown in Figure 1-8. It is designed to maneuver with and provide air defense against rocket, artillery, mortar, UAS, and cruise missile threats for Armor or Stryker Brigade Combat Team assets and the M10 Booker supporting infantry units. The M-SHORAD Inc 2 (DE) would field to the Divisional Air Defense (DIVAD) BN and replace the kinetically armed vehicles. No growth in personnel would be expected. The M-SHORAD Inc 2 (DE) may require a crane and “clean room” facilities that are not required of the kinetic SGT STOUT. Supplemental NEPA assessment may be required prior to any desired military construction including stated “clean room” facilities.

**Figure 1-8: M-SHORAD Inc 2 (DE) Vehicle**

The Army is considering the fielding, stationing, operation, and maintenance of the IFPC DE within the IFPC BN or Battery at Fort Sill as part of the 2021 AMS in FY 2027 or later. The IFPC-HEL or IFPC-HPM Platoon soldiers would transition from IFPC kinetic energy systems to the IFPC-HEL or IFPC-HPM; therefore, no additional personnel would be required above those presented for the IFPC in Section 1.1.2.3. The M-SHORAD Inc 2 (DE) soldiers would transition from the SGT STOUT and no growth is expected for the DIVAD BN.

#### 1.1.2.5 Lower Tier Air and Missile Defense Sensor

The LTAMDS, as shown on Figure 1-9, is a 360-degree active electronically scanned array radar with improved power and sensitivity. The sensor is designed to detect and track cruise and ballistic missiles, aircraft, and UASs, and it would integrate with the IBCS, the Army's air and missile defense network backbone designed to link air and missile defense assets on the battlefield.

**Figure 1-9: LTAMDS Weapon System**


The Army is considering the fielding, stationing, operations, and maintenance of the LTAMDS at Fort Sill as part of the 2021 AMS in FY 2026 or later, as analyzed in this PEA. The LTAMDS radar would be a crucial component of the Army's future integrated air and missile defense architecture.

The LTAMDS would be a one-for-one replacement for the current PATRIOT AN/MPQ-65 radar, which is currently stationed at Fort Sill. The LTAMDS is somewhat larger and heavier than the PATRIOT AN/MPQ-65, and it also operates at different frequencies and power levels. There would be no increase in personnel or new facilities required to field and operate the LTAMDS as compared to the PATRIOT AN/MPQ-65. If the existing facilities are not adequate for the LTAMDS new infrastructure would be provided prior to fielding, for which supplemental NEPA documentation may be required. The LTAMDS would be accompanied by a new electrical power supply that would replace the current PATRIOT AN/MPQ-65 electrical power supply on a one-for-one basis. Both power supplies are trailer mounted and similar in physical dimensions.

### 1.1.3 Personnel Required for Weapons Systems

Table 1-2 shows the estimated personnel required for each proposed weapon system and the estimated accompanying family members. Estimations were calculated using 1.35 dependents per soldier ratio[5]. To provide context to the scope of the potential population increase in population at Fort Sill, the current (FY 2024) total installation population is approximately 53,000

[5] The 1.35 dependents per soldier ratio used in this analysis is a conservative estimate based on active-duty family demographic data. According to Military OneSource (https://demographics.militaryonesource.mil/chapter-5-active-duty-families), the total number of family members divided by the total number of active-duty soldiers yields approximately 1.33 dependents per soldier. The use of 1.35 ensures a cautious and comprehensive approach to account for potential variations in dependent populations.

including approximately 20,000 military and civilian personnel and 33,000 military family members.

**Table 1-2: Estimated Personnel Required for the Proposed Weapons Systems**

| *Weapon System* | *Approximate Required Personnel* | *Approximate Family Members* to Accompany Required Personnel* | *Total Potential Increase to Installation Population** |
|---|---|---|---|
| LRHW | 60-90 | 122 | 212 |
| MRC | 70-100 | 135 | 235 |
| IFPC | 735 | 992 | 1,727 |
| HP-DE | N/A (part of IFPC BN and/or DIVAD BN) | N/A (part of IFPC BN and/or DIVAD BN) | N/A (part of IFPC BN and/or DIVAD BN) |
| LTAMDS | N/A (would field to a PATRIOT unit) | N/A (would field to a PATRIOT unit) | N/A (would field to a PATRIOT unit) |
| **Total** | **865-925** | **1,249** | **2,174** |

Legend: LTAMDS=Lower Tier Air and Missile Defense Sensor, IFPC=Indirect Fire Protection Capability, LRHW=Long-Range Hypersonic Weapon, MRC=Mid-Range Capability, HP-DE=High-Power – Directed Energy, N/A=not applicable, DIVAD=Divisional Air Defense, BN=Battalion, PATRIOT=Phased Array Tracking Radar to Intercept on Target

Notes: *Family members include spouses and children. If the personnel increase is a range, the upper value was used to calculate the accompanying family members.

**Personnel for some weapons systems could be drawn from existing personnel. The total potential increase to installation population reflects the potential upper limit for personnel and families.

At Fort Sill, soldiers and their families would reside in barracks, on-post housing, or in nearby communities. Soldiers and their families would utilize facilities, shopping, and support services on post and in the local community in a manner like civilian residents, providing economic benefit to the community.

## 1.2 Purpose and Need

The purpose of the proposed action is to enhance the Army's ability to address evolving and advanced threats from near-peer adversaries by strategically stationing, fielding, operating and maintaining a suite of advanced weapons systems at Fort Sill. This initiative aims to improve the readiness and capabilities of Fort Sill and its soldiers, ensuring they have access to state-of-the-art equipment to effectively protect national security interests, and train the Army’s future soldiers on these weapons systems.

The need for the proposed action is for Army forces to have access to cutting-edge equipment and weapons systems in order to meet or exceed the advancing capabilities of our nation's adversaries, and train the Army’s future soldiers on these weapons systems. This action is essential to enhance soldier safety, lethality, and mission success; maintain global deploy-ability; and ensure seamless integration with existing and emerging technologies, all of which are crucial for safeguarding the nation and its interests.

## 1.3 Scope of the Environmental Analysis

This PEA considers the potential impacts of the proposed action and alternatives on the potentially affected environment and the degree of the effects or impacts of the action. Effects or

impacts mean changes to the human and natural environment from the proposed action or alternatives that are reasonably foreseeable and include the following :

1. Direct effects, which are caused by the action and occur at the same time and place.
2. Indirect effects, which are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable.
3. Reasonably foreseeable effects, which are effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (federal or non-federal) or person undertakes such other actions.

The scope of the environmental review for this PEA is the stationing, fielding, operations, and maintenance of five weapons systems throughout the Fort Sill installation. This PEA includes a broad, programmatic analysis that examines the potential direct, indirect, and reasonably foreseeable environmental and socioeconomic impacts that could result from the overall stationing, fielding, operations, and maintenance of various weapons systems at Fort Sill. The programmatic approach is designed to allow for early planning, coordination, and flexibility throughout the fielding, stationing, operations, and maintenance of the various weapons systems at Fort Sill. This PEA is expected to contain some level of non-location-specific analysis of weapons systems. This PEA analysis serves to facilitate (1) Department of the Army Headquarters fielding decisions, specifically regarding the fielding location (“where”), by taking into account anticipated environmental impacts; and (2) to enable informed decisions regarding the implementation of selected weapons systems – including the methods (“how”) and specific locations (“where”) for fielding – based on anticipated environmental impacts.

In pursuit of the AMS, the Army has completed PEAs that examined the stationing of some of the weapons systems that are analyzed in this PEA. These PEAs analyzed singular weapon systems and evaluated a variety of Army installations with the goal of determining which installations are best suited to receive the weapons systems.

Although some weapons systems analyzed in this PEA may be analyzed under other Army actions, this PEA serves to examine the potential environmental impacts associated with the proposed fielding, stationing, operations, and maintenance of various combinations of weapons systems at Fort Sill over a short period of a few years.

Specific environmental resource areas analyzed in detail within this PEA include air quality, biological resources; cultural resources; geological and soil resources; human health and safety; land use; utilities; and water resources. The resources that are anticipated to have less than significant or negligible impacts, such as airspace, electromagnetic spectrum, hazardous and toxic materials and waste, noise, socioeconomics, and transportation and traffic, are briefly described but dismissed from detailed analysis (see Table 3-1).

As this environmental analysis is programmatic in nature, it uses existing survey data (e.g., existing biological, cultural, noise, and geological surveys).

## 1.4 Public and Agency Involvement

To facilitate the analysis and the decision-making process, the Army maintains a policy of open communication with interested parties and invites public participation. The Army urges all federal and state agencies, public and private organizations, and members of the public that have a potential interest in the proposed action, including minority, low-income, disadvantaged, and Native American Tribes to participate in the Army's NEPA and decision-making processes, as guided by the Army NEPA regulation 32 CFR Part 651.

The PEA and Draft Finding of No Significant Impact (FONSI) will be made available to federal, state, and local agencies, Native American Tribes, and the public for review and comment for a 30-day period. Fort Sill will publish a Notice of Availability for the PEA and Draft FONSI in the following newspaper:

- Lawton Constitution

Fort Sill will also make the PEA and Draft FONSI available for online viewing at https://sill-www.army.mil/usag/dpw/environmental/ and at the following libraries:

- Lawton: Lawton Public Library, 110 SW 4th St, Lawton, OK, 73501; and
- Fort Sill: Nye Library, 1640 Randolph Rd, Fort Sill, OK, 73503.

Following the 30-day review period, the Army will address all relevant comments received in the Final FONSI.

## 1.5 Decision(s) to be Made

The Army's decision is whether or not to implement the proposed action or the no action alternative. If no significant environmental effects are determined based on the evaluation of impacts, or if potentially significant impacts are identified and the proposed action can be modified or mitigated to a level of no significant impact, a FONSI will be signed by the decision-maker, the Fort Sill Garrison Commander. If the impact cannot be reduced to less than significant, or if new information warrants the need for supplemental analysis of potentially significant environmental impacts, the Army may initiate a Notice of Intent to prepare an Environmental Impact Statement. Future NEPA analyses conducted as necessary, will tier off this PEA, to examine site-specific actions related to the proposed action and alternatives addressed in this PEA.

In summation, there are three possible results following the conclusion of this programmatic analysis. An issuance of a FONSI for use by Army leadership in deciding specific staging and storage locations for proposed weapons systems, a Notice of Intent for further analysis with an Environmental Impact Statement if necessary, or it is possible that Army command will not move forward, and no new weapons systems will be stationed at Fort Sill.

# 2 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This chapter describes the proposed action and the alternatives. Additionally, this chapter provides the screening criteria used by the Army to develop the range of considered alternatives.

This PEA analyzes three alternatives, including the no action alternative and two action alternatives.

## 2.1 Proposed Action

The proposed action is to field and station up to five weapons systems at Fort Sill, enabling the Army to function as a multi-domain force. The Army determined that two alternatives meet all six of the screening criteria described in Section 2.2 below.

## 2.2 Screening Criteria

The following screening criteria have been established to identify alternatives that would meet the purpose and need for the action. To be considered a reasonable alternative, a potential alternative must meet the following six screening criteria:

1. **Presence of Supported or Supporting Units or Mission** – Installations must have a supporting unit present or provide initial or collective training for the different modernization systems.
2. **Required Training Lands** – Installations must have adequate space in their training lands to support the minimum requirements for emplacement, operation, and training for HP-DE, IFPC, LRHW, MRC, and LTAMDS, as designated in the Army Training Doctrine.
3. **Live-Fire Capability** – Installations must have or have access to adequate live-fire ranges to support the minimum requirements for the HP-DE training as designated in Training Circular 25-8 as a primary or alternate range type and system specific gunnery tables, or the capability to simulate live-fire.
4. **Airspace and Airfield Capacity** – Installations must have adequate restricted airspace, both laterally and vertically that overlies Army training lands to contain activities dangerous to non-participating aircraft and allow realistic target maneuver. Airfield capacity must be sufficient to support aircraft operations for training, logistics, and deployment of systems as required.
5. **Installation Support Infrastructure** – Installations must either (1) have adequate infrastructure and cantonment area facilities for administrative, maintenance, motor pool, housing, and personnel support; or (2) have the space, funding, and ability to provide adequate installation and/or cantonment area facilities by the fielding deadline. Note that facilities with a waiver are considered adequate to meet the requirement.
6. **Local Economy Support Infrastructure** – Local economy and surrounding communities must have adequate infrastructure and area facilities for housing, childcare, and schools to support soldiers and families living off post.

## 2.3 No Action Alternative

The no action alternative refers to the continuation of existing conditions without implementation of the proposed action. Implementation of the no action alternative would mean that none of the proposed weapons systems would be fielded or stationed at Fort Sill. Under the no action alternative, the Army would not enhance its structural MDO capabilities. Although implementation of the no action alternative would not meet the purpose and need, or the objectives of the AMS, the no action alternative serves as the baseline for the comparison of potential impacts to all resource areas.

## 2.4 Alternative 1

Alternative 1 includes the fielding, stationing, operations, and maintenance of the IFPC and the HP-DE weapons systems along with their respective equipment and associated soldiers to Fort Sill. Alternative 1 meets all six of the screening criteria described in Section 2.2.

The fielding, stationing, operations, and maintenance of the IFPC and HP-DE weapons systems involves the support of approximately 735 soldiers. An estimated 1,304 family members, including spouses and children, might accompany the soldiers. This could result in an overall increase of 2,039 to the Fort Sill population.

## 2.5 Alternative 2

Alternative 2 includes the fielding, stationing, operations, and maintenance of the LRHW, MRC, IFPC, HP-DE, and LTAMDS weapons systems along with their respective equipment and associated soldiers to Fort Sill. Alternative 2 meets all six of the screening criteria described in Section 2.2.

The fielding, stationing, operations, and maintenance of the LRHW, MRC, IFPC, HP-DE, and LTAMDS weapons systems would require the support of approximately 865 to 925 soldiers. Using the upper limit of anticipated soldiers, an estimated 1,249 family members, including spouses and children, might accompany the soldiers. This could result in an overall increase of 2,174 people to the Fort Sill population.

## 2.6 Alternatives Summary

Table 2-1 shows the different combinations of proposed weapons systems for each alternative.

**Table 2-1: Proposed Weapons Systems for Each Alternative**

| *Weapons Systems:* | *Alternative 1* | *Alternative 2* | *No Action Alternative* |
|---|---|---|---|
| LRHW | | X | |
| MRC | | X | |
| IFPC | X | X | |
| HP-DE | X | X | |
| LTAMDS | | X | |

Legend: LTAMDS=Lower Tier Air and Missile Defense Sensor, IFPC=Indirect Fire Protection Capability, LRHW=Long-Range Hypersonic Weapon, MRC=Mid-Range Capability, HP-DE=High-Power – Directed Energy

### 2.6.1 Planned Fielding Timeframes

Table 2-2 shows tentative fielding dates for the proposed weapons systems at Fort Sill.

**Table 2-2: Tentative Fielding Timeframes for the Proposed Weapons Systems**

| *Weapon System* | *Current Planned Fielding Dates** |
|---|---|
| LRHW | Q4 FY27 |
| MRC | Q2 FY28-Q2 FY29 |
| IFPC | Q1 FY28 |
| HP-DE | FY27 or later |
| LTAMDS | Q2 FY26 |

Legend: LRHW=Long-Range Hypersonic Weapon, MRC=Mid-Range Capability, IFPC=Indirect Fire Protection Capability, HP-DE=High-Power – Directed Energy, LTAMDS=Lower Tier Air and Missile Defense Sensor, IFPC-HPM=Indirect Fire Protection Capability-High-Power Microwave, IFPC-HEL=Indirect Fire Protection-High Energy Laser, Q1=Quarter One, Q4=Quarter Four, Q2=Quarter Two, Q3=Quarter Three, FY=Fiscal Year
Note: *These dates are preliminary and may be subject to change due to unforeseen circumstances and/or budgetary constraints.

## 2.7 Alternatives Not Carried Forward for Evaluation

In accordance with NEPA, the Army's comprehensive evaluation process involved a preliminary nationwide assessment of Army installations to identify potential sites for basing various weapons systems. This assessment was guided by stringent screening criteria, including the presence of supported units/missions, requisite training lands, live-fire capabilities, airspace and airfield capacity, installation support infrastructure, and the capacity of the local economy to provide support. These criteria were meticulously applied to ensure that only installations capable of meeting the specific and comprehensive needs of the proposed weapons systems were considered further. It is important to note that during this process, certain alternatives proposed for other installations were not carried forward for this specific installation due to their inability to meet the established criteria or because they were deemed more suitable for other locations based on their unique characteristics and strategic requirements.

# 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter presents a description of the environmental resources and baseline conditions that could be affected by the implementation of the alternatives. It also presents an analysis of the potential effects of each alternative to each environmental resource area. The affected environment has been determined using the criteria in NEPA, and the Army NEPA Guidance Manual.

The action area is defined as the area of analysis that could be affected directly or indirectly by the proposed action and not merely the immediate impact area involved in the action. The affected environment is defined for each resource area that is carried forward for detailed analysis.

## 3.1 Approach for Analyzing Impacts

The affected environment and the degree of effects of implementing an action are considered when determining the significance of potential effects to resource areas. In considering whether the effects of the proposed action are significant, the potentially affected environment and the degree of the effects of implementing the action are considered. The degree of effects considers short and long-term effects and beneficial and adverse effects. Effects and/or impacts that potentially result from the implementation of actions can be both beneficial and adverse as defined below:

- **Beneficial**: The impact of implementing the action would benefit the resource/issue.
- **Adverse**: The impact of implementing the action would not benefit the resource/issue.

The degree of environmental beneficial and adverse impacts are characterized as: none, negligible, minor, moderate, less than significant, significant, significant but mitigable, as defined below:

- **None**: There is no impact to the resource due to either the resource or the impact not being present or through full avoidance.
- **Negligible**: No measurable impacts are expected to occur. A negligible impact could locally alter the resource but would not measurably change its function or character.
- **Minor**: Primarily short-term but measurable impacts are expected. Impacts on the resource could be slight.
- **Moderate/less than significant**: Noticeable impacts that would have a measurable effect on a wide scale (e.g., outside the footprint of disturbance or on a landscape level). If implementation of the action were to result in moderate adverse impacts, those impacts would not exceed the limits of applicable, local, state, and federal regulations.
- **Significant but mitigatable**: Impacts resulting from implementation of the action would be significant, but measures are proposed to be implemented that would reduce the degree of impacts such that impacts are less than significant.
- **Significant**: A significant impact could exceed limits of applicable local, state, or federal regulations or would untenably alter the function or character of the resource. These

impacts would be considered significant unless managed by mitigation efforts to a less than significant level.

To maintain consistent evaluation of impacts in this PEA, the Army established thresholds of significance for each resource area (see Table 3-1). The Army developed these thresholds to take into account substantive environmental regulations and ensure an objective analysis of anticipated impacts. Although some thresholds have been designated based on legal or regulatory limits or requirements, others reflect some discretionary judgement on the part of the Army. Quantitative and qualitative analyses have been used, as appropriate, in determining whether and the extent to which a threshold is exceeded.

