
# ENVIRONMENTAL ASSESSMENT FOR THE FORT SILL MANEUVER-SHORT RANGE AIR DEFENSE BATTALION STATIONING

U.S. Army Corps of Engineers, Tulsa District

Contract Number W912BV22F0027; W912BV19D0014

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## PRIVACY ADVISORY

Any personal information provided to the U.S. Army, Fort Sill Garrison, Oklahoma, is used only to identify your intent to make a comment or to fulfill requests for copies of the Environmental Assessment (EA) or associated documents. Private addresses were compiled to develop a mailing list for those requesting copies of the EA. However, only the names of the individuals making comments and their specific comments have been disclosed. Private address information has not been published in this EA or released for any purpose unless required by law.

# DRAFT
# FINDING OF NO SIGNIFICANT IMPACT

## Environmental Assessment for the Fort Sill Maneuver-Short Range Air Defense Battalion Stationing

U.S. Army Garrison Fort Sill has prepared an Environmental Assessment (EA) that analyzes and documents the environmental consequences that could result from stationing the Maneuver-Short Range Air Defense (M-SHORAD) Battalion (Bn) at Fort Sill, Oklahoma. The EA has been developed in accordance with the National Environmental Policy Act (NEPA) of 1969 (40 *Code of Federal Regulations [CFR]* §§ 1500-1508), implementing regulations issued by the President's Council on Environmental Quality (43 *Federal Register* 55990, *Regulations for Implementing the Procedural Provisions of NEPA*), and the U.S. Army (Army) (32 *CFR* 651, *Environmental Analysis of Army Actions*). This Finding of No Significant Impact (FONSI) herein references the attached EA and has been developed as the final decision document for the EA.

The EA has been prepared to present and evaluate the proposed action and alternatives, including the No Action Alternative. Air quality, noise, biological resources, cultural resources, soil and geologic resources, water resources, land use, safety, and cumulative impacts are addressed in the EA.

**PROJECT LOCATION:** The proposed location is Fort Sill, located near Lawton, Oklahoma.

**PURPOSE AND NEED:** The purpose of the proposed action is to improve the protection of tactical maneuver forces from current and future aerial threats. The Army has been building a future force structure that is shaped by new and emerging threats, technological advances, and a prevalence of joint operations. Building the future Army involves a modernization plan that relies on a capabilities-based assessment and integrated capabilities doctrine. The M-SHORAD capability is part of the implementation of an Air and Missile Defense modernization strategy that incorporates improvements in systems across the air defense portfolio. M-SHORAD systems will employ a variety of sensors and weapon systems (missiles and machine guns) to protect forward-operating maneuver forces. The M-SHORAD capability will provide maneuver forces the ability to detect and engage aerial threats before they can pose a threat to maneuver forces. The M-SHORAD is a versatile system that conducts dedicated air defense operations, organized as battalions, and assigned to a division.

Implementation of the proposed action is needed to improve the Army's dedicated air defense capability in current maneuver formations to counter short-range aerial threats. Stationing the M-SHORAD Bn at Fort Sill is necessary to establish the capabilities to provide air defense and force protection to support divisional maneuver forces in a division that it will be aligned with. The M-SHORAD Bn would simultaneously operate with current air defense systems and communication architecture on the Stryker vehicle platform.

**ALTERNATIVES:** Two alternatives were considered: the No Action Alternative and the proposed action. Descriptions of these alternatives follow.

**NO ACTION ALTERNATIVE.** Implementation of the No Action Alternative would mean that the M-SHORAD system and associated Bn, including vehicles and manpower, would not be

stationed at Fort Sill. The facilities planned to be used for the M-SHORAD Bn would continue in their current use. Although implementation of the No Action Alternative would not meet the purpose and need, the No Action Alternative serves as the baseline for the comparison of potential impacts to all resource areas. Under the No Action Alternative, the Army would not move forward with a key component of air and missile defense modernization at Fort Sill. Fort Sill would not be a part of the Chief of Staff of the Army directed effort to improve the Air Defense Artillery capabilities to protect the maneuver force and station the M-SHORAD Bn at Fort Sill.

**PROPOSED ACTION.** The proposed action includes four primary elements: (1) the stationing of approximately 550 Soldiers and associated dependents to Fort Sill, (2) the stationing of M-SHORAD vehicles, equipment, and support infrastructure on Fort Sill, (3) the utilization of buildings and facilities on Fort Sill, and (4) M-SHORAD Bn maneuver and training requirements for Fort Sill.

**M-SHORAD Personnel Requirements.** Stationing the M-SHORAD Bn at Fort Sill would require sufficient personnel to operate and maintain the M-SHORAD system and would result in an increase of approximately 550 Soldiers. An additional 20 contractor support personnel are anticipated to support the M-SHORAD system. In addition to the personnel required to support the M-SHORAD Bn, the dependents or family members of non-contractor active-duty Soldiers are also included in this analysis. Using a dependent per Soldier factor of 1.38 (U.S. Department of Defense [DoD] 2018) for the regular Army, approximately 760 dependents would accompany the active-duty Soldiers to the Fort Sill area.

**M-SHORAD Vehicles and Equipment.** Stationing the M-SHORAD Bn would require a variety of different vehicles and equipment to be located at Fort Sill. The M-SHORAD system integrates existing guns, missiles, and sensors onto a Stryker A1 combat vehicle. Up to 40 Stryker A1 combat vehicles equipped as M-SHORAD systems would be stationed at Fort Sill as part of this action. In support of the 40 M-SHORAD system vehicles, an additional 20 Stryker A1 combat vehicles equipped as Infantry Carrier Vehicles for platoon leaders and Medical Evacuation vehicles would also be stationed at Fort Sill. The MaxxPro Mine Resistant Ambush Protected vehicle could be substituted for some or all of the additional 20 Stryker A1 combat vehicles. The battalion would also include approximately 100 Joint Light Tactical Vehicles (JLTVs) and