Implementation of the selected alternative may require additional site-specific analyses, including follow-on NEPA analysis, to address actions necessary for the installation to support fielding, stationing, operations, maintenance, siting considerations, and other environmental issues. Table 3-1 presents each resource area and thresholds of significance. The table also identifies which resource areas are analyzed in this PEA and which resource areas are dismissed from detailed analysis; each includes an accompanying rationale.

**Table 3-1: Summary of Resource Areas**

| ***Resource Area:*** | ***Threshold of Significance*** | ***Analyzed or Dismissed from Detailed Analysis*** | ***Rationale for Analyzing or Dismissing*** |
|---|---|---|---|
| Air Quality | An impact to ambient air quality would be considered significant if the proposed action were to cause or contribute to a violation of any federal, state, or local air quality standard or regulation. | Analyzed | Implementation of the proposed action would result in increased stationary source and vehicle emissions and potentially increase in fugitive dust emissions. This resource area is further discussed in Chapter 3. |
| Airspace | An impact to airspace would be considered significant if the proposed action violates FAA safety regulations or causes a substantial infringement of general aviation or commercial flight. | Dismissed | The addition of some of the weapons systems included in the proposed action would require use of the restricted airspace. Fort Sill has a restricted area complex of exclusive-use airspace and is of adequate lateral and vertical extent to accommodate the proposed weapons systems. Therefore, no further analysis of airspace is required. |

| | | | |
|---|---|---|---|
| Biological Resources | Impacts to biological resources would be considered significant if Army actions were to result in:<br>• Substantial permanent conversion or loss of net habitat,<br>• Long-term loss or impairment of a substantial portion of local habitat (species dependent),<br>• Loss of populations of species, or<br>• Unpermitted or unlawful take of ESA protected threatened or endangered species or species protected under the Bald and Golden Eagle Protection Act or the Migratory Bird Treaty Act. | Analyzed | The proposed action could adversely impact natural resources from increased ground disturbance and the potential for related vegetation loss and habitat degradation. This resource area is further discussed in Chapter 3. |
| Cultural Resources | Impacts to cultural resources would be considered significant if they cause alteration of the characteristics that qualify a property for inclusion on the NRHP (could include physical destruction, damage, alteration, removal, change in use, or character within the setting, and negligence causing deterioration, transfer, lease or sale). Alteration of properties, or access to properties, of religious or cultural significance to Native American Tribes would also be significant. | Analyzed | Construction and training activities associated with the proposed action could adversely impact cultural resources. This resource area is further discussed in Chapter 3. |

| | | | |
|---|---|---|---|
| Electromagnetic Spectrum | Impacts to electromagnetic spectrum would be considered significant if:<br>• Frequencies exceed Army Spectrum Management Office determined allowable frequencies to avoid electromagnetic interference, or<br>• Radar frequencies pose risk to injury to persons and animals. | Dismissed | Army access to or use of electromagnetic spectrum (EMS) within the U.S. must comply with the policies and regulations for the use of the spectrum by all federal agencies, as prescribed by the National Telecommunications and Information Administration Manual of Regulations and Procedures for Federal Radio Frequency Management and the provisions of DoD Instruction 4650.01. Organizations, activities, and individuals are assigned responsibility for performing technical research, development engineering, allocation, allotment, and assignment missions that support Army EMS management. EMS management is conducted within the limits of established Army policy. Coordination is conducted, as required, among one or many offices to resolve issues at the lowest possible level. Issues that cannot be resolved within these coordination channels are referred to command and staff channels for action. Noncompliance with these regulations may result in punitive action (AR 5-12). Following the mandated regulations for the EMS would prevent significant impacts on the EMS. The proposed weapons systems would operate within allowable and mandated EMS frequencies. Therefore, no further analysis of EMS is required. |
| Geologic and Soil Resources | Impacts to geologic and soil resources would be considered significant if:<br>• Impacts would occur to unique soil features, or<br>• Substantial soil losses were to impair plant growth or result in detrimental increases in stream sedimentation. | Analyzed | The majority of land disturbance activities would occur in previously disturbed areas. Implementation of the proposed action could remove vegetation and disturb soils to the extent that would increase soil erosion rates and alter drainage pattern in training areas. This resource area is further discussed in Chapter 3. |

| | | | |
|---|---|---|---|
| Hazardous and Toxic Materials and Waste | Impacts to hazardous and toxic materials and waste would be considered significant if a substantial additional risk to human health or safety would be attributed to Army actions, including direct human exposure or a substantial increase in environmental contamination. | Dismissed | Hazardous and toxic materials and wastes on Fort Sill are managed according to the Fort Sill Hazardous Material and Waste Management Plan which identifies the responsibilities, policies, and procedures for managing hazardous materials and wastes on the installation and ensures compliance with applicable federal, state, and local laws and regulations. Hazardous materials and waste used and generated during operation, including during testing and training are generally limited to fuel, vehicle fluids, lubricants, and munitions. To manage any accidental releases, all project activities would be conducted following the installation Spill Prevention Control and Countermeasures Plan. Therefore, no further analysis of hazardous and toxic materials and waste is required. |
| Human Health and Safety | Impacts to health and human safety would be considered significant if a substantial additional risk to human health or safety would be attributed to the proposed action, including direct human exposure to hazardous conditions or a substantial increase in conditions that adversely affect public health. | Analyzed | Protection of human health and safety has been and continues to be an integral part of the Army's mission at Fort Sill. Implementation of the proposed action may introduce or heighten hazardous conditions, particularly during live-fire training with the HP-DE systems. This resource area is further discussed in Chapter 3. |
| Land Use | Impacts to land use would be considered significant if the land use were incompatible with existing military land uses and designations (including recreation) and or sufficient land is not available. These impacts could conflict with Army land use plans, policies or regulations, or conflict with land use off post. | Analyzed | Implementation of the proposed action may impact land use at Fort Sill. The operation, storage, and support facilities of the proposed systems could necessitate changes to land use designations. This resource area is further discussed in Chapter 3. |

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| Noise | Impacts to noise would be considered significant if noise from Army actions were to cause harm or injury to on or off post communities or exceed applicable environmental noise limit guidelines. | Dismissed | Live-fire and maneuver training associated with the proposed action would be consistent with current noise levels generated by existing weapons systems currently operating on Fort Sill. Live-fire weapons (i.e. howitzers) would be used on existing targets that currently allow weapons using the same caliber and noise impacts would not change. Therefore, no further noise analysis is required. |
| Socioeconomics | Impacts to socioeconomics would be considered significant if they were to cause substantial changes to sales volume, income, employment, or population (including housing and schools). | Dismissed | The proposed action will increase the population at Fort Sill. However, the potential population increase is negligible when compared to the population of the ROI. Therefore, no further analysis of socioeconomics is required. |
| Transportation and Traffic | Impacts to transportation and traffic would be considered significant if Army actions:<br>• Cause a reduction by more than two levels of services at roads and intersections within the ROI,<br>• Substantially degrades traffic flow during peak hours, or<br>• Substantially exceed road capacity and design. | Dismissed | If all proposed weapons systems under the proposed action are fielded and stationed, the Fort Sill population could increase by approximately 4.1 percent. The potential population increase would generate more vehicle trips within the base and surrounding communities; however, this increase is expected to have only a minor impact on the existing road infrastructure. The existing road infrastructure is able to accommodate the size and weight of all proposed weapons systems. Once the exact weapon system configurations and fielding decisions are made, supplemental NEPA analysis would be necessary to assess the specific impacts on traffic and transportation infrastructure. Therefore, no further analysis of transportation and traffic is required. |
| Utilities | Impacts to utilities would be considered significant if the proposed action were to cause an impairment of service to the installation and local communities, homes, or businesses. | Analyzed | Implementation of the proposed action may affect utilities at Fort Sill. The construction of facilities related to the proposed weapons systems may require new connections to existing utilities and potentially increase utility demand. This resource area is discussed further in Chapter 3. |

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| Water Resources | Impacts to water resources would be considered significant if Army actions:<br>• Result in an excess sediment load in installation waters, affecting impaired resources,<br>• Substantially affect surface water drainage or stormwater runoff, including floodwater flows, or<br>• Substantially affect groundwater quantity or quality. | Analyzed | The proposed action could adversely impact surface water, wetlands, and floodplain resources within the installation from training and construction activities. This resource area is discussed further in Chapter 3. |

Legend: FAA=Federal Aviation Administration, ESA=Endangered Species Act, NRHP=National Register of Historic Places, EMS=electromagnetic spectrum, DoD=Department of Defense, AR=Army Regulation, HP-DE=High-Power-Directed Energy, U.S.=United States, ROI=Region of Influence, NEPA=National Environmental Policy Act.

## 3.2 Air Quality

Air quality in a given location is defined by the concentration of pollutants in the atmosphere. It is influenced by factors like the type and amount of pollutants, the size and topography of the air basin, and weather conditions. Most pollutants originate from human-made sources, including mobile sources (e.g., vehicles), stationary sources (e.g., factories, refineries, power plants), and indoor sources (e.g., building materials, cleaning solvents). Air pollutants are also released from natural events like volcanic eruptions and forest fires.

Air quality is regulated by the U.S. Environmental Protection Agency (USEPA) per the Clean Air Act (42 USC 7401 *et seq.*). The Clean Air Act established National Ambient Air Quality Standards (NAAQS) for the criteria pollutants: particulate matter (measured as both particulate matter with a diameter less than or equal to 10 microns [$PM_{10}$] and particulate matter with a diameter less than or equal to 2.5 microns [$PM_{2.5}$]), sulfur dioxide ($SO_2$), carbon monoxide (CO), nitrogen dioxide ($NO_2$), ozone, and lead. These standards are designed to protect public health and welfare. Individual states or air agencies may establish their own ambient air quality standards. The Oklahoma Department of Environmental Quality has adopted the NAAQS for purposes of regulating criteria pollutant levels within Oklahoma.

Geographic areas that are in compliance with the NAAQS are designated as “attainment areas.” Areas that do not meet NAAQS for criteria pollutants are designated “nonattainment areas” for that pollutant. Areas that have transitioned from nonattainment to attainment are designated as maintenance areas and are also required to adhere to maintenance plans to ensure continued attainment.

Potential impacts to ambient air quality are evaluated with respect to the context and intensity of the impact in relation to relevant regulations, guidelines, and scientific documentation. This requires the significance of the action to be analyzed with respect to the setting of the proposed action and based relative to the severity of the impact.

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere and are emitted through both natural processes and human activities. Scientific data indicate that global GHG concentrations have increased over the past century due to human activities. Within the Region of Influence (ROI), GHG emissions primarily result from transportation, energy use, and industrial activities. While the effects of GHGs are global in scale, local conditions may influence mission resiliency.

### 3.2.1 Affected Environment

Fort Sill Oklahoma is located in Comanche County, Oklahoma, which constitutes the ROI for air quality. Comanche County is within the Southwestern Oklahoma Intrastate Air Quality Control Region (40 CFR 81.125) and is in attainment or unclassifiable for all criteria pollutants (USEPA, 2024). Fort Sill is considered a synthetic minor source because its potential to emit would qualify it for Title V status, but its emissions are less than 100 tons per year for each of the criteria pollutants, and less than 10 tons per year for an individual hazardous air pollutant or 25 tons per year for two or more hazardous air pollutant emissions combined. The permit conditions require that these limits are not exceeded. The installation maintains a synthetic minor permit (permit number 97-373-C (M-18)). The air quality permit for sources at the installation is issued by Oklahoma Department of Environmental Quality as delegated by USEPA Region VI.

### 3.2.2 Environmental Consequences

Impacts to air quality would be considered significant if the proposed action were to cause or contribute to a violation to any federal, state, or local air quality standards or regulations or result in adverse impacts to sensitive populations.

#### 3.2.2.1 Proposed Action – Alternative 1

Alternative 1 proposes the fielding, stationing, operations, and maintenance of the IFPC and HP-DE and associated soldiers at Fort Sill. Approximately 290 vehicles would be added to the Fort Sill tactical vehicle roster, along with 165 portable generators. Fugitive dust generated by vehicular and equipment movements would result in a net increase of $PM_{10}$ and $PM_{2.5}$ emissions in the training areas. These dust emissions would largely be confined to these military use areas and are unlikely to generate large amounts of emissions offsite of the operational areas. An estimated 735 military personnel would relocate to Fort Sill in support of the weapon systems. Additionally, it is possible that a total of nearly 1,304 individuals would be added to the Fort Sill population with the addition of personnel families, for a total increase of 2,039 individuals.

The addition of the weapon systems and associated personnel increases are likely to require additional infrastructure. The limits, location and design of these infrastructure requirements are currently unknown. It is likely that some of the construction could require permitting and the location of new stationary sources would be required. These could range from emergency generators to boilers to industrial equipment such as spray paint booths. Stationary sources planned as part of new infrastructure would require review and inclusion in the installation's air permit(s). If new construction is required to implement this alternative, a supplemental NEPA analysis may be required.

The influx of staff and their families would increase the base population by 2,039 (approximately 3.8 percent) and would increase vehicular traffic on and off-base. While this increase in traffic would result in additional air emissions, the installation is located within an air basin that is currently in attainment for all NAAQS. Given this, any incremental increase in emissions from traffic and weapons systems operations would not be expected to cause or contribute to a violation of NAAQS. Therefore, no significant adverse impacts on regional air quality are anticipated. If construction is required to support the fielding and operation of the systems and their personnel, then supplemental NEPA analysis may be required, which will be determined once requirements are more fully known.

In summary, implementation of alternative 1, which includes weapons systems operations, possible construction, and the associated increase in traffic due to population growth, would lead to a slight increase in regional emissions, but not enough to exceed air quality standards.

#### 3.2.2.2 Proposed Action – Alternative 2

Alternative 2 includes the fielding, stationing, operations, and maintenance of the LTAMDS, IFPC, LRHW, MRC, and HP-DE weapons systems and associated soldiers to the installation. As a result, there would be a notable increase in fuel use and resultant increase in air emissions from operation of the additional weapon systems as compared to current conditions. Fugitive dust would also be generated by vehicular and equipment movements and would result in a net increase of $PM_{10}$ and $PM_{2.5}$ emissions in the training areas. These dust emissions would largely be confined to these military use areas and are unlikely to generate large amounts of emissions offsite of the operational areas. Up to 925 military personnel would relocate to Fort Sill in support of the weapon systems. Furthermore, it is possible that a total of 1,249 individuals would be added to the Fort Sill population with the addition of personnel families, for a total population increase of approximately 2,174 or 4.1 percent.

The addition of the weapon systems and associated personnel increases might require additional infrastructure or expanded training areas. The limits, location and design of this potential construction are not yet known. It is likely that some of the construction could require permitting and the location of new stationary sources would be required. These would range from emergency generators to boilers to industrial equipment such as spray paint booths. Stationary sources planned as part of new infrastructure would require review and inclusion in the installation's air permit(s). If new construction is required to implement this alternative, supplemental NEPA analysis may be required.

The influx of staff and their families would add to the vehicular traffic on and off base. The addition of approximately 925 military personnel alone could impact traffic queuing for installation ingress and egress at times of the day when shifts change. Adding an estimated 1,249 family members would also likely impact other roadways and intersections. These impacts may require supplemental analysis once the specific fielding requirements at the installation are known. In summary, the addition of the LRHW, MRC, IFPC, HP-DE, and LTAMDS weapons systems would result in an increase in regional air emissions from weapon system operations and traffic associated with the population increase. These emissions would not be enough to cause a violation of an ambient air quality standard, nor would sensitive

populations be impacted by training activities, so there would be no significant adverse impacts. If construction is required to support the fielding and operation of the systems and their personnel, then supplemental NEPA analysis may be required, which would be determined once requirements are more fully known. Potential adverse impacts from fugitive dust generation would require evaluation and possible mitigation to ensure that local dust control regulations are not violated. Traffic impacts may also require additional analysis to ensure that excessive queueing and idling are not an impact of the alternative implementation.

In summary, implementation of alternative 2, which includes weapons systems operations, possible construction, and the associated increase in traffic due to population growth, would lead to a slight increase in regional emissions, but not enough to exceed air quality standards.

#### 3.2.2.3 No Action Alternative

Under the no action alternative, none of the proposed weapons systems would be stationed or fielded at Fort Sill, and the Army would not enhance its structural MDO capabilities. Training activities and staffing conditions would remain consistent with current conditions. As a result, there would be no new sources of air emissions and, therefore, no impacts to air quality.

## 3.3 Biological Resources

Biological resources include sensitive and protected plant and animal species and associated habitats that are federally (U.S. Fish and Wildlife Service [USFWS]) or state (Oklahoma Department of Wildlife Conservation) listed for protection. Identifying which species occur in an area affected by an action is accomplished through literature reviews and coordination with appropriate federal and state regulatory agency representatives, resource managers, and other knowledgeable experts. The ROI for biological resources includes the habitats within and immediately surrounding the areas on Fort Sill. The action area is defined by federal regulation (50 CFR 402.02) as all areas to be affected directly or indirectly by the action and not merely the immediate area involved in the action.

Biological resources are comprised of the collective native or naturalized vegetation, wildlife, and their associated habitats. Existing information on vegetation and wildlife and their associated habitat types in the vicinity of the proposed sites were reviewed, with particular emphasis on the presence of any species listed as threatened or endangered by federal or state agencies to assess their sensitivity to the effects of the proposed action. For this PEA, biological resources are divided into three areas: vegetation communities, wildlife communities, and protected species under the following regulations:

- Bald and Golden Eagles, as protected under the Bald and Golden Eagle Protection Act(16 USC 17 668 [1972]);
- Protected species under the Migratory Bird Treaty Act ([MBTA] 16 USC 703-712 [2004]); and
- Threatened or endangered under the Endangered Species Act (ESA) of 1973 (16 USC 1531 *et seq*.) by USFWS

DoD Instruction 5525.17 establishes policy, assigns responsibilities, and provides direction for the Directorate of Emergency Services who is responsible for the enforcement of the laws and regulations pertaining to natural resources, including enforcement of hunting, fishing, area access, archeological, and environmental statutes and regulations at Fort Sill. Laws and regulations as well as enforcement responsibilities related to natural resources on Fort Sill are outlined within the Fort Sill 2020 Integrated Natural Resources Management Plan (INRMP) (Fort Sill, 2020b).

### 3.3.1 Affected Environment

Fort Sill is located in an ecological transition area where tall-grass prairie merges with short-grass prairie, and the area's soil variation has given rise to diverse plant communities. More than 70 percent of the installation is comprised of grassland communities, while a mix of dense woodland, riparian areas, oak savannah, and agricultural lease lands constitute the remaining areas.

#### 3.3.1.1 Flora

A brief description of the general vegetation communities at Fort Sill is presented below.

- **Mixed grass**: Vegetation comprised of a mix of grass species within the prairie habitat that may include little bluestem (*Schizachyrium scoparium*), switchgrass (*Panicum virgatum*), Indian grass (*Sorghastrum nutans*), blue grama (*Bouteloua gracilis*), and sideoats grama (*Bouteloua curtipendula*).
- **Mosaic**: A transitional area between various vegetation communities occurring on Fort Sill where realistic military training scenarios can be carried out.
- **Tall grass**: A mix of grass species that may include big bluestem (*Andropogon gerardii*), little bluestem, switchgrass, and Indian grass that dominate areas with deep soils.
- **Mesquite savanna**: Scattered grassland area dominated by mesquite shrubs (*Prosopis glandulosa*).
- **Riparian**: The area between land and a river or stream characterized by hydrophytic plants.
- **Cultivated alfalfa**: An agricultural area where alfalfa (*Medicago sativa*) crops are grown.
- **Food plot areas**: Wildlife food planting areas as part of the agriculture leasing program.

Detailed descriptions of vegetation communities at Fort Sill are provided in the INRMP (Fort Sill, 2020b).

#### 3.3.1.2 Fauna

A brief description of the general fauna communities at Fort Sill is presented below.

***Mammals –*** The diversity of natural environments at Fort Sill provides suitable habitat for a wide variety of mammal species. Frequently encountered mammal species include coyote (*Canis latrans*), bobcat (*Lynx rufus*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), cottontail rabbit (*Sylvilagus floridanus*), fox squirrel (*Sciurus niger*), beaver (*Castor canadensis*), opossum (*Didelphis virginiana*), prairie vole (*Microtus ochrogaster*), deer mouse (*Peromyscus maniculatus*), and white-footed mouse (*Peromyscus leucopus*). Less frequently encountered are

large herbivores such as elk (*Cervus elaphus*). Bison (*Bison bison*) inhabit the Wichita Mountains National Wildlife Refuge (WMWR) and have on occasion been found on Fort Sill. Game species include white-tailed deer (*Odocoileus virginianus*), elk, raccoons, feral pigs (*Sus scrofa*), and coyotes. Common bat species potentially occurring on Fort Sill include silver-haired bat (*Lasionycteris noctivagans*), Mexican free-tailed bat (*Tadarida brasiliensis*), eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), and the tricolored bat (*Perimyotis subflavus*) (Fort Sill, 2020b).

***Birds –*** The state of Oklahoma is within the Central Flyway migration corridor. This migration corridor is utilized by over 400 avian species. Fort Sill provides suitable stopover or resident habitat for many of these species. Bird species commonly observed at Fort Sill include American crow (*Corvus brachyrhynchos*), black-capped vireo (*Vireo atricapilla)*, common grackle (*Quiscalus quiscula*), European starling (*Sturnus vulgaris*), turkey vulture (*Cathartes aura*), bobwhite quail (*Colinus virginianus*), mourning dove (*Zenaida macroura*), and several species of swallows (*Hirundo* spp.). Avian game species on the installation include bobwhite quail, mourning dove, pheasants, and waterfowl species such as mallard, teal, and Canada and snow geese. Several natural areas providing habitat and refuge for birds, as well as many other wildlife species, have been established on the installation (Fort Sill, 2020b). The Eastern Yellow-billed Cuckoo (*Coccyzus americanus americanus*) is known to occur during the breeding season in viable habitats across Fort Sill. The USFWS recognizes it as distinct from the Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*) which is listed as a threatened species. However, only the Eastern Yellow-Billed Cuckoo is known to occur at Fort Sill (U.S. National Park Service, 2024).

***Fish –*** Aquatic habitat on Fort Sill includes several creeks and associated tributaries and ponds. Common fish species that could inhabit these waters include largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), redear sunfish (*L. microlophus*), green sunfish (*L. cyanellus*), channel catfish (*Ictalurus punctatus*), and others (Fort Sill, 2020b).

***Reptiles and Amphibians –*** A herpetological survey documenting species observations for the installation was performed at Fort Sill in 1991. A total of 45 species were either collected or verified by sightings (Caldwell et al. 1992 as cited in Fort Sill, 2020b). More recent observations have indicated a total of 54 known species, including a sighting of cottonmouth snakes (*Agkistrodon piscivorus*) in Cache Creek (Fort Sill, 2020b). Reptile species with potential to occur within Fort Sill could include a wide variety of turtles, lizards, and snakes. Amphibians could also be present, including salamanders, frogs, and toads.

Fort Sill has a diversity of habitats that support a variety of wildlife, including mammals, birds, fish, reptiles, and amphibians. Detailed descriptions of wildlife documented at Fort Sill are included in the INRMP (Fort Sill, 2020b).

#### 3.3.1.3 Protected Species

Special status plant and wildlife species are subject to regulations under the authority of federal and state agencies. The ESA (16 USC 1531 *et seq*.) of 1973, as amended, was enacted to protect and recover imperiled species and the ecosystems upon which they depend. The USFWS maintains a list of special status species considered endangered, threatened, or

candidate. Special status animal species are those that are of special interest due to such reasons as being state-listed, formerly rare, rare elsewhere, potentially rare, or possessing some unusual trait that arouses the interest of some people (Fort Sill, 2020b).

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. Candidate species include plants and animals that have been studied and proposed for addition by the USFWS to the federal endangered and threatened species list. All federal agencies are required to implement protection programs for endangered and threatened species and to use their authority to further the purposes of the act.

Migratory birds are protected by federal law and managed by the USFWS. The MBTA prohibits actions resulting in the pursuit, capture, killing, and/or possession of any protected migratory bird, nest, egg, or parts thereof. The USFWS maintains a list of designated migratory birds occurring in various regions of the U.S. The USFWS regulations allow for the incidental take of migratory birds for military readiness activities.

USFWS Information for Planning and Consultation (IPaC) and Oklahoma Natural Heritage Inventory (ONHI) special status species lists were obtained to identify species with potential occurrences near Fort Sill proper (Table 3-2). The IPaC pull dated June 3, 2025, identified three federally listed migratory bird species: piping plover (*Charadrius melodus*); whooping crane *(Grus americana)*; and red knot (*Calidris canutus rufa*). The tricolored bat (*Perimyotis subflavus*), a proposed endangered species, is known to occur at and around Fort Sill. No state-listed species were identified (USFWS, 2025).

The ONHI database was reviewed for federally and state-listed species, including candidate species, near the proposed action at Fort Sill. ONHI identified three recorded occurrences of the whooping crane *(Grus americana)*.

Although the Eastern Yellow-billed Cuckoo (*Coccyzus americanus americanus*) is not federally listed under the ESA and does not appear in the ONHI or IPaC special status species lists, it is protected under the MBTA. This species is known to occur in the region, including near Fort Sill, and its protection under the MBTA prohibits actions that could result in harm to individuals, nests, or eggs (U.S Army Corps of Engineers, 2023).

**Table 3-2. Special Status Species with Potential to Occur within Fort Sill**

| *Common Name* | *Scientific Name* | *Federal Protection Status* | *Habitat* | *Potential to Occur within Fort Sill* |
|---|---|---|---|---|
| **Mammals** | | | | |
| Tricolored bat | *Perimyotis subflavus* | Proposed Endangered | Roosts primarily among live and dead leaf clusters of live or recently dead deciduous hardwood trees. May roost in artificial structures or rocky crevices. During winter, species hibernate. This species is known to occur on Wichita Mountains Wildlife Refuge. | Yes |
| **Birds** | | | | |
| Piping plover | *Charadrius melodus* | Threatened | Found on mudflats, sandy beaches and shallow wetlands with sparse vegetation. Might be found along the margins of lakes and large rivers where there is exposed (bare) sand or mud. | Yes, rare migrant |
| Whooping crane | *Grus americana* | Endangered | Pass through Oklahoma during spring and fall migration. Stopover habitat includes shallow wetlands, marshes, margins of ponds and lakes, sandbars, and shorelines of shallow rivers, wet prairies and crop fields near wetlands. Critical habitat for the whooping crane is located approximately 150 miles north of Fort Sill near the Oklahoma/Kansas border. | Yes, rare migrant |
| Red knot | *Calidris canutus rufa* | Threatened | Migrates annually between its breeding grounds in the Canadian Arctic and wintering regions, including the southeast U.S., the northwest Gulf of Mexico, northern Brazil and the southern tip of South America. Might pass through Oklahoma during migration. | Yes, rare migrant |
| **Insects** | | | | |
| Monarch butterfly | *Danaus plexippus* | Proposed Threatened | Open areas with milkweed and flowering plants. | Yes |

Legend: U.S.=United States
Sources: Oklahoma Department of Wildlife Conservation, 2022; ONHI, 2024; USFWS, 2025

Of the four federally listed migratory bird species (Table 3-2) identified as having the potential to occur in Comanche County, none have been documented nesting at Fort Sill (Fort Sill, 2020b). Migratory routes for the piping plover and whooping crane do occur in the vicinity of Fort Sill, and it is possible these species could occur during migration periods but neither species has been documented at the installation (Fort Sill, 2020b). The red knot has never been observed at Fort Sill as of 2022. The Eastern Yellow-billed Cuckoo has been documented twice in Comanche County, however, both occurrences were outside of the installation at the WMWR (ONHI, 2024).

Other bird species under federal protection at Fort Sill include any other species listed under the MBTA (16 USC 703-712). Approximately 400 species of birds protected by the MBTA are known to occur on Fort Sill. Protection for these species is mandated through the MBTA, Executive Order (EO) 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*,

and Final Rule – Migratory Bird Permits; Take of Migratory Birds by the Armed Forces. Ongoing management and protection methods for migratory birds can be found in the INRMP (Fort Sill, 2020b).

The tricolored bat (*Perimyotis subflavus*) has a federal status of proposed endangered as of November 2022 (Proposed Rule 87 Federal Register 56381). The tricolored bat was documented across Fort Sill during acoustic monitoring surveys during the summer of 2024. Records also exist for this species at the WMWR. The refuge possesses a winter hibernaculum, making the occurrence of the species at Fort Sill possible. Fort Sill could potentially offer additional foraging habitat for tricolored bats. These foraging areas could include areas such as riparian zones along creek drainages and forest edges. Fort Sill also provides potential roosting, hibernating, and pupping habitat for the tricolored bat. In the 2022 proposal to list the tricolored bat as endangered, the USFWS proposed that the primary factor influencing its viability is white-nose syndrome, a disease of bats caused by a fungal pathogen. Other tricolored bat population stressors include those from wind-energy-related mortality, habitat loss, and effects from a shifting climate (Proposed Rule 87 Federal Register 56381).

During a 12-month finding published on December 17, 2020 (85 Federal Register 81813), the USFWS determined that the monarch butterfly (*Danaus plexippus*) warranted listing as an endangered or threatened species under the ESA. A proposed rule to list the species and designate critical habitat was published in the Federal Register on December 12, 2024 (89 Federal Register 100662). The initial 90-day public comment period closed on March 12, 2025, but to ensure comprehensive public engagement, the USFWS reopened the comment period for an additional 60 days, from March 19 to May 19, 2025. As of June 2025, the USFWS is reviewing public input and scientific data to inform a final determination, which is expected by the end of the year. Primary threats to the monarch's viability include habitat loss and degradation, herbicide use, drought, insecticide exposure, and various effects of a shifting climate (85 Federal Register 81813).

#### 3.3.1.4 Natural Resource Areas of Concern

The USFWS IPaC system was accessed to identify any National Wildlife Refuge lands and other natural resource areas potentially affected by the action alternatives. Through this review, the WMWR was identified as a Natural Resource Area of Concern (USFWS, 2025). The 59,020-acre WMWR, located directly northwest of the installation, supports mixed-grass prairie, granite mountain, and freshwater lake and stream habitats (USFWS, 2025). Additional information from the Fort Sill INRMP describes the WMWR as an ecosystem management partner, collaborating on black-capped vireo management, wildfire protection, fish stocking, and trespass issues (Fort Sill, 2020b).

Bald eagles utilize WMWR lakes for feeding and secluded WMWR sites for roosting during winter months. The number of wintering eagles, both bald and golden, varies from three to six in most years. Refuge management for this species is primarily protection from harassment, providing habitat, and active fishery management to ensure an adequate food supply for the eagles. Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act,

which prohibits take of individual birds and their parts (feathers, skins, etc.), eggs, or nests (Fort Sill, 2020b).

Additionally, the USFWS Environmental Conservation Online System was accessed to determine if designated critical habitat was present on or near Fort Sill. No critical habitat for the species referenced in Table 3-2 is present in Comanche County (USFWS, 2025).

### 3.3.2 Environmental Consequences

Impacts to biological resources would be considered significant if Army actions result in a substantial permanent conversion or loss of net habitat, long-term loss or impairment of a substantial portion of local habitat (species dependent), loss of populations of species, or unpermitted or unlawful take of ESA-protected threatened or endangered species, or species protected under the Bald and Golden Eagle Protection Act or the MBTA.

#### 3.3.2.1 Proposed Action – Alternative 1

Alternative 1 includes the fielding, stationing, operations, and maintenance of the IFPC and HP-DE weapons systems and their associated soldiers to the installation. Impacts to biological resources resulting from alternative 1 are anticipated to be largely driven by increased training impacts, and increased population. The Environmental Assessment for the Fort Sill Maneuver-Short Range Air Defense Battalion Stationing (U.S. Army Corps of Engineers, 2023) (henceforth referred to as 2023 Fort Sill M-SHORAD Stationing EA), the 2021 Programmatic Environmental Assessment for the Fielding of the Maneuver-Short Range Air Defense Capability (USAEC, 2021) (henceforth referred to as 2021 M-SHORAD Capability PEA) were used as analysis tools for this alternative as they assess similar anticipated impacts. These impacts are expected to be less than significant due to the use of existing training areas, and facilities when possible, as well as the utilization of existing best management practices (BMPs) and control measures employed by the Army.

The fielding, stationing, operations, and maintenance of the IFPC and HP-DE weapons systems and the associated personnel may require additional infrastructure or expanded training areas. The limits, location, and design of this potential construction are not yet known. If new construction is required to implement this alternative, supplemental NEPA analysis and/or ESA consultation may be required.

*Impacts from Live-Fire Training and Maneuver Training*

Live-fire and maneuver training under alternative 1 would occur within designated land use areas at Fort Sill. The range complex consists of forests, woodlands, grasslands, and riparian habitats. These activities may result in vegetation loss, soil compaction, rutting, and dust generation, which could lead to habitat degradation and increased sedimentation and erosion. However, Fort Sill employs range assessments, land rehabilitation, and maintenance actions to mitigate the deposition and leaching of munitions contaminants, erosion, soil compaction, and the potential for range fires (Fort Sill, 2020b).

To minimize the impact of military training on soil and vegetation, Fort Sill has implemented five key management techniques: (1) limiting total use, (2) redistributing use, (3) modifying types of

use, (4) altering user behavior, and (5) manipulating natural resources to increase durability (U.S. Army Corps of Engineers, 2018). In areas that are heavily impacted by training activities, temporary closures may be enacted to allow for land rehabilitation. The Land Rehabilitation and Maintenance initiative, part of the Integrated Training Area Management (ITAM) Program, manages soil and vegetation to enhance training capacity by repairing, maintaining, and reconfiguring training lands. Disturbed areas are reseeded with approved, site-specific seed mixes to minimize the establishment of invasive plant species. Together, these management strategies and existing BMPs help ensure that impacts to vegetation remain minimal while supporting ongoing rehabilitation of affected areas.

To limit disturbance to fauna, support vehicles would use existing roads whenever possible, and off-road travel would be restricted to testing/monitoring equipment positioning and recovery activities. These off-road movements would follow single paths to reduce vegetation disturbance. Wildlife species, including small mammals, rodents, and reptiles, are expected to temporarily vacate training areas when human activity level is high. Given the sparse wildlife distribution over a large region, and the natural tendency of wildlife to flee from perceived threats, direct impacts are expected to be minimal. While individual mortality may occur, population level impacts are not anticipated.

*Impacts from an Increase in Personnel*

The approximately 3.8 percent increase in Fort Sill's population under alternative 1 may lead to more human-wildlife interactions. However, this projected population growth is not expected to significantly impact biological resources. Any associated effects would be minor and temporary.

*Impacts to Protected Species*

Alternative 1 has the potential to impact protected species. A review of the USFWS IPaC database, ONHI database, and Oklahoma Department of Wildlife Conservation records identified four threatened or endangered birds as having the potential to occur within the action area. However, none of these species have been documented on Fort Sill, and implementation of the proposed action is not expected to result in any impacts to federally listed species.

Two species, the tricolored bat and the monarch butterfly, are not currently listed as threatened or endangered but have been proposed for listing. Both are identified in the USFWS IPaC database as potentially occurring within the action area. The implementation of the proposed action is not expected to jeopardize tricolored bat populations or affect potential habitat for the species. However, a notable concern is military vehicle use during maneuver training, particularly when vehicles depart established trails and roads. Off-road travel can lead to habitat destruction and fragmentation, disrupting critical foraging and breeding for sensitive species.

Additionally, off-road activity can inadvertently spread invasive species such as Johnsongrass, which outcompetes native vegetation, reduces plant diversity, and degrades habitat quality for wildlife, including the tricolored bat and monarch butterfly (Klein and Smith 2020). The physical disturbance from vehicles further compounds these effects by damaging vegetation and soil, making habitats less suitable for native species.

Implementation of the installation INRMP, along with consultation with the USFWS when necessary, would help ensure that the proposed action either avoids or minimizes impacts on

listed species and their habitats within the action area. Adhering to existing roads and operating within established limits on current training ranges and maneuver areas would further reduce the potential for adverse effects on protected species. Off-road travel would be limited to the placement of testing and monitoring equipment and the conduct of recovery activities, with access restricted to single entry and exit paths. Equipment placement would avoid vegetation removal during migratory bird nesting season. All activities would occur within existing mission footprints. As a result, impacts to protected species are expected to be less than significant.

*Impacts to Migratory Birds*

The incidental take of migratory birds during military training is exempt under the Department of the Interior Memorandum, December 22, 2017, and the Deputy Assistant Secretary of Defense Memorandum, 2018 (Department of the Interior, 2017, and Deputy Assistant Secretary of Defense, 2018, as cited in USAEC, 2021).

Implementation of the installation's INRMP, along with consultation with the USFWS as needed, would help ensure that the proposed action avoids or has minimal impact on migratory birds and their habitats within the action area. Limiting activities to existing roads and operating within established boundaries of current training ranges and maneuver areas would further reduce the potential for adverse effects. The areas affected by the proposed action fall within existing mission footprints. Impacts to migratory birds are expected to be less than significant.

In summary, minor adverse impacts are anticipated at Fort Sill under this alternative. The implementation of management and minimization measures, consistent with the Fort Sill INRMP and ITAM program, along with the use of existing BMPs, would help mitigate these impacts (Fort Sill, 2020b). Impacts to vegetation are expected to be long-term due to ongoing live-fire and maneuver training; however, they are anticipated to be minor and consistent with current land use. Impacts to threatened and endangered species, as well as migratory birds, are expected to be minimal and further mitigated through the continued implementation of the INRMP, ITAM program, and applicable BMPs. These impacts are not expected to have significant long-term effects on the viability of biological resources, as resident wildlife is likely to continue avoiding the affected areas, consistent with previous observations. Therefore, the implementation of this alternative is expected to result in less than significant impacts to biological resources.

#### 3.3.2.2 Proposed Action – Alternative 2

Alternative 2 proposes the fielding, stationing, operations, and maintenance of the LRHW, MRC, IFPC, HP-DE, and LTAMDS weapons systems, and associated soldiers to the installation. Impacts to biological resources under this alternative would primarily stem from increased population and increased training activities. The 2023 Fort Sill M-SHORAD Stationing EA was used as a reference for this analysis, as the primary drivers of biological impacts are similar across both projects. While an increase of personnel and training activities presents the potential for adverse impacts to biological resources, the use of existing facilities, along with implementation of BMPs, and Army control measures, would help mitigate these potential effects. Areas related to general capacity and support are not discussed in this section, as this alternative has already met the screening criteria outlined in Section 2.2.

Many of the biological impacts considered in alternative 1 would also apply to alternative 2. Therefore, this analysis focuses on the unique aspects of this alternative while assuming the same baseline impacts and mitigation measures from alternative 1 remain applicable. The primary difference between alternatives 1 and 2 lies in the projected increase in the installation's population. The implementation of management and mitigation measures consistent with the Fort Sill INRMP and the utilization of existing BMPs would reduce the described impacts. Vegetation impacts are expected to be long-term due to ongoing live-fire and maneuver training, but would remain minor as they are consistent with the current activities already occurring at Fort Sill.

The addition of the weapons systems and associated personnel may require additional infrastructure or expanded training areas. However, the specific limits, locations, and design of this potential construction are not yet known. If new construction is required to implement this alternative, supplemental NEPA analysis and/or ESA consultation may be required.

*Impacts from an Increase in Personnel*
Alternative 2 could increase the total Fort Sill population by approximately 4.1 percent. This population growth may lead to more human-wildlife interactions, increased activity in training areas, and greater wear on vegetation and soil. As noted previously, any infrastructure requirements associated with this population increase may require supplemental NEPA analysis and/or ESA consultation.

Minor adverse impacts are anticipated under alternative 2. The projected population increase, less than 5 percent above the current levels, would lead to higher traffic within training areas and ranges. Fort Sill proactively manages its conservation programs in these areas, where access is essential for carrying out management actions and monitoring efforts that support and track the stability and growth of threatened and endangered species populations. The application of management strategies consistent with the INRMP would help minimize impacts to these species, as well as reduce the degradation of vegetation and grasslands.

A population increase of approximately 4.1 percent within the ROI could result in some wildlife displacement. However, many wildlife populations on Fort Sill have adapted to live-fire and maneuver training activities and are not expected to react adversely to additional training.

In summary, many of the impacts to biological resources identified in alternative 1 remain applicable under this alternative. The increased personnel presence associated with alternative 2 would result in minor adverse impacts to biological resources due to greater activity in training areas and ranges. However, consistent implementation of the Fort Sill INRMP, ITAM Plan, and relevant BMPs would minimize these impacts. Therefore, the implementation of alternative 2 is expected to result in less than significant impacts to biological resources.

#### 3.3.2.3 No Action Alternative

Under the no action alternative, none of the proposed weapons systems would be stationed or fielded at Fort Sill and the Army would not enhance its structural MDO capabilities. Training activities and staffing conditions would remain consistent with current conditions. Therefore,

implementation of the no action alternative would not result in significant impacts to biological resources.

## 3.4 Cultural Resources

Cultural resources encompass a wide range of elements that reflect the historical, archaeological, architectural, and cultural heritage of an area. These include historic buildings, structures, objects, districts, archaeological sites, and tribal resources. In the context of NEPA, tribal resources refer to sites, features, places, cultural landscapes, sacred places, or objects with cultural value to a Native American Tribe.

The National Historic Preservation Act (NHPA) was passed into law in 1966 to prevent the inadvertent loss and protection of culturally significant properties. The NHPA includes provisions for the Department of Interior (DOI) to maintain the National Register of Historic Places (NRHP) (36 CFR 60). The NRHP is composed of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, engineering, and culture.

As defined by Fort Sill and as used in the 2013 Fort Sill *Integrated Cultural Resources Management Plan* (ICRMP) (Fort Sill 2013), cultural resources consist of and include the following:

- Historic properties as defined in 36 CFR 800.16(l) pursuant to the NHPA (54 USC 300308) and including artifacts, records, and material remains related to such resources;
- Archaeological resources, as defined in the Archaeological Resources Protection Act (54 USC 302107) and the Archeological and Historic Preservation Act (54 USC 469);
- Archeological artifact collections and associated records as defined in 36 CFR 79;
- Sacred sites under EO 13007 *Indian Sacred Sites*, and the American Indian Religious Freedom Act (AIRFA) (42 USC 1996 and 1996a); and
- Native American remains, objects of cultural patrimony, and cultural items as detailed in the Native American Graves Protection and Repatriation Act (NAGPRA) (25 USC 3001 *et seq*.).

The management of cultural resources is guided by Chapter 6 of AR 200-1. As outlined in AR 200-1, the Environmental Support Branch in the Environmental Quality Division (EQD) of the Directorate of Public Works (DPW) at Fort Sill has responsibility for compliance with Sections 106 and 110 of the NHPA, as well as the Archaeological Resources Protection Act, Archeological and Historic Preservation Act, NAGPRA, AIRFA, EO 13007 *Indian Sacred Sites*, and EO 13175 *Consultation and Coordination with Indian Tribal Governments.* EO 13007 identifies Native American sacred sites as “any specific, discrete, narrowly delineated location on federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site” (EO 13007, 1996). Confidentiality and access to these sites is mandated by EO 13007 and the AIRFA. For these reasons, no maps or descriptions are publicly available.

For this PEA, the impact analysis for cultural resources focuses on assessing whether the implementation of an alternative would have the potential to affect cultural resources that are listed in or eligible for listing in the NRHP, following the guidelines and standards set forth in the implementing regulations (36 CFR Part 800) of NHPA Section 106. Under Section 106 of the NHPA, the funding/permitting/approving federal agency is responsible for determining whether any historic properties are located in the area and in consultation with the State Historic Preservation Office, assessing whether the proposed undertaking would adversely affect the resources. An adverse effect is any action that may directly or indirectly change the characteristics that make the historic property eligible for listing in the NRHP. If an adverse effect is identified, the federal agency consults with the State Historic Preservation Office, federally recognized tribes, and the public to develop a resolution of adverse effects which seeks to avoid, minimize, or mitigate the adverse effects of the undertaking. Public involvement must occur early in the consultation process and not solely upon identification of an adverse effect, ensuring that the public is informed of any potential impacts to cultural resources and has the opportunity to provide input.

Analysis of potential impacts to cultural resources considers both direct and indirect impacts. Impacts could occur through the following:

- Physically altering, damaging, or destroying all or part of a resource.
- Altering characteristics of the surrounding environment that contribute to the resource's significance.
- Introducing visual or audible elements that are out of character with the property or alter its setting.
- Neglecting the resource to the extent that it deteriorates or is destroyed.

Direct impacts are assessed by (1) identifying the nature and location of all elements of implementing the alternative, (2) comparing the sites relative to identified historic properties, sensitive areas, and surveyed locations, (3) determining the known or potential significance of historic properties that could be affected, and (4) assessing the extent and intensity of the effects. Indirect impacts occur later in time or farther from the proposed action.

A key component of this analysis is defining the Area of Potential Effect (APE), defined as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 CFR 800.16(d)). The APE includes the entire installation of Fort Sill, which covers approximately 150 square miles of Comanche County, Oklahoma. The APE does not include any specific construction or allocation of buildings. If new facilities are constructed or existing facilities are modified to accommodate the weapons systems, then Section 106 consultation would be initiated and would include a project specific APE.

### 3.4.1 Affected Environment

Evaluating known cultural resources has been a major focus at Fort Sill in the recent past. These resources are identified and managed under the ICRMP. All standing buildings and structures constructed prior to 1974, and nearly 200 archaeological sites, have been evaluated

for NRHP eligibility. The archaeological site evaluations are ongoing, and the structures will continue to be evaluated as they meet the 45-year age requirement for NRHP evaluation. Three broad categories of cultural resources have been identified at Fort Sill. Category 1 consists of archaeological sites, including prehistoric (pre-1500), protohistoric (1500 to 1719), and historic (post-1719) period sites. Category 2 includes architectural/historic resources, including buildings, structures, landscapes, objects, and historic districts. Category 3 is restricted to NAGPRA-related remains, objects, and items. Sacred sites and Traditional Cultural Properties are not identified as separate categories, as these resources generally occur within Category 1 or 2.

Fort Sill has a diverse inventory of cultural resources that reflect the broad spectrum of peoples whose lifeways and activities have impacted the area through its development during prehistoric and historic periods. Of particular note is the Fort Sill National Historic Landmark District, which was recognized as a National Historic Landmark in 1960 and was automatically listed in the NRHP when it was created on October 15, 1966. The historic district includes the buildings, structures, sites, and landscapes associated with the original development of the Installation from 1869 to 1890. The Fort Sill National Historic Landmark District is also significant for its association with the Buffalo Soldiers of the 10th Cavalry and Henry O. Flipper, the first Black graduate of West Point. In addition to the Fort Sill National Historic Landmark District, there are ten other properties at Fort Sill listed in the NRHP (see Table 3-3). These historic properties exemplify Fort Sill's integral involvement in the development of the area with both military and Native American associations.

**Table 3-3: National Register of Historic Places Listed Properties at Fort Sill Historic District**

| *Property Name* | *NRHP ID Number* | *Resource Type* | *Date Listed* |
|---|---|---|---|
| Balloon Hangar at Henry Post Army Airfield | 15000826 | Building | November 20, 2015 |
| Blockhouse on Signal Mountain | 78002228 | Building | November 29, 1978 |
| Chiefs Knoll | 78002229 | Site | May 16, 1978 |
| Comanche Indian Mission Cemetery | 12000437 | Site | February 4, 2014 |
| Fort Sill | 66000629 | District | October 15, 1966 |
| General Officers Quarters | 75001563 | Building | April 14, 1975 |
| Indian Cemeteries | 77001510 | Site | August 10, 1977 |
| Medicine Bluffs | 74001659 | Site | December 31, 1974 |
| Old Tower Two | 74001660 | Structure | December 31, 1974 |
| Henry Post Airfield | 78002231 | Site | January 30, 1978 |

Legend: NRHP = National Register of Historic Places, ID = Identification

There are also a variety of additional resources located at Fort Sill that have been determined eligible for NRHP listing. According to the ICRMP, this includes "almost 40 archaeological sites and nearly 400 buildings and structures" representing the broad range of human occupation at the Fort Sill area. The ICRMP goes on further to explain that many of the NRHP eligible buildings and structures are located within one of the installation's ten NRHP eligible historic districts (Fort Sill, 2013).

### 3.4.2 Environmental Consequences

Impacts to cultural resources would be considered significant if they cause alteration or the characteristics that qualify a property for inclusion on the NRHP (e.g., physical destruction, damage, alteration, removal, change in use, or character within the setting, and negligence causing deterioration, transfer, lease or sale).

#### 3.4.2.1 Proposed Action – Alternative 1

Alternative 1 proposes the fielding, stationing, operations, and maintenance of the IFPC and HP-DE weapons systems and associated soldiers at Fort Sill. Approximately 290 vehicles would be added to the Fort Sill tactical vehicle roster, along with 165 portable generators. An estimated 735 military personnel would relocate to Fort Sill in support of the weapon systems. Additionally, it is possible that a total of nearly 1,304 family members would accompany the new soldiers, for a total increase of 2,039 individuals to the Fort Sill population.

The addition of the weapon systems and associated personnel are likely to require additional infrastructure. The limits, location, and design of these infrastructure requirements are currently unknown. It is likely that some new construction and/or conversion and repurposing of existing structures and buildings could be required for the implementation of the necessary infrastructure to support the additional weapons systems. If new construction and/or conversion and repurposing of existing structures and buildings are required to implement this alternative, supplemental NEPA documentation and/or Section 106 consultation may be required. Any built resources aged 45 years or older and any archaeological sites located within a defined APE for the implementation of alternative 1 should be assessed for NRHP eligibility and for any potential impacts resulting from the implementation of this alternative.

All resources are managed in accordance with the Fort Sill ICRMP, which includes policy and processes to protect archaeological sites. These include maintaining a database of known resources and monitoring as feasible, those resources for disturbance. Sites that are pending evaluation and those that are eligible for listing in the NRHP are actively avoided during maneuver training.

Identifying resources within the APE is required and provides for the implementation of a BMP to avoid adverse effects. Increased training activities are expected to have less than significant impacts on cultural resources. Monitoring, training personnel to report cultural materials, and applying BMPs mitigate potential impacts. An increase in personnel provides further opportunities for encountering and potentially disturbing cultural resources. However, prior knowledge of NRHP listed or eligible sites and avoidance ensures that no adverse effects would occur. Therefore, implementation of alternative 1 is expected to have less than significant impacts to cultural resources.

#### 3.4.2.2 Proposed Action – Alternative 2

Alternative 2 includes the fielding, stationing, operations, and maintenance of the LRHW, MRC, IFPC, HP-DE, and LTAMDS weapons systems along with their associated soldiers to Fort Sill. This alternative would include up to 925 military personnel relocating to Fort Sill in support of the weapon systems. Additionally, it is possible that a total of 1,249 family members would

accompany the new soldiers, for a total population increase of 2,174 individuals to the Fort Sill population.

The addition of the weapons systems and associated personnel might require additional infrastructure or expanded training areas. The extent, location, and design of potential construction are not yet known, but new construction and/or repurposing of existing structures may be necessary. If required, supplemental NEPA documentation and/or Section 106 consultation may be required.

Cultural resources within the APE would be managed in accordance with the Fort Sill ICRMP, which includes policies for identifying, monitoring, and protecting archaeological sites. NRHP-listed or eligible sites, as well as unevaluated resources, would be avoided during maneuver training. Increased training activities and personnel presence may elevate the potential for encountering cultural materials; however, adherence to established BMPs, regular monitoring, and training personnel to report discoveries would mitigate impacts. Therefore, implementation of Alternative 2 is expected to have less than significant impacts on cultural resources.

#### 3.4.2.3 No Action Alternative

Under the no action alternative, none of the proposed weapons systems would be stationed or fielded at Fort Sill, and the Army would not enhance its structural MDO capabilities. Training activities and staffing conditions would remain consistent with current conditions. Therefore, implementation of the no action alternative would not result in significant impacts to cultural resources. No additional action is recommended should the no action alternative be chosen as the preferred alternative.

## 3.5 Geological and Soil Resources

Geologic resources are features produced from the physical history of the Earth, including rocks and formations of rocks that occur in the form of outcrops or under soil. Geologic resources are evaluated to identify areas of geologic hazards that may exist relative to the proposed action. 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.

Prime farmland is protected under the Farmland Protection Policy Act of 1981 (7 CFR 658). This act was developed to minimize federal program contributions to the unnecessary or irreversible conversion of farmland soils to nonagricultural uses. Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. The land could be cropland, pasture, rangeland, or other land, but not urban built-up land (defined by the U.S. Census Bureau or by U.S. Geological Survey topographic maps) or water. The U.S. Department of Agriculture Natural Resources Conservation Service is responsible for overseeing compliance with the Farmland Protection Policy Act.

Soil erosion effects are generally dependent upon a variety of factors, including geologic formations, soil structure and composition, climate, topography, and vegetative cover. The structure and composition refer to the physical features of soil, such as compaction, moisture,

and composition, based on the bedrock material and mineral deposits. Climactic soil erosion effects primarily revolve around the abundance and intensity of precipitation in each environment. Topographic descriptions are typically in respect to the elevation, slope, aspect, and surface features (e.g., surface roughness) found within a given area. Vegetative cover is an interface between the atmosphere and soil surface, influencing the overall permeability and potential runoff.

This analysis focuses primarily on the geology, soils, and soil erodibility of Fort Sill. Given this PEA covers the entirety of Fort Sill this analysis focused on how the increases of soldiers impacts geological and soil resources. Detailed and full descriptions of the Fort Sill's geology, soils, topography, and soil erodibility can be found in the INRMP (Fort Sill, 2020b), and will be analyzed in detail when specific actions occur.

### 3.5.1 Affected Environment

The region of Fort Sill contains some of the oldest geologic formations in Oklahoma. The Wichita Mountains, formed during the Cambrian Period, are primarily composed of igneous rocks such as granite and rhyolite. The eastern portion of Fort Sill is underlain by Permian-aged red beds typically composed of iron-rich sandstone and siltstone. Under these formations are a wide assortment of limestones, dolomites and conglomerates, and other igneous rocks.

Soils of Fort Sill are located along the Major Land Resource Area boundaries of the Wichita Mountains, Central Rolling Red Plains, and Central Rolling Red Prairies (Oklahoma Geological Survey, 2022). Comanche County is drained mostly by tributaries of the Red River. Small areas are drained by the Washita River and its tributaries. The topography ranges from the nearly level floodplains along the rivers to steep uplands associated with the Wichita Mountains.

Combinations of rock outcrop and Brico soils, such as Rock outcrop-Brico complex, 3 to 20 percent slopes, are common throughout Fort Sill. Common soils present on the installation include the Brico, Foard, and Tillman soil series (Natural Resources Conservation Service [NRCS], 2024). The most abundant soils in the ROI are Rock-outcrop-Brico/Brico-Rock-outcrop complexes (16,668 acres) and Foard-Hinckle complex (6,504 acres). Other common soils in the ROI include Ford and Tillman soils, Lawton loam, and the Vernon-Knoco complex. Erosion potential for all of these soils in the ROI is slight.

Although no farmlands in Comanche County are classified as unique, nine soil series in the county are classified as prime farmland soils. Four of the nine series occur on Fort Sill, but only two cover large areas of land on Fort Sill. Approximately 25,066 acres (approximately 38 percent) of Fort Sill are classified as prime farmland soils (NRCS, 2024). Prime farmland soils in the ROI include but are not limited to Lawton loam, Ashport loam, and Konawa loamy fine sand.

Soil disturbance that is not properly managed results in erosion. Fort Sill recognizes the importance of keeping its soils in place to support plant growth because a variety of vegetation communities are important for training exercises. The transport of sediment during erosion has been identified as the number one pollutant of waterways on Fort Sill. Sedimentation has also led to indirect impacts to other resources. Furthermore, fire breaks and their maintenance result in soil erosion that negatively impacts water quality as well as spreading invasive species

across the range. While a known impact, these fire breaks are necessary to contain fires that may be ignited from existing and proposed weapons systems. For these reasons, Fort Sill has adopted an aggressive soil erosion management policy to mitigate and manage these issues.

In an effort to comprehensively manage and protect soil resources on Fort Sill, the INRMP (Fort Sill, 2020b) contains soil management goals and objectives designed to protect soil resources and prevent soil destabilization and erosion. Impacts to soil resources are reduced through implementation of the existing soil resource environmental stewardship guidelines contained within the INRMP. Frequent land evaluations determine which remediation measure is needed, and if installation activities must be rotated to other areas while designated land areas recover.

### 3.5.2 Environmental Consequences

Impacts to geologic and soil resources would be considered significant if impacts would occur to unique soil features, or if substantial soil losses were to impact plant growth or result in detrimental increases in stream sedimentation. A significant impact to geologic resources or soils would occur if one or more of the following occurs:

- A geologic hazard is identified at a particular location or results from an action.
- Substantial soil loss or compaction precluding the reestablishment of vegetation.
- Erosion causing detrimental effects to aquatic life in adjacent waters.
- A violation of applicable federal or state law, regulation, or permit.

Minor, adverse impacts to prime farmland would occur only if the proposed action would irreversibly convert prime farmland (directly or indirectly) to nonagricultural use.

#### 3.5.2.1 Proposed Action – Alternative 1

Alternative 1 includes the fielding, stationing, operations, and maintenance of the IFPC and HP-DE weapons systems along with their associated soldiers to the installation. Impacts from alternative 1 are anticipated to be largely driven by increased training impacts, and increased population. Given these are the primary issues analyzed, the Fort Sill 2023 M-SHORAD Stationing EA is used as an analysis tool for this alternative. These impacts are expected to be less than significant due to the use of existing training areas, the use of existing facilities, and the existing BMPs and control measures employed by the Army.

The increase in the number of weapons systems and associated personnel might require additional infrastructure or expanded training areas. The limits, location, and design of this potential construction are not yet known. If new construction is required to implement this alternative, supplemental NEPA analysis might be required.

Vehicles, foot traffic, the use of large equipment, and ammunition on targets in the range are anticipated to cause short-term, direct soil compaction and disturbances. However, erosion impacts would be temporary and minimized through continued adherence to the ITAM program and employing BMPs for soil erosion and sedimentation.

There are prime farmland soils located on Fort Sill (NRCS, 2024). These soils are located in areas currently utilized as maneuver area heavy training areas and have been subject to

ongoing disturbance. Prime farmland soils would not be irreversibly converted (directly or indirectly) to nonagricultural use by the proposed BN-level training activities; therefore, no significant impacts to prime farmland soils would result from the implementation of the proposed training.

Fort Sill is committed to maintaining the sustainability of its ranges through the ITAM program to both minimize erosion impacts and repair areas that could experience erosion during training activities. Areas experiencing non-sustainable use would be evaluated and BMPs would be applied for sustainable soil uses as funding is available. The selection of and use of BMPs depends upon specific soil types and ground conditions in the areas disturbed by training, but could include stabilization of stream crossings, trail stabilizations, revegetation, sediment retention structures, gully repairs, and repairing areas of compacted soil.

*Impacts from Live-Fire Training and Maneuver Training*
Weapons training would increase under the implementation of the proposed action, although it is unknown at this time to what extent. It is anticipated that weapons training events would be periodic and that minor long-term impacts are expected due to the deposition of munitions constituents resulting in soil contamination.

Maneuver training would increase across the existing training areas. This is expected to damage or remove vegetation and disturb soils to the extent that would increase soil erosion rates and alter drainage patterns in the training areas, which could lead to gullying, and indirectly to downstream sedimentation, particularly when the vehicles travel off-road. While most of the off-road maneuvering would occur in existing maneuver areas, there may be areas used for maneuvering that has not been previously used. The overall weight, size, and types of training activities would be consistent with existing live-fire and maneuver training, and therefore, impacts are anticipated to be less than significant.

#### 3.5.2.2 Proposed Action – Alternative 2

Alternative 2 includes the fielding, stationing, operations, and maintenance of the LRHW, MRC, IFPC, HP-DE, and LTAMDS weapons systems, along with their associated soldiers to the installation. Many of the impacts to geological resources considered in alternative 1 remain the same for this alternative. This analysis focuses only on the unique aspects of this alternative while assuming the impacts from alternative 1 remain, primarily the difference in the population increase. Given these are the primary issues analyzed, the 2023 Fort Sill M-SHORAD Stationing EA (U.S. Army Corps of Engineers, 2023) is used as an analysis tool for this alternative. Importantly, the implementation of management and minimization measures consistent with the Fort Sill INRMP, as well as the utilization of existing BMPs, would minimize any such impacts. The impacts on vegetation are expected to be long-term due to ongoing live-fire and maneuver training. However, these impacts are anticipated to be minor as they are consistent with the current activities already occurring on Fort Sill.

The increase in the number of weapons systems and associated personnel might require additional infrastructure or expanded training areas. The limits, location, and design of this potential construction are not yet known. If new construction is required to implement this alternative, supplemental NEPA analysis might be required.

*Impacts from Increase in Personnel*

Under alternative 2, the installation population could increase by approximately 4.1 percent, based on estimates of the required soldiers and their families for this alternative. This increase is not expected to impact geologic or soil resources. All soil impacts would be related to construction and training activities. The implementation of management measures consistent with the INRMP is expected to reduce potential impacts. Additionally, applying the minimization measures outlined in the INRMP would help prevent vegetation degradation, thereby reducing soil erosion.

There would be minor impacts to soil resources at Fort Sill resulting from the associated increase in the frequency of unit maneuver and live-fire training events. Exposed soils would become more susceptible to erosion, and soil productivity may decline in training and disturbed areas. With the potential addition of up to 4.1 percent more soldiers and associated family members, more vehicles would be expected in training areas. As vegetation is disturbed in training areas, more bare soils would be exposed to water and wind erosion resulting in a greater amount of sedimentation to occur in the regional surface waters. Fort Sill would continue to use the ITAM workplan to continue monitoring training lands for disturbance and would plan and implement rehabilitation and erosion control measures in areas of high use. Management procedures outlined in the installation's INRMP would also assist with soil conservation.

In summary, increased live-fire and maneuver training may impact vegetation and disturb soils, causing erosion and drainage patterns, but BMPs would mitigate these impacts (Fort Sill, 2020b). Construction activities may lead to soil compaction, erosion, and stormwater runoff, affecting groundwater recharge, but BMPs and stormwater management plans would minimize these effects. The population increase is not expected to impact soil beyond construction and training activities, causing only minor soil impacts. Fort Sill would mitigate these effects using the ITAM workplan, the installation's INRMP, and other BMPs. Therefore, implementation of alternative 2 is expected to have less than significant impacts on geological and soil resources.

#### 3.5.2.3 No Action Alternative

Under the no action alternative, none of the proposed weapons systems would be stationed or fielded at Fort Sill and the Army would not enhance its structural MDO capabilities. Training activities and staffing conditions would remain consistent with current conditions. Therefore, implementation of the no action alternative would not result in significant impacts to geological and soil resources.

## 3.6 Human Health and Safety

This section addresses health and safety for activities that have the potential to affect contractors, site workers, members of the public, soldiers, and Fort Sill personnel. Protection of human health and the environment has been and continues to be an integral part of the Army's mission at Fort Sill. Activities on Fort Sill must comply with all applicable federal and state, DoD, Army, and installation-level occupational health, safety, and environmental requirements to ensure that activities are conducted with no or minimal risk to persons or the environment, both on and off Fort Sill.

The Army's policies, responsibilities, and procedures to protect Army personnel and property are contained in AR 385-10. This regulation provides for operational safety, safe and healthy workplaces, and ensures compliance with applicable laws and regulations. Fort Sill also has its own health and safety regulations, contained in Fort Sill Regulation 385-1, Safety Regulation. These regulations implement requirements of the Occupational Safety and Health Act of 1970 as implemented in EO 12196, Occupational Safety and Health Programs for Federal Employees, DoD Instruction 6055 Series, and AR 385-10. Specifically, Fort Sill Regulation 385-1 establishes responsibilities, procedures, and rules for all personnel utilizing the Installation Range Complex by personnel assigned, attached, or transient to Fort Sill. In addition, the DoD Unified Facilities Criteria 4-010-01 establishes minimum engineering standards that incorporate antiterrorism mitigating measures where no identified threat or level of protection has been determined in accordance with Unified Facilities Criteria 4-020-01. These standards are required of all projects constructed on military installations (Whole Building Design Guide, 2024).

The mission of the Fort Sill Installation Safety Office is: "To fully support the command's mission while providing the best possible accident and injury prevention programs for all of Team Sill personnel." Fort Sill recently updated the Fort Sill Garrison Safety Standard Operating Procedure (SOP) 23-02, effective March 15, 2024. The proponent of this regulation is the Fort Sill Safety Officer (Fort Sill, 2024). SOP 23-02 includes reference to Fort Sill Regulation 385-64, Explosives Safety Management Program, which provides all Fort Sill personnel and contractors with the ammunition management procedures at Fort Sill. The Fort Sill mission is also fully supported by Fort Sill's higher command, the Army Installation Management Command, which ensures that their over-reaching U.S. Army safety mission is implemented at Fort Sill.

### 3.6.1 Affected Environment

Munitions and explosives of concern, such as unexploded ordnance, are a safety concern at Fort Sill. The installation has specific procedures and land use controls that must be followed before conducting ground-disturbing activities to minimize munitions and explosives of concern-related hazards.

Wildfires are a natural hazard in most regions of Oklahoma and the southwest, posing a threat to life and property, particularly where native ecosystems are adjacent to developed areas. Fort Sill maintains an Integrated Wildland Fire Mitigation Plan to help prevent and manage wildfires at the installation (Fort Sill, 2018a). The plan is a comprehensive and synchronized plan that includes the local fire department, Range Operations, the DPW, and Fort Sill's military units (U.S. Army, 2019). Fort Sill frequently has a high risk of range fires. Unless fire breaks are well maintained and available fuel controlled through regular mowing and prescribed burns, range fires are a hazard to range structures, target systems, and communities surrounding Fort Sill.

Fort Sill has a high potential for dangerous storms, particularly tornados and severe thunderstorms. The base is located in Tornado Alley, a loosely defined location in central U.S. and Canada where tornadoes are most frequent. Although a tornado has not touched down on post in over ten years, tornados have formed in the area and impacted nearby communities. The last tornado to touch down in Comanche County occurred in Lawton in April 2013 (National

Weather Service, 2024). In response to the threat, storm shelters have been placed on selected ranges, tactical training bases, and bivouac sites (U.S. Army, 2012).

The Fort Sill Range Complex has numerous abandoned tactical telephone communications lines and drops for field telephones. Several of the lines have fallen from poles and created a hazard to both personnel and equipment. The locations of all of these communications lines are not recorded.

The Directorate of Emergency Services on Fort Sill manages law enforcement operations and the Fort Sill Fire Department. The Fort Sill Fire Department manages four fire stations on Fort Sill. All open Fort Sill gates are manned and there is controlled/limited access to Fort Sill. Fort Sill maintains a written Emergency Action Plan as well as detailed emergency and mishap response plans for the various tenants, units, directorates, and agencies at Fort Sill (Fort Sill, 2024). These plans assign agency responsibilities and prescribe functional activities necessary to react to major mishaps.

Wide varieties of different weapon systems are currently used at Fort Sill on a daily basis. These systems range from small arms (e.g., 12-gauge shotgun, M-16, M203, 50-caliber) to anti-tank guns (e.g., the AT4) to larger Field Artillery/ADA systems (e.g., the 155 mm Howitzer, the Avenger missile system, and the High Mobility Artillery Rocket System). Fort Sill Range Operations is responsible for the management and operation of all the ranges to prevent conflicting uses and provide a safe training environment for soldiers and the public (Fort Sill, 2018b).

Range Operations continually assesses the risks associated with weapons use and establishes mission parameters that minimize the potential safety hazards. Specific weapon safety footprints must be assessed against each intended target to ensure that they can be safely used. Range Operations deconflict overlapping training events and develop range management plans for the training ranges used and transient aircraft. In addition, Range Operations assigns responsibilities and provides direction regarding range scheduling, maintenance, explosive ordnance disposal, range decontamination, and debris disposal (Fort Sill, 2018b).

Surface Danger Zones (SDZs) are a key aspect of providing safe ranges. SDZs are designed to minimize the probability of hazardous fragment or round escapement from installation boundaries and to minimize the danger to the public, installation personnel, facilities/equipment, and property. SDZs and associated exclusion areas are off-limits to non-participating personnel during active range use (Fort Sill, 2018b).

### 3.6.2 Environmental Consequences

Impacts on health and human safety would be considered significant if a substantial additional risk to human health or safety would be attributed to the proposed action, including direct human exposure to hazardous conditions or a substantial increase in conditions that adversely affect public health.

#### 3.6.2.1 Proposed Action – Alternative 1

Alternative 1 includes the fielding, stationing, operations, and maintenance of the IFPC and HP-DE weapons systems along with their associated soldiers to the installation. Both the IFPC and HP-DE weapons systems would be stored and operated per SOPs, such as SOP 23-02 (Fort Sill, 2024), while adhering to applicable regulations, including Fort Sill Regulation 385-1, and incorporating general BMPs as outlined in the INRMP (Fort Sill, 2020b). Operational actions of the IFPC would follow the established SOPs, regulations, and BMPs to ensure safe and effective implementation. By adhering to these measures, the risk of health or safety incidents is minimized, and there would be no substantial additional risk to human health or safety by fielding, stationing, operating, or maintaining the IFPC at Fort Sill.

The HP-DE weapon systems are future weapons of the existing DIVAD BN and proposed IFPC BN or Battery. These include the IFPC DE and M-SHORAD Inc 2 (DE). The HP-DE systems particularly the IFPC-HPM, may cause harm to human health. In an article posted to the National Library of Medicine, it is contended that “High-power microwave applications are growing for both military and civil purposes, yet they can induce brain-related risks and raise important public health concerns. High-power sub-millisecond radio frequency energy pulses have been demonstrated to be able to induce neurological and neuropathological changes in the brain while being compliant with current regulatory guidelines’ limits.” (Yaghmazadeh, 2024).

Lasers, with appropriate backstops, are currently used on Fort Sill as pointers, markers, target designators, and for other purposes. Laser classes are categories that define the safety hazards of laser devices based on their power output and potential to cause harm. They range from Class 1, which is considered safe under all conditions of use, to Class 4, which includes high-powered lasers capable of causing severe damage to both eyes and skin, even from reflections. All four classes of lasers are used at Fort Sill. While Class 1 and 2 lasers can be used anywhere, Class 3 and 4 lasers can only be used in designated areas (Fort Sill, 2018b).

The Army Public Health Command Nonionizing Radiation Program provides laser range-specific technical expertise on laser hazards to personnel operating lasers. Fort Sill Regulation 385-1, Chapter 8, provides guidance for the safe use of tactical lasers, pointers, and markers on Fort Sill, excluding Falcon Range. Per Fort Sill Regulation 385-1, Fort Sill Range Operations develops procedures for laser use on a case-by-case basis (Fort Sill, 2018b).

The Laser Range Safety Officer is responsible for the safe conduct of laser operations at lasing points. Army laser range safety guidance is described in the Department of the Army Pamphlet 385-63. The specific guidelines to ensure the proper control of hazardous laser energy are outlined in Military Handbook-828C, Chapter 8. Chapter 7 of the Department of the Army Pamphlet 385-24 identifies the training requirements for laser safety officers. As part of the Fort Sill laser range safety protocols, all personnel participating in laser operations are required to wear protective eyewear. In addition, restrictive signage, establishment of safety zones, and evacuation of non-mission essential personnel prior to lasing activities are all part of the Fort Sill Safety Program (Fort Sill, 2018b).

In 2015, Fort Sill approved the EA for *Demonstrations of Various Electric Fires and Loitering Aerial Munition Systems at Fort Sill, Oklahoma*. The EA evaluated the potential environmental

impacts of conducting demonstrations of advanced electric weapons systems, such as directed energy and electromagnetic technologies. The assessment concluded with a finding of no significant impact on Fort Sill and the surrounding areas. A specific range for these electric fires has not been established at Fort Sill. Instead, the entire West Range is available for use, with approximately 98 percent of demonstrations occurring at Thompson Hill. This location is particularly suited for laser systems above the horizon, as well as railgun and high-power microwave technologies.

In summary, the fielding, stationing, operations, and maintenance of the proposed weapons systems under alternative 1 could impact human health and safety. The IFPC system poses no substantial additional risk to the Fort Sill and surrounding communities. The HP-DE weapons systems, such as lasers and high-power microwaves, could increase the risk of hazardous conditions. However, the EA for *Demonstrations of Various Electric Fires and Loitering Aerial Munition Systems at Fort Sill, Oklahoma*, demonstrated that these advanced systems would have no significant impact on human health and safety, both on post and in surrounding areas, due to established safety protocols (U.S. Army, 2015). Interviews with Fort Sill range personnel confirmed that since 2015 dozens of demonstrations using high-power laser and microwave systems similar to the IFPC-HEL and IFPC-HPM have been conducted without incident The Army is dedicated to conducting ongoing reviews of the latest research on the health effects of high-power microwave technology and has developed specific SOPs and SDZs to protect soldiers and civilians during the operation of these systems. Therefore, implementation of alternative 1 is expected to have less than significant impacts on health and human safety.

#### 3.6.2.2 Proposed Action – Alternative 2

Alternative 2 includes the fielding, stationing, operations, and maintenance of the LRHW, MRC, IFPC, HP-DE, and LTAMDS weapons systems, along with their associated soldiers to the installation. The potential impacts on human health and safety from the fielding, stationing, operations, and maintenance of the IFPC and HP-DE are discussed under alternative 1. The impacts listed under alternative 1 apply to this alternative and are considered in the final assessment of the level of impact. However, to avoid redundancy, this section will only discuss the LRHW, MRC, and LTAMDS. The LRHW, MRC, and LTAMDS weapons systems would be stored and operated per SOPs, such as SOP 23-02 (Fort Sill, 2024), while adhering to applicable regulations, including Fort Sill Regulation 385-1, and incorporating general BMPs as outlined in the INRMP (Fort Sill, 2020b).

All operational actions of the LRHW, MRC, and LTAMDS would follow the established SOPs, regulations, and BMPs to ensure safe and effective implementation. The SDZ must be adhered to for safety. The projected SDZs for the LRHW and MRC will preclude actual live fire of the munitions on Fort Sill, but simulations would fill the training requirements. Depending upon the location of operation for the LRHW, MRC, or LTAMDS range or training changes may be necessary.

In summary, the fielding, stationing, operations, and maintenance of the weapons systems proposed under alternative 2 could impact human health and safety. As discussed previously, the IFPC poses no substantial additional risk to human health and safety to the population of

Fort Sill. The HP-DE weapons systems could increase the risk to human health, but this risk is mitigable through the implementation of SOPs, BMPs, and adherence to applicable regulations. The LRHW, MRC, and LTAMDS would add no significant risk to human health as long as appropriate clear areas are designated around operating weaponry or radars to preclude injury to any persons. Therefore, implementation of alternative 2 is expected to have less than significant impacts on health and human safety.

#### 3.6.2.3 No Action Alternative

Under the no action alternative, none of the proposed weapons systems would be stationed or fielded at Fort Sill and the Army would not enhance its structural MDO capabilities. Training activities and staffing conditions would remain consistent with current conditions. Therefore, implementation of the no action alternative would not result in significant impacts to human health and safety.

## 3.7 Land Use

Land use describes the way the natural landscape has been modified or managed to provide for human needs. In developed and urbanized areas, land uses typically include residential, commercial, industrial, utilities and transportation, recreation, open space, and mixes of these basic types. Other uses such as mining, extractive activities, agriculture, forestry, and specially protected areas (such as larger monuments, parks, and preserves) are usually found on the fringes of or outside of urbanized areas. Plans and policies guide how land resources are allocated and managed to best serve multiple needs and interests. Federal, state, and local statutes, regulations, plans, programs, and ordinances define specific limitations on uses.

Federal statutes and regulations that govern or influence land use at military installations include NEPA, Comprehensive Environmental Response, Compensation, and Liability Act, Resource Conservation and Recovery Act (RCRA), and the ESA. While the Federal Land Policy and Management Act (FLPMA) does not directly govern military lands, it becomes applicable when public lands are withdrawn for military use or when military activities affect adjacent Bureau of Land Management lands. Regarding this project, FLPMA is relevant because the proposed action has the potential to impact adjacent Bureau of Land Management lands, requiring coordination to ensure compliance with FLPMA provisions, which support proper land management and environmental stewardship.

NEPA processes such as this PEA are required for land use planning and significant land use changes at military installations. The Comprehensive Environmental Response, Compensation, and Liability Act can impose restrictions to protect human health and the environment. RCRA affects land use through waste management and remediation requirements. ESA mandates protection of endangered species and their habitats, which can limit land use activities. FLMPA governs public land management, including lands used by the DoD, requiring consideration of multiple-use management in land use planning. Additionally, DoD policies and regulations, such as those found in the Unified Facilities Criteria, guide the planning, design, construction, and sustainment of military facilities.

State statutes, rules and regulations include the Oklahoma Environmental Quality Code, which governs environmental protection, air and water quality standards, waste management, and land reclamation. The Oklahoma Land Use Regulations establish state-level policies on zoning and development, potentially affecting areas adjacent to and near Fort Sill. Additionally, the Oklahoma Department of Wildlife Conservation oversees wildlife and habitat protection, which may impact land use and development decisions adjacent to and on Fort Sill.

Regulations that guide land use at the installation level include the Fort Sill INRMP, and the Fort Sill Range Complex Master Plan. The Fort Sill INRMP outlines the management of natural resources on the installation, balancing military mission requirements with environmental stewardship. The Real Complex Master Plan is a comprehensive plan for the development and management of land and facilities on the installation. A Joint Land Use Study is a collaborative planning effort between Fort Sill, surrounding communities, and other stakeholders to promote compatible land use and address issues that may impact the military mission.

Potential impacts to land use can result from actions that (1) change the suitability of a location for its current or planned use (e.g., noise exposure in residential areas), (2) cause conditions that are unsafe for range and training area usage and the public welfare, (3) conflict with the current and planned use of the area based on current zoning, amendments, agreements, regulatory restrictions, management, and land use plans, or (4) displace a current use with a use that does not meet the goals, objectives, and desired use for an area. The degree of land use effects (negligible, minor, moderate, or significant) is based on the level of land use sensitivity in areas affected by a proposed action, the magnitude of change, and the compatibility of a proposed action with existing or planned land uses.

### 3.7.1 Affected Environment

Fort Sill spans approximately 93,679 acres, consisting of 7,066 acres of cantonment area and 85,985 acres of rangeland, which is divided into three ranges: East, West, and Quanah. From a natural resources perspective, these divisions are significant because the ranges are ecologically distinct, particularly along the boundary between the East and West ranges (Fort Sill, 2020b).

#### 3.7.1.1 Training, Impact, and Demolition Areas and Ranges

About 72,925 acres (78 percent of the installation) are available for various types of field training. The areas include all land except target, demolition, cantonment areas, leased land, the landfill, and the Lake Elmer Thomas Recreation area.

Fort Sill's ranges (Figure 3-1) provide training opportunities to develop and improve soldier and team proficiency and competence in the use of sophisticated weaponry. Fort Sill has 44 ranges, 82 training areas, 28 training sites, two drop zones, and various helicopter landing zones. Many ranges are located adjacent to or within the installation's impact areas. The impact areas provide a restricted environment where access to areas potentially containing spent ammunition and unexploded ordnance can be controlled. Training sites consist of constructed facilities such as wheeled vehicle driving ranges and improvised explosive device courses, conditioning courses, and Military Operations in Urban Terrain facilities. Drop zones are used for delivery of

personnel and equipment by parachute and landing zones provide landing areas for rotary-wing aircraft (e.g., helicopters).

Training areas (Figure 3-1) are ranges that are intended for the free maneuvering of troops and equipment. Training areas may be further characterized as heavy maneuver areas and light maneuver areas. Heavy maneuver areas are training areas in which heavy vehicles (e.g., tracked vehicles) are permitted to train. Light maneuver areas are limited to wheeled vehicles and troops on foot. Additionally, some portions of military training areas are designated as foot traffic only. Certain training areas at Fort Sill can be used for recreation when they are not in use for training purposes (Leidos, Inc. 2018b as cited in Fort Sill, 2020b).

All three of the ranges at Fort Sill are managed under the Army's Sustainable Range Program core programs, the Range and Training Land Program, and the ITAM program. The Range and Training Land Program provides central management, programming, and policy for the modernization of the Fort Sill ranges and their day-to-day operations. The ITAM provides Fort Sill range officers with the capability to manage and maintain training and testing land by integrating mission requirements with environmental requirements and sound land management practices (AR 350-19).

#### 3.7.1.2 Restricted Areas

Fort Sill has four impact areas: North Arbuckle and South Arbuckle on the East Range, totaling 16,309 acres; the West Range impact area, covering 14,623 acres; and the Quanah Range impact area, which spans 7,244 acres (see Figure 3-1). In total, approximately 24,276 acres within the buffer zone of these impact areas are used for limited training (Fort Sill, 2020b).

#### 3.7.1.3 Demolition Areas

Crater Creek Demolition area is the primary demolition area on Fort Sill. Located on the southern edge of the granite outcrop in the West Range, this 1,238-acre site is dedicated solely to the demolition of hazardous duds and equipment. When not in use, the northern portion of the demolition area is open for hunting. An additional demolition area is located approximately one mile northeast of the Falcon Range, within the Quanah Range impact area. An old demolition area in the southeastern corner of South Arbuckle impact area (1,107 acres) has not been used for over 35 years (Fort Sill, 2020b).

#### 3.7.1.4 Cantonment Areas

The Fort Sill main cantonment area consists of 7,066 acres (Figure 3-1). Other improved and semi-improved lands are managed by non-appropriated fund activities (mainly the golf course and Lake Elmer Thomas Recreation Area) as well as those lands managed by Range Division, Camp Eagle, Falcon Range, and military units associated with range complexes. Many semi-improved grounds are located on firing ranges.

#### 3.7.1.5 Agricultural Lease Areas

Approximately 4,747 acres of land are available for various types of agricultural use. Most of these areas are on training lands, only a few are in the cantonment lands. Figure 3-2 depicts the

agricultural lease areas. This figure also indicates wildlife food plots, and commercial agricultural fields.

**Figure 3-1: Fort Sill Ranges and Training Areas**

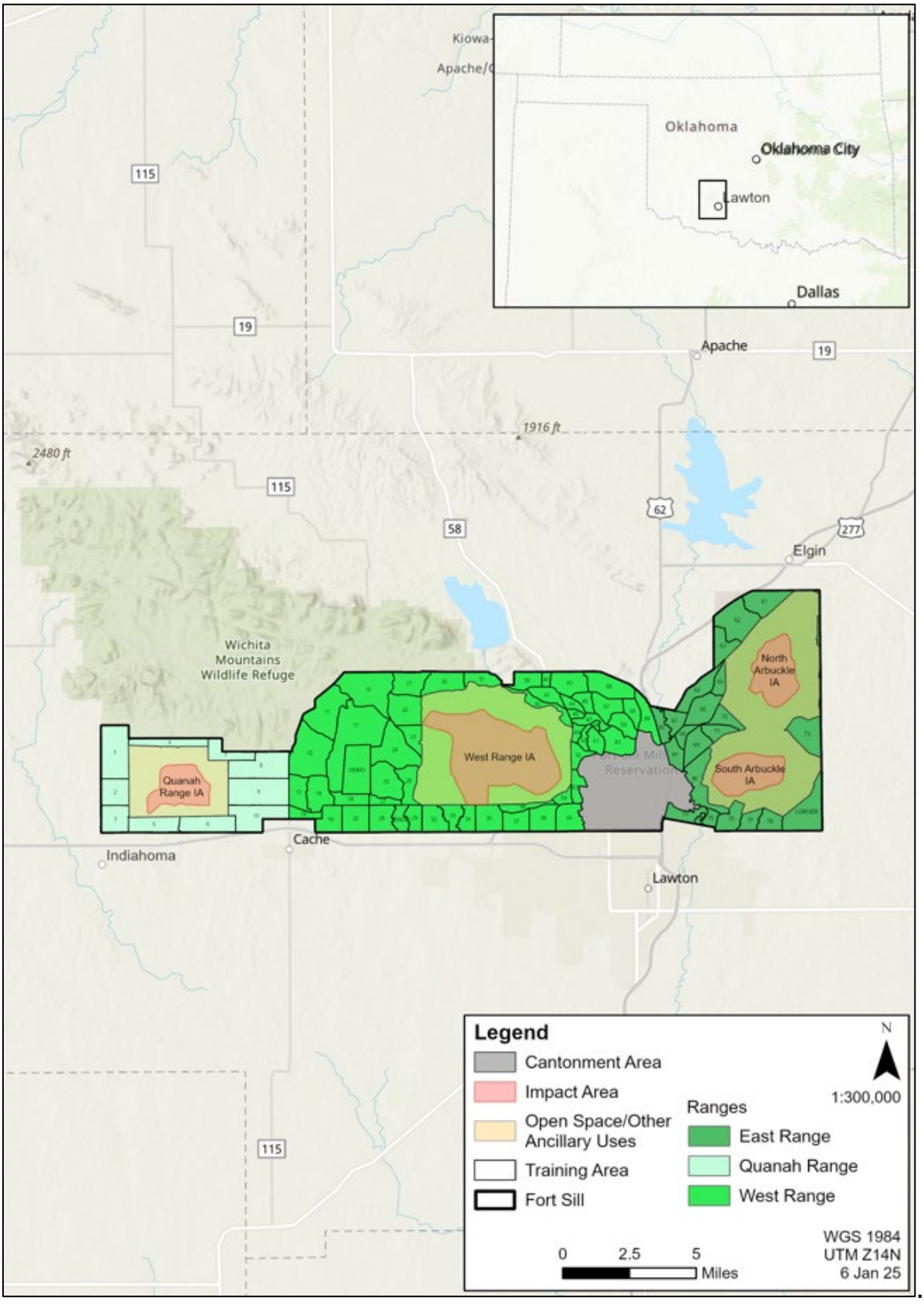
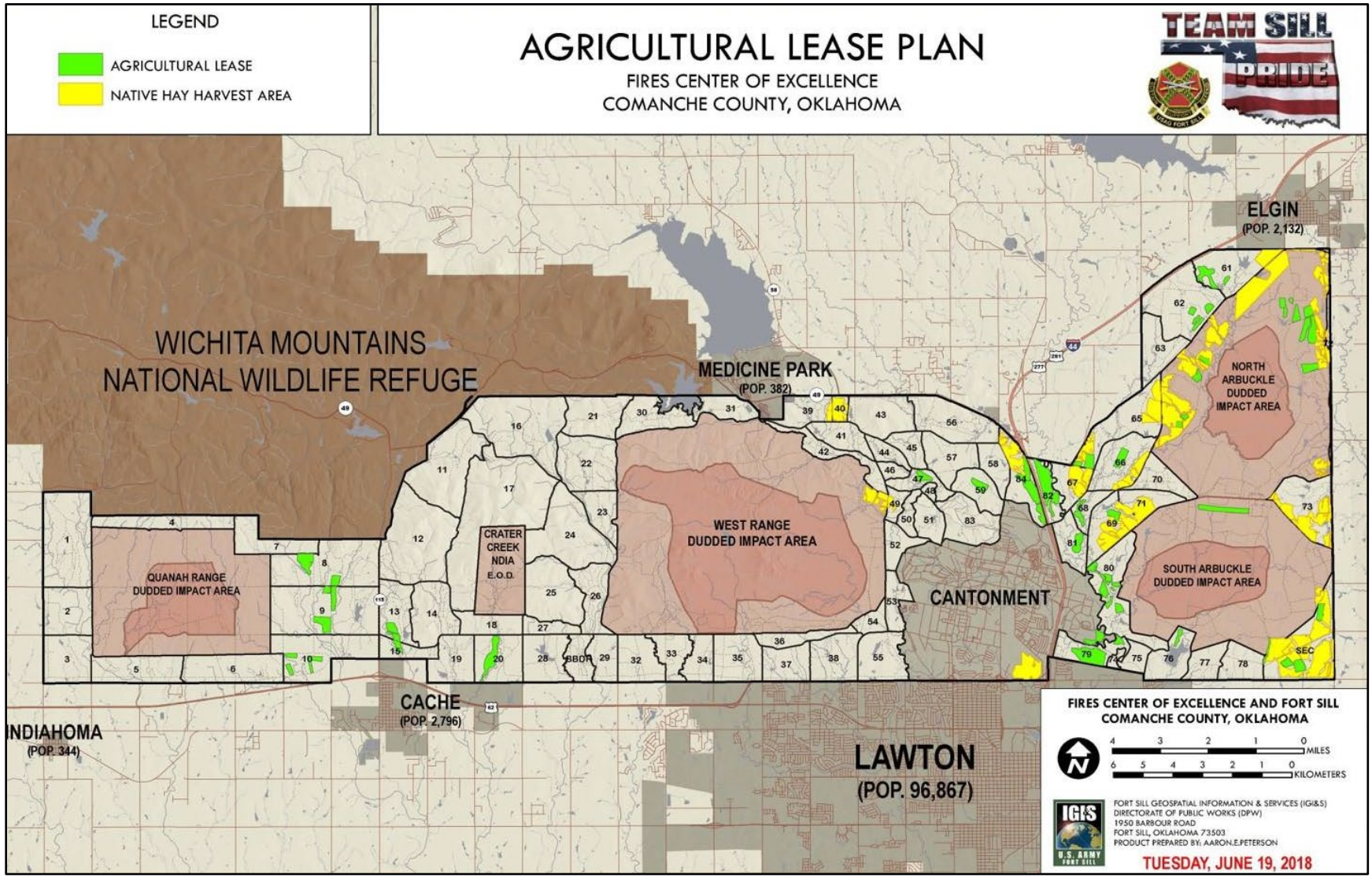


**Figure 3-2: Agricultural Lease Areas**




Source: Fort Sill INRMP (Fort Sill, 2020b)

### 3.7.2 Environmental Consequences

Impacts on land use would be considered significant if the land use were incompatible with existing military land uses and designations (including recreation) and or sufficient land is not available. These impacts could conflict with Army land use plans, policies, regulations, or with land use off post.

#### 3.7.2.1 Proposed Action – Alternative 1

Alternative 1 includes the fielding, stationing, operations, and maintenance of the IFPC and HP-DE weapons systems along with their associated soldiers to the installation.

The IFPC could be fielded as either a BN or a battery. The IFPC Battery is organized similarly to current ADA Batteries, consisting of a small Headquarters Platoon, a Launcher Platoon, a Fire Control/Radar Platoon, and a system support section. The types of equipment and approximate quantities that are fielded with the IFPC BN are shown in Table 1-1 (see Section 1.1.2.3). The IFPC system would be housed in existing infrastructure or new infrastructure would be provided before fielding the IFPC BN. If construction for support facilities is required, supplemental NEPA documentation may be required before beginning construction.

Fielding, stationing, operating, and maintaining the IFPC BN or Battery could cause impacts on land use. New support facilities, if required, could cause land use changes and the Real Property Branch in the Master Planning Division of the DPW may have to update current master plans to account for land use changes related to new or changed facilities.

The HP-DE weapon systems are future weapons of the existing DIVAD BN and proposed IFPC BN or Battery. These include the IFPC DE and M-SHORAD Inc 2 (DE). The IFPC-HEL is a truck-mounted, 300-kW laser. The IFPC-HPM is a ground-based system that can be loaded onto available trailers or other load-handling vehicles. Fielding of these systems is expected to occur on existing training areas and ranges, however, if new infrastructure or range space is needed, supplemental NEPA documentation may be required before beginning construction. Fielding, stationing, operations, and maintenance of the HP-DE weapons system could also cause impacts on land use if existing SDZs are inadequate. The development of new SDZs for the operation of the IFPC DE may alter the land use of adjacent parcels. The DPW Real Property Branch may have to update current master plans to account for land use changes related to new or changed SDZs.

Agricultural leases on Fort Sill are shown on the map (Figure 3-2) and marked by the Natural Resources Branch with Siebert stakes. Most of these lease areas are designated as 'no maneuver areas,' and the remaining areas are labeled as 'dismounted maneuver areas' to minimize impacts on agricultural activities. The proposed systems would be used within existing training areas, therefore agricultural lands would not be impacted.

The fielding, stationing, operations, and maintenance of the weapons systems proposed under alternative 1 could impact land use at Fort Sill. These impacts largely depend on the exact locations where the systems would be stored, and whether existing facilities are adequate or new facilities are required. Specific details regarding weapons systems storage are unavailable

within the scope of this PEA, so future NEPA documentation may be required for a full analysis. However, the available training space is adequate, and land use designations for training areas will remain unchanged.

The land capacity at Fort Sill is sufficient to support the new weapons systems, as approximately 78 percent of the installation is available for various types of field training activities. The primary challenge is not land availability but the potential for conflicting training uses. Range Operations mitigates this by holding monthly and quarterly deconfliction meetings. With proper coordination between Real Property Management, and Range Operations, and others, changes in land use and increased training activities would not conflict with Army land use plans, policies, regulations, or off-post land use. Therefore, the potential impacts on land use under alternative 1 are less than significant.

#### 3.7.2.2 Proposed Action – Alternative 2

Alternative 2 includes the fielding, stationing, operations, and maintenance of the LRHW, MRC, IFPC, HP-DE, and LTAMDS weapons systems, along with their associated soldiers to the installation. The potential impacts on land use from the fielding, stationing, operations, and maintenance of the IFPC and HP-DE are discussed under alternative 1. The impacts listed under alternative 1 apply to this alternative as well and are considered in the final assessment of the level of impact. However, this section will only discuss the LRHW, MRC, and LTAMDS to avoid redundancy.

The LRHW and MRC Batteries are expected to be housed in existing infrastructure. However, if new support facilities are required, then the DPW Real Property Branch may have to update current master plans to account for land use changes related to the new or changed facilities. Supplemental NEPA documentation might be required before beginning construction on any new infrastructure. The LTAMDS would be a one-for-one replacement for the PATRIOT AN/MPQ-65 radar, which is currently stationed at Fort Sill. The LTAMDS is not expected to require an increase in personnel or construction of new facilities.

The fielding, stationing, operations, and maintenance of the weapons systems proposed under alternative 2 could impact land use at Fort Sill, depending on the locations where the systems would be stored, and whether existing facilities are adequate or new facilities are required. Specific details regarding weapons systems storage are unavailable within the scope of this PEA, so future NEPA documentation may be required for a full analysis. However, the available training space is adequate, and land use designations for training areas will remain unchanged.

The land capacity and potential land use changes described for alternative 2 are likely to be compatible with existing land uses and designations at Fort Sill. The installation has sufficient training land, with approximately 78 percent available for various field training activities. The primary challenge is not the availability of land, but the potential for overlapping land uses. Range Operations addresses this by holding monthly and quarterly deconfliction meetings. With proper coordination between Range Operations and Real Property Management, and others, potential land use changes and increased training would not conflict with Army land use plans, policies, regulations, or off-post land use. Therefore, the impacts on land use under alternative 2 are expected to be less than significant.

#### 3.7.2.3 No Action Alternative

Under the no action alternative, none of the proposed weapons systems would be stationed or fielded at Fort Sill and the Army would not enhance its structural MDO capabilities. Training activities and staffing conditions would remain consistent with current conditions. Therefore, implementation of the no action alternative would not result in significant impacts to land use.

## 3.8 Utilities

In the context of a NEPA analysis, utilities refer to the facilities and infrastructure, the physical systems and structures available on or near Fort Sill that would support the implementation of the proposed action at Fort Sill. The relevant systems and associated infrastructure considered in this PEA are potable water, wastewater (including blackwater and greywater), stormwater, solid waste, and energy. This analysis assesses the potential impacts of the proposed action on these utility services and infrastructure, considering factors like capacity, reliability, and any required modifications or upgrades.

Applicable federal laws and regulations include the Safe Drinking Water Act. This act ensures the quality of Americans' drinking water and may impact infrastructure related to water utilities. The Clean Air Act regulates air emissions from stationary and mobile sources and can influence utilities related to energy production and consumption. RCRA governs the disposal of solid and hazardous waste, impacting waste management utilities. The Energy Policy Act addresses energy production in the U.S., including energy efficiency, renewable energy, and the regulation of energy utilities. Lastly, the Telecommunications Act of 1996 regulates telecommunications utilities to ensure the provision of communication services.

The Clean Water Act created the National Pollutant Discharge Elimination System (NPDES) in 1972. The NPDES permit program addresses water pollution by regulating point sources that discharge pollutants into the Waters of the United States. The NPDES permit program is authorized by state governments by the USEPA to perform permitting, administrative, and enforcement aspects of the program.

Key regulations and governing bodies relevant at the local level include the Oklahoma Department of Environmental Quality, which provides water and air quality standards, and waste management regulations. Another relevant governing body is the Oklahoma Corporation Commission, which oversees electric, gas, and telecommunication utilities. The Oklahoma Water Resources Board and Oklahoma Department of Transportation provide water rights/permits and infrastructure permits respectively.

Installation and military regulations include DoD Instructions, 4170.11 (*Installation Energy Management*), 4715.03 (*Environmental Compliance*), and 4165.57 (*Sustainable Development*). 4170.11 establishes policies and procedures for managing energy resources at military installations. DoD Instruction 4715.03 provides guidelines for ensuring environmental compliance at military installations, including utility operations. DoD Instruction 4165.57 promotes sustainable development practices, including efficient utility use and infrastructure planning. These instructions work in conjunction with the Unified Facilities Criteria, which provides detailed technical criteria and standards for designing, constructing, and maintaining

utility systems on military installations. In addition to this, all installations have a Master Plan that includes guidelines for utility infrastructure development, maintenance, and upgrades.

### 3.8.1 Affected Environment

#### 3.8.1.1 Water – Stormwater, Wastewater, and Potable Water

Fort Sill receives potable water from the City of Lawton under a contract that stipulates a supplied pressure independent of volume or flow (Fort Sill, 2019). Lake Lawtonka and local groundwater are the primary sources of water for Fort Sill, the City of Lawton, and surrounding rural areas (City of Lawton, 2024).

Wastewater (including black and greywater) generated at Fort Sill is delivered to the Fort Sill wastewater treatment system, which is owned and operated by American Water Enterprises. American Water Enterprises is responsible for maintaining all lift stations, making improvements to the sewer system, reporting violations, and strengthening controls. The Fort Sill wastewater treatment plant discharges treated wastewater to East Cache Creek under a NPDES permit (Fort Sill, 2019).

The stormwater system at Fort Sill consists of storm drains, underground piping, and various surface water features (i.e., ditches, creeks, swales, retention basins). Stormwater from the cantonment area drains into 30 major outfalls that subsequently discharge to Medicine Creek, Sitting Bear Creek, Wolf Creek, Mission Creek, and Cache Creek (Fort Sill, 2019).

#### 3.8.1.2 Solid Waste

Fort Sill currently utilizes the 370-acre Dodge Hill Landfill located on the eastern portion of the installation. This landfill includes a municipal solid waste (MSW) unit, a construction and demolition (C&D) debris unit, and a permitted compositing facility. MSW (i.e., residential, commercial, or institutional solid wastes) generated at the installation are disposed of at the MSW landfill unit. As of 2015, the Dodge Hill Landfill was expected to reach its capacity in approximately 24.3 years, indicating that today there would be approximately 15 years of capacity remaining (Fort Sill, 2015). Off-site recycling facilities are also available (Fort Sill, 2019).

C&D waste typically includes lumber, reinforcing steel, pipes, wires, asphalt, and other debris generated by demolition of old buildings, renovation, 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. Debris not utilized for erosion control would be sent to the Fort Sill C&D landfill unit.

#### 3.8.1.3 Energy

All of the primary electric power used by Fort Sill is supplied by the Public Service Company of Oklahoma (PSO), a subsidiary of American Electric Power, which provides electricity to approximately 547,000 customers across southwestern Oklahoma. Electric power is distributed throughout the installation via a government-owned distribution system. Some building-specific emergency generators that are already located on the installation provide backup power for

emergency and essential loads. Resiliency loads were determined by what is needed to support current critical missions and potential future growth in the event of a major power outage (Fort Sill, 2019). From FY 2023 to 2024 PSO generated 18,981,450 megawatt hours (PSO, 2024). The peak energy demand usually occurs during the summer.

Wind energy makes up approximately 57 percent of the Comanche County energy profile while natural gas contributes the other 43 percent. Collectively, wind and natural gas generate 657,567 megawatt hours. Fort Sill authorized the construction, operation, and maintenance of an up to 15-acre Reciprocating Internal Combustion Engine facility in 2019; however, the facility has not yet been constructed.

### 3.8.2 Environmental Consequences

Impacts to utilities would be considered significant if the proposed action were to cause an impairment of service to the installation and local communities, homes, or businesses.

#### 3.8.2.1 Proposed Action – Alternative 1

Alternative 1 includes the fielding, stationing, operations, and maintenance of the IFPC and HP-DE weapons systems along with their associated soldiers to the installation.

The IFPC BN is anticipated to be accompanied by approximately 735 new soldiers. According to military demographic data, the new soldiers would be accompanied by approximately 1,304 family members including spouses and children. This indicates that the fielding, stationing, operations, and maintenance of the IFPC could cause a population increase of about 2,039 people. Fort Sill is a large installation with a total population of approximately 53,000, including 20,000 military and civilian personnel and 33,000 military family members (DoD, 2024). Considering the size of the base population the fielding, stationing, operations, and maintenance of the IFPC BN alone would cause only a 3.8 percent population increase. An increase in population of this size would not cause any new or excessive strain on the utilities at Fort Sill.

Should the IFPC require new facilities for storage or housing for its accompanying soldiers, existing utilities might need to be connected to new construction. Supplemental NEPA documentation could be required before beginning construction on any new facilities with further analysis of the impacts on utilities.

The HP-DE systems are not anticipated to be accompanied by any new soldiers. The IFPC DE Platoon soldiers would transition from IFPC kinetic energy systems to the IFPC DE. The M-SHORAD Inc 2 (DE) would utilize soldiers already assigned to the DIVAD BN stationed at Fort Sill. The fielding, stationing, operations, and maintenance of the HP-DE systems would have no impact on utilities at the installation as current utility capacities can support the systems' demands.

The fielding, stationing, operations, and maintenance of the weapons systems proposed under alternative 1 would only have a minor effect on utilities. The fielding, stationing, operations, and maintenance of the HP-DE systems would have no impact on utilities. The population increase accompanying the IFPC may drive an increased need for all utilities. However, considering the

minor population increase (3.8 percent) this impact is less than significant. Therefore, the implementation of alternative one is expected to have less than significant impacts on utilities.

#### 3.8.2.2 Proposed Action – Alternative 2

Alternative 2 includes the fielding, stationing, operations, and maintenance of the LRHW, MRC, IFPC, HP-DE, and LTAMDS weapons systems, along with their associated soldiers to the installation. The potential impacts on utilities from the fielding, stationing, operations, and maintenance of the IFPC and HP-DE are discussed under alternative 1. The impacts listed under alternative 1 apply to this alternative as well and are considered in the final assessment on the level of impact. However, to avoid redundancy, this section will only discuss the LRHW, MRC, and LTAMDS.

The LRHW, MRC, and LTAMDS are not expected to impact utilities directly, the current capacities of Fort Sill should accommodate the fielding, stationing, operations, and maintenance of the systems. The impacts on utilities are expected to be caused by the increase in personnel and accompanying family members associated with the new weapons systems.

The fielding, stationing, operations, and maintenance of the LRHW, MRC, IFPC, HP-DE, and LTAMDS weapons systems would require the support of approximately 865 to 925 soldiers. Using the upper limit of anticipated soldiers, an estimated 1,249 family members, including spouses and children, might accompany the soldiers. This could result in an overall increase of 2,174 people to the Fort Sill population. When compared to the total current Fort Sill population (53,000) this represents a 4.1 percent increase in the population. The increase in population could increase utility demand and the construction of additional infrastructure may be necessary. Specific utility demand and infrastructure improvement requirements cannot be quantified until specific facility and housing requirements are known. Supplemental NEPA documentation may be required before beginning construction.

The fielding, stationing, operations, and maintenance of the weapons systems proposed under alternative 2 could affect utilities at Fort Sill. The fielding, stationing, operations, and maintenance of the weapons systems themselves are expected to have no impact on utilities, as existing utility capacities are adequate for the needs of the systems. The population increase associated with the weapons systems may lead to a greater demand for all utilities. However, the existing utility capacity is expected to accommodate this increase. Therefore, the potential impacts on utilities under alternative 2 are less than significant.

#### 3.8.2.3 No Action Alternative

Under the no action alternative, none of the proposed weapons systems would be stationed or fielded at Fort Sill and the Army would not enhance its structural MDO capabilities. Training activities and staffing conditions would remain consistent with current conditions. Therefore, implementation of the no action alternative would not result in significant impacts to utilities.

## 3.9 Water Resources

Water resources include surface water, groundwater, wetlands, and floodplains. Surface water resources include lakes, ponds, rivers, and creeks. These resources are important for a variety

of reasons, including economic, ecological, recreational, and human health factors. Groundwater includes the subsurface hydrologic resources of the physical environment; its properties are often described in terms of depth to aquifer or water table, water quality, and surrounding geologic composition. Wetlands are areas of transition between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is covered by shallow water. Floodplain refers to the lowland and relatively flat areas adjoining inland and coastal waters, including, at a minimum, that area subject to a one percent or greater chance of flooding in any given year.

For the purposes of this water resources analysis, the ROI consists of the water resources that are within and downstream or downgradient of the footprint of operations related to the stationing of the various weapons systems at Fort Sill. Fort Sill has a diversity of habitats that support a rich and diverse array of aquatic fauna. Supplement 1.4.1a of the INRMP lists fish, amphibians, mussels, and special interest species known to occur on Fort Sill. Due to the large number of invertebrates (except mussels), including many aquatic species, these lists are maintained in Natural Resources and Enforcement Branch files (Fort Sill, 2020b).

### 3.9.1 Affected Environment

#### 3.9.1.1 Surface Water

Surface water in this region consists of three major streams that flow into the Red River: Deep Red Creek, Cache Creek, and Beaver Creek. Cache Creek has two main forks that extend across Fort Sill from north to south: East Cache Creek and West Cache Creek. Fort Sill is mostly in Basin 28 (East Cache Creek) and Basin 29 (West Cache Creek), and a small portion is in Basin 25 (Beaver Creek) of the Beaver-Cache Watershed Planning Region (Oklahoma Water Resource Board [OWRB], 2012). Deep Red Creek and its watershed (Basin 30) is located southwest of Fort Sill.

There are 219 ponds and lakes on Fort Sill, ranging in size from less than 1 acre to the 333-acre Lake Elmer Thomas (Fort Sill, 2020b). Lake Elmer Thomas is located on the northern boundary of Fort Sill and extends into the WMWR. Other important lakes and ponds include West Lake, Lake George, Ketch Lake, Menard Pond, Engineer Pond, Logan Pond, and Pottawatomie Twins Pond. Lake Ellsworth and Lake Lowtanka, located north of the installation, are used for potable water supply by Fort Sill and the City of Lawton (Fort Sill, 2020b; Figure 3-3).

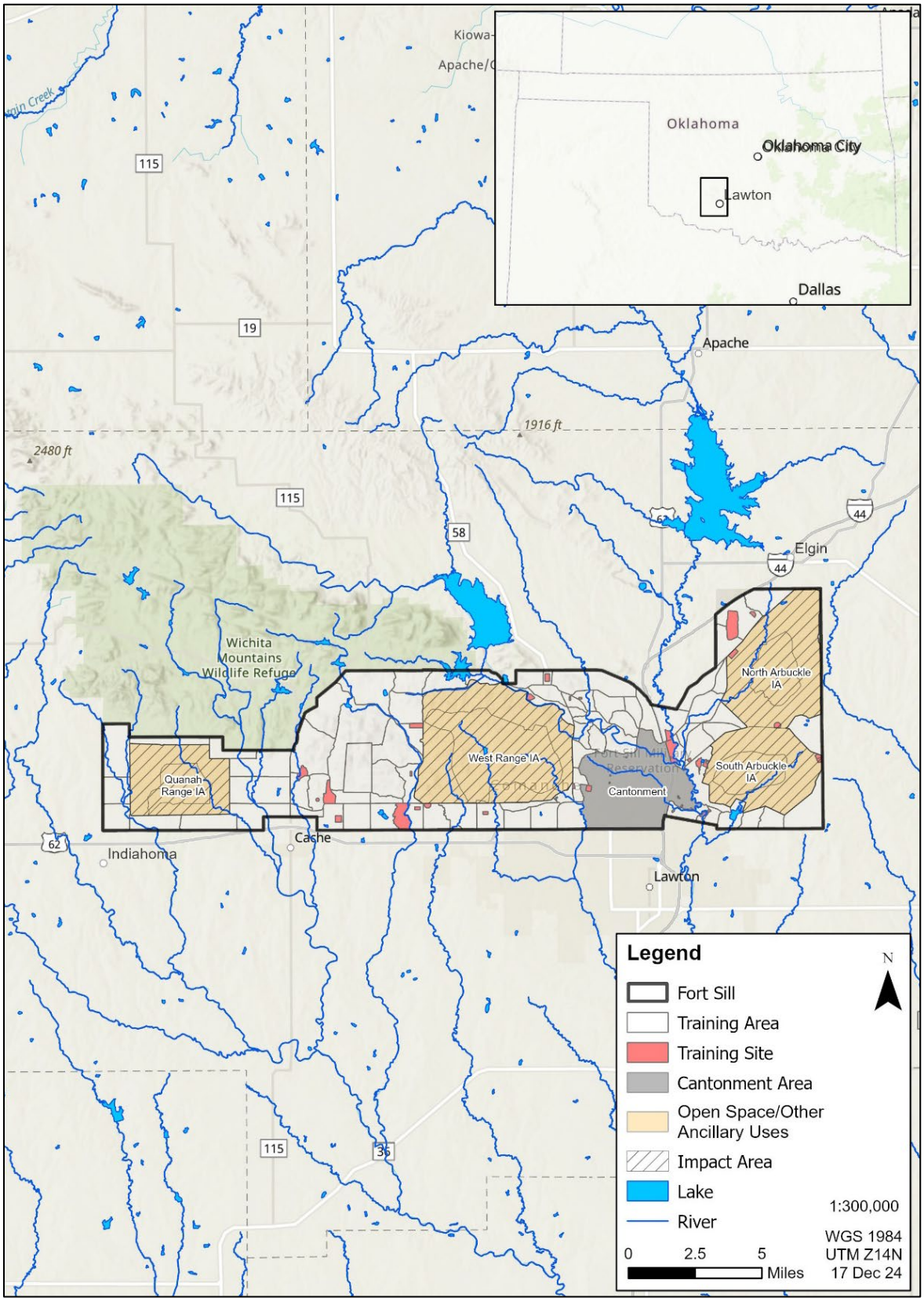
#### 3.9.1.2 Groundwater

The major aquifer in Comanche County including the Fort Sill area is the Arbuckle and Timbered Hills Group bedrock aquifer (OWRB, 2022a). Minor aquifers are the Post Oak Conglomerate bedrock aquifer and alluvial aquifers associated with Cache Creek and Beaver Creek (OWRB, 2022b). The state of Oklahoma defines major bedrock and alluvial aquifers as being capable of yielding on average at least 50 and 150 gallons per minute, respectively.

The Arbuckle and Timbered Hills Group bedrock aquifer consists of limestone and dolomite interbedded with some sandstone and shale and has a maximum thickness of about 5,000 to 6,000 feet. Wells commonly yield 25 to 600 gallons per minute of groundwater that is of good to

fair quality (generally 300 to 2,000 milligrams per liter of dissolved solids) (Oklahoma Geological Survey, 1993). Recharge is principally along the southern flank of the Wichita Mountains north of Fort Sill and through the overlying Post Oak Conglomerate.

**Figure 3-3: Water Resources at Fort Sill**



The Post Oak Conglomerate consists of limestone conglomerate interbedded with sand, silt, clay and shale, has an average thickness of 500 feet and estimated typical yield of 50 gallons per minutes (U.S. Army Corps of Engineers, 2023).

Alluvial aquifers are comprised of sand, clay, and gravel along floodplains of Cache Creek and Beaver Creek. The average thickness of the alluvial aquifers is estimated to be 19 feet. Water yields vary from 5 to 500 gallons per minute, but the reported typical well yield is estimated at 77 gallons per minute (U.S. Army Corps of Engineers, 2023). Recharge is through precipitation on floodplains and stream bed infiltration.

#### 3.9.1.3 Wetlands and Floodplains

The Clean Water Act protects water bodies and stream channels that are under its jurisdiction. Waters of the United States range from small emergent wetlands associated with ephemeral streams to large, forested wetland complexes adjacent to perennial channels. Waters of the United States, including wetlands, exist across the installation.

Wetlands on Fort Sill were inventoried through the evaluation of aerial photography from February 1983 and March 1984. In 1995, the USFWS verified this evaluation from 1995 aerial photography of the installation. This verification resulted in the identification of 1,174 acres of potential wetlands on Fort Sill (Fort Sill, 2020b). Wetlands are present in the training areas that would be used during training.

The primary concern regarding floodplains is construction within and loss of floodplain capacity. Actions within wetlands and floodplains should be avoided when a practicable alternative exists that would not impact these areas. EO 11988, *Floodplain Management*, was enacted on May 24, 1977, to set guidelines to avoid the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. Additionally, EO 11990, *Protection of Wetlands*, issued on May 24, 1977, aims to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance their natural and beneficial values.

The 100-year floodplains on Fort Sill have been mapped for East and West Cache Creeks and their major tributaries. Floodplain areas are present in some of the training areas that would be used during training (Federal Emergency Management Agency, 2009, 2016).

### 3.9.2 Environmental Consequences

Impacts on water resources would be considered significant if the proposed action introduces pollutants that directly degrade water quality standards of a surface water body, alter patterns of or increase the intensity of flood water movement, or violate federal or state discharge permits.

#### 3.9.2.1 Proposed Action – Alternative 1

Alternative 1 includes the fielding, stationing, operations, and maintenance of the IFPC and HP-DE weapons systems along with their associated soldiers to the installation. Impacts to water resources resulting from alternative 1 are anticipated to be largely driven by increased training impacts and increased population. Given these are the primary issues analyzed, the Fort Sill

2023 M-SHORAD Stationing EA (U.S. Army Corps of Engineers, 2023) is used as an analysis tool for this alternative. These impacts are expected to be less than significant due to the small increases in the training area, use of existing facilities, and the existing BMPs and control measures employed by the Army.

The increase in the number of weapons systems and associated personnel might require additional infrastructure or expanded training areas. The limits, location, and design of this potential construction are not yet known. If new construction is required to implement this alternative, supplemental NEPA analysis may be required.

*Groundwater*

Measures in place to protect Fort Sill's surface waters would also protect aquifers from contamination. Sampling and analysis of soil and sediment in ranges can be used to evaluate whether munitions constituents can potentially leach from the soil and vertically migrate to underlying groundwater. Spill containment and prevention measures in the Spill Prevention, Control, and Countermeasures Plan and Installation Spill Contingency Plan as well as BMPs and good housekeeping required in the Stormwater Management Plan would prevent contaminants from reaching the aquifers in the area (Fort Sill, 2020b). Implementation of alternative 1 is expected to have less than significant impacts on groundwater.

*Wetlands and Floodplains*

Construction is not anticipated under alternative 1. If new facilities are required, they would likely be situated within existing cantonment areas and would avoid wetlands and floodplains. Wetlands do occur in the training areas. However, these would be protected by coordinating various training activities with EQD to ensure that area wetlands would not be damaged by the training operations. Fort Sill Regulation 385-1 provides for the protection of wetlands from military and civilian damage. Restrictions include designating ponds and lakes as off-limits, not allowing equipment use within 200 meters of ponds and lakes and requiring mechanized equipment to cross waterways at 90-degree angles (Fort Sill, 2020b). Such restrictions enhance the protection of wetlands on Fort Sill and would be protective should any of the proposed units be stationed at Fort Sill (Fort Sill, 2020b).

*Impacts from Increase in Personnel*

The addition of the IFPC and HP-DE could require additional facilities such as headquarters buildings or vehicle maintenance shops and increase the routine use of potential contaminants. These facilities would be provided with storm drainage systems. At vehicle maintenance shops, the drainage system would incorporate modern oil-water separators; repair activities would be performed indoors to avoid stormwater exposure; petroleum, oil, and lubricants and hazardous waste storage facilities would be designed to preclude pollutant runoff. Increased industrial activity under the proposed action could result in a greater probability of accidental spills. Increases in personnel could result in increases in trash and debris that could inadvertently wind up in local waterways. These impacts are expected to be less than significant because the proper design of drainage control measures would minimize the accumulation of pollutants and debris in nearby waterways.

Fort Sill mitigates the negative effects of maneuver training through coordination of training activities with the EQD (U.S. Army Corps of Engineers, 2018) and adherence to the ITAM program. Prior to training, proposed training activities and training site locations are coordinated with the EQD to screen for and avoid sensitive areas. The practice of coordination with the EQD would be implemented with all of the maneuver training activities. Furthermore, soil management at Fort Sill is accomplished through the Land Rehabilitation and Maintenance aspect of the Army's ITAM program (Fort Sill, 2020b). Under this program, Fort Sill implements BMPs and training restrictions to minimize erosion and sedimentation issues.

Activities related to increased personnel, and increased maneuvering could take place within a floodplain. Building within a floodplain could exacerbate flooding, pose greater risks to soldier safety, increase the chance of inundation and facility damage, and introduce contaminants into floodwaters. The Army aims to avoid activities and construction within floodplains. If avoidance is not feasible, a Finding of No Practicable Alternative would be required in accordance with EO 11988. This would also require a project-specific analysis consistent with EO 11988, which directs federal agencies to avoid adverse impacts in floodplains where applicable. Agencies must determine whether a proposed action is located in a floodplain, evaluate alternatives to avoid floodplain development, and, if no practicable alternative exists, minimize potential harm. The analysis must consider the best available data and methods for assessing flood hazards and floodplain boundaries.

Additionally, the Army adheres to Section 438 of the Energy Independence and Security Act of 2007, which mandates that projects involving federal facilities with footprints exceeding 5,000 square feet incorporate site planning, design, construction, operation, and maintenance strategies to maintain or restore, to the extent technically feasible, the predevelopment hydrology of the site concerning temperature, rate, volume, and duration of flow. During the design phase for each action, more detailed studies would be conducted to assess the capacity of existing conditions and identify any additional measures needed due to new construction.

Expected impacts to floodplains are anticipated to be less than significant if adherence to the above orders is followed. Further, the Army would strive to avoid floodplains when possible and employ site design and construction standards and BMPs as prescribed in the INRMP to minimize impacts at any sites within the floodplain.

Overall, the stationing, fielding, operations, and maintenance of the weapons systems under alternative 1 are expected to have minimal impact on water resources. Increased training activities and population have the potential to impact water resources at Fort Sill, but due to acting BMPs and control measures, the impacts are anticipated to be minor (Fort Sill, 2020b). Therefore, implementation of alternative 1 is expected to have less than significant impacts on water resources.

#### 3.9.2.2 Proposed Action – Alternative 2

Alternative 2 includes the fielding, stationing, operations, and maintenance of the LRHW, MRC, IFPC, HP-DE, and LTAMDS weapons systems, along with their associated soldiers to the installation. Impacts on water resources resulting from alternative 2 are driven by increased population, associated construction activities, and increased training impacts. Given these are

the primary issues analyzed, the Fort Sill 2023 M-SHORAD Stationing EA (U.S. Army Corps of Engineers, 2023)is used as an analysis tool for this alternative. These impacts are expected to be less than significant due to the overall increases in training, use of existing facilities, and the existing BMPs and control measures employed by the Army.

Many of the impacts to water resources considered in alternative 1 are the same for this alternative. This analysis focuses only on the unique aspects of this alternative while assuming the impacts from alternative 1 remain. The primary difference between the alternatives is the increase in population. The implementation of management and minimization measures consistent with the Fort Sill INRMP, as well as the utilization of existing BMPs, would help mitigate these impacts.

The addition of the weapons systems and associated personnel increases might require additional infrastructure or expanded training areas. The limits, location, and design of this potential construction are not yet known. If new construction is required to implement this alternative, supplemental NEPA analysis may be required.

*Impacts from Increase in Personnel*
Under alternative 2, the installation population could increase by approximately 4.1 percent, based on estimates of the required soldiers and their families for this alternative. All water resource impacts would be related to training activities. The implementation of management measures consistent with the INRMP is expected to reduce potential impacts. Additionally, applying the minimization measures outlined in the INRMP would further minimize impacts to water resources.

Minor impacts to water resources at Fort Sill are expected due to the increased frequency of unit maneuver and live-fire training events. The addition of up to 4.1 percent more soldiers and their families would have a minimal effect on the installation's watershed, water demand, and treatment systems, with only a slight increase in water consumption. Vehicle washing associated with the increased training is conducted using closed-loop wash racks, ensuring no significant impact on water resources.

Overall, the stationing, fielding, operations, and maintenance of the weapons systems under alternative 2 would have minimal impact on water resources. Although increased training activities and population have the potential to impact water resources on Fort Sill, the implementation of BMPs and control measures would minimize these impacts. Therefore, implementation of alternative 2 is expected to have less than significant impacts on water resources.

#### 3.9.2.3 No Action Alternative

Under the no action alternative, none of the proposed weapons systems would be stationed or fielded at Fort Sill and the Army would not enhance its structural MDO capabilities. Training activities and staffing conditions would remain consistent with current conditions. Therefore, implementation of the no action alternative would not result in significant impacts to water resources.

# 4 REASONABLY FORESEEABLE EFFECTS

This section provides decision makers with the reasonably foreseeable effects of the proposed action at Fort Sill, as well as the incremental contribution of past, present, and reasonably foreseeable future actions.

Table 4-1 summarizes past, present, and reasonably foreseeable future actions within the region that could interact with implementation of the proposed action at Fort Sill. Table 4-1 briefly describes each identified action, presents the proponent or jurisdiction of the action and the timeframe (e.g., past, present/ongoing, future).

Past activities are those actions that occurred within the geographic scope of the proposed action that have shaped the current environmental conditions. For resources, the impacts of past actions are now part of the existing environment and are incorporated into the description of the affected environment in Chapter 3. Present/ongoing activities encompass all projects currently under construction or development within the geographic region of Fort Sill at the time of this PEA's publication. Reasonably foreseeable future actions include those planned or anticipated to take place within the area in the foreseeable future.

**Table 4-1: Past, Present, and Reasonably Foreseeable Actions at Fort Sill and Associated Region**

| *Action* | *Proponent/Location* | *Timeframe* | *Description* |
|---|---|---|---|
| ***Military Actions*** | | | |
| Creation of R-5601G and R-5601H | Fort Sill | Past | In 2014, two new areas of restricted airspace were created above Fort Sill. These include R-5601G created to the north of the installation and R-5601H created over Henry Post Army Airfield. |
| Creation of Permanent Restricted Airspace (RA) R-5602A and R-5602B | Fort Sill | Past | A new permanent RA was created in 2018 to support high-angle artillery fire and above-the-horizon laser engagements. |
| Out Year Plan, 2018 and Beyond | Fort Sill | Past, Present | Military Construction (MILCON) – Training Support Facility (completed), Reception Barracks Complex Phase 2 (completed), Advanced Individual Training Barracks Complex Phase 2 (under construction). |
| Water Crossing Improvements | Fort Sill | Future | Non-MILCON – Replace low-water crossings with box culverts throughout the installation. Improve stormwater flow and reduce flash flooding. |
| Microgrid with Backup Power | Fort Sill | Future | Construction, operation, and maintenance of a microgrid of solar PV arrays with backup a Battery Energy Storage System (BESS). |
| Reciprocating Internal Combustion Engines (RICE) Facility | Fort Sill | Future | Construction, operation, and maintenance of a RICE facility. |

| ***Local Actions*** | | | |
|---|---|---|---|
| Highway and Road Improvements | Oklahoma DOT/Comanche County | Past, Present, Future | Based on review of the Oklahoma DOT 2025-2032 8-Year Construction Work Plan several projects are scheduled for Comanche County. These projects include the extension of Goodyear Boulevard to improve connectivity for the Lawton West Industrial Park, as well as various asset preservation efforts such as pavement resurfacing and bridge rehabilitation. |
| Public Safety Facilities | City of Lawton/Lawton Industrial Development Authority (LIDA) | Past | A new public safety facility that houses the Lawton Police Department and city jail, the Central Fire Station, and the Municipal Court. The estimated 97,400 square-foot facility is located on 5.2 acres on Railroad Street immediately south of East Gore Boulevard. Construction was completed in 2022. |
| East Lake, Oak Pointe, Oak Ridge, etc. | Private Developers/City of Lawton | Past | Development of various single-family home subdivisions in and around the City of Lawton. |
| F-35A Use of Falcon Range | Air Force Reserve Command | Present | The Air Force Reserve Command has completed the beddown F-35A aircraft at Naval Air Station Fort Worth Joint Reserve Base. F-35A pilots stationed at this location may utilize Falcon Range for training purposes. |
| Blue Canyon Wind Farm | EDP Renewables | Past | The Blue Canyon Wind Farm is a multi-phase project in southwestern Oklahoma near the city of Apache in Caddo, Comanche, and Kiowa Counties. The windfarm has been operational since 2011. |

Legend: RA=Restricted Airspace, MILCON=Military Construction, PV=Photovoltaic, BESS=Battery Energy Storage System, DOT=Department of Transportation, LIDA=Lawton Industrial Development Authority; RICE=Reciprocating Internal Combustion Engines
Source: U.S. Army Corps of Engineers, 2023

## 4.1 Reasonably Foreseeable Effects Analysis

This section evaluates the reasonably foreseeable effects from past, present, and reasonably foreseeable future actions (see Table 4-1) relative to the implementation of the proposed action and alternatives.

### 4.1.1 Air Quality

Reasonably foreseeable impacts to air quality would occur if the proposed action, in conjunction with past, present, and reasonably foreseeable future actions contribute to or cause a violation of any federal, state, or local air quality standard or regulation. Reasonably foreseeable impacts to air quality would result due to the increases in air emissions from implementing any of the alternatives except the no action alternative, as long-term air emissions increase under the proposed action. Many of the past, present and future actions listed in Table 4-1 are

construction projects that would contribute emissions similar to those associated with the proposed action. Since construction activities are temporary, the combined emissions would have a temporary impact on air quality, and once construction is complete, the emissions would likely return to the more static levels, which would vary depending on the alternative selected, as described in Section 3.2.

Significant effects would occur if implementation of any of the alternatives of the proposed action, when combined with past, present and reasonably foreseeable actions would result in the violation of a local, state or federal regulation or law. The most likely violation that could occur would be related to fugitive dust, which would result in a local regulation violation. The construction activities on Fort Sill would have reduced impacts to regional air quality by employing BMPs, including dust suppression management controls, use of electric and propane-fueled construction equipment, requiring restrictions such as reduced idling of fossil-fueled construction vehicles, and implementing sustainable design criteria for infrastructure, as required by the Army's Climate Action Plan (U.S. Army, 2022). As a result, the reasonably foreseeable impacts would not be expected to result in regulatory violations and therefore would not be significant.

Construction activities would result in temporary emission increases that would not continue once the projects are completed. Some of the past, present, and reasonably foreseeable projects may result in continued long-term increases, as is likely for the increased population using the potential newly-constructed housing. Fort Sill could help reduce impacts within their own borders through the use of electric and/or propane equipment in construction and continuing to increase use of renewable energy.

### 4.1.2 Biological Resources

Reasonably foreseeable impacts on biological resources would occur if the proposed action, in conjunction with past, present, or reasonably foreseeable future actions, resulted in substantial permanent loss of net habitat, loss of species populations, or unpermitted/unlawful take of threatened or endangered species.

Implementing the proposed action would have small-scale impacts on vegetation communities but would not impact the ability to maintain existing vegetation communities. There are chances of individual mortalities during training activities; however, no population-level impacts are anticipated. The action area contains no designated critical habitat. In addition, Fort Sill implements various management strategies to conserve and protect biological resources on Fort Sill (Fort Sill, 2020b). When combined with the effects of other past, present, and foreseeable project activities as described in Table 4-1, implementation of the proposed action is unlikely to have any additional reasonably foreseeable effect on regional plant and animal populations, including threatened and endangered species. Reasonably foreseeable impacts to biological resources resulting from implementing the proposed action in conjunction with past, present, and reasonably foreseeable future actions at Fort Sill and in the surrounding region would be less than significant.

### 4.1.3 Cultural Resources

Reasonably foreseeable impacts on cultural resources would occur if the proposed action, combined with past, present, or reasonably foreseeable future actions, significantly altered NHRP listed or eligible properties, or restricted access to properties of religious or cultural significance to Tribes.

If new construction and/or conversion and repurposing of existing structures and buildings are required to facilitate any future actions, supplemental cultural resource analysis may be required. Any historic resources aged 45 years or older and any archaeological sites located within a defined APE for the implementation of an action alternative should be assessed for their NRHP eligibility and for any potential impacts resulting from future actions.

Identifying resources before any activity and applying BMPs and mitigation measures would minimize adverse effects. Increased training activities are expected to have less than significant impacts on cultural resources. Training personnel to report cultural materials, and applying BMPs mitigate potential impacts. An increase in personnel increases the chances of encountering and potentially disturbing cultural resources but SOPs and BMPs for training, identification, and protection of these resources mitigate impacts.

Reasonably foreseeable impacts to cultural resources resulting from the implementation of the proposed action in conjunction with past, present, and reasonably foreseeable future actions at Fort Sill and in the surrounding region would be less than significant.

### 4.1.4 Geological and Soil Resources

Reasonably foreseeable impacts to geologic and soil resources would occur if the proposed action, in conjunction with past, present, or reasonably foreseeable actions resulted in significant impacts to unique soil features or causes substantial soil losses. Effects would primarily be limited to unpaved roads during training operations with impacts including rutting and erosional issues. BMPs and mitigation measures would continue to be implemented to limit the overall scope of potential impacts associated with training and construction activities. Prime farmland soils would not be irreversibly converted (directly or indirectly) to nonagricultural use by the proposed training activities. Due to the limited scope of new potential impacts associated with the proposed action of this PEA, the action would have only minor effects and would not measurably add to effects from other past, present, or reasonably foreseeable future actions. Reasonably foreseeable impacts to geologic and soil resources resulting from the implementation of the proposed action in conjunction with past, present, and reasonably foreseeable future actions at Fort Sill and in the surrounding region would be less than significant.

### 4.1.5 Human Health and Safety

Reasonably foreseeable impacts on human health and safety would occur if the proposed action, in conjunction with past, present, or reasonably foreseeable actions resulted in a substantial additional risk to human health or safety including direct human exposure to hazardous conditions or a substantial increase in conditions that adversely affect public health.

Projects listed in Table 4-1 show potential benefits to human health and safety. For example, the new public safety facility, completed in 2022, enhances emergency response capabilities. Additionally, the proposed water crossing improvements that would replace low-water crossings with box culverts, reducing the risk of flash flooding throughout the installation. Reasonably foreseeable impacts on human health and safety resulting from the implementation of the proposed action in conjunction with past, present, and reasonably foreseeable future actions at Fort Sill and in the surrounding region would be beneficial and less than significant.

### 4.1.6 Land Use

Reasonably foreseeable impacts to land use would occur if the proposed action, in conjunction with past, present, or reasonably foreseeable actions resulted in land use that is incompatible with existing military land uses and designations (including recreation) and or sufficient land is not available. These impacts could conflict with Army land use plans, policies, and regulations, or with land use off post.

The potential land use changes caused by the projects listed in Table 4-1 are likely to be compatible with existing land uses and designations. Through proper coordination between Real Property Management, Range Operations, and others, potential land use changes would not conflict with Army land use plans, policies, regulations, or off-post land use. Reasonably foreseeable impacts on land use resulting from the implementation of the proposed action in conjunction with past, present, and reasonably foreseeable future actions at Fort Sill and in the surrounding region would be less than significant.

### 4.1.7 Utilities

Reasonably foreseeable impacts to utilities would occur if the proposed action, in conjunction with past, present, or reasonably foreseeable future actions causes an impairment of service to the installation and local communities, homes, or businesses.

Proposed future actions could require the construction of new facilities in the cantonment area and ranges. Potential future construction is outside of the scope of this review. However, it can be inferred that if Fort Sill has adequate infrastructure for water, sewer capacity, electricity, natural gas, and communications to sustain these projects then, utility systems to new facilities would only require short, insignificant extensions to connect new facilities to the existing network.

Reasonably foreseeable impacts to utilities resulting from the implementation of the proposed action in conjunction with past, present, and reasonably foreseeable future actions at Fort Sill and in the surrounding region would be less than significant.

### 4.1.8 Water Resources

Reasonably foreseeable impacts to water resources would occur if the proposed action, in conjunction with past, present, or reasonably foreseeable future actions causes increased sedimentation, substantially alters surface water drainage or stormwater runoff, or substantially affects groundwater. Fielding of the new systems is expected to have less than significant impacts on all water resources. Reasonably foreseeable impacts to water resources resulting

from implementation of the proposed action in conjunction with past, present, and reasonably foreseeable future actions at Fort Sill and in the surrounding region would be less than significant.

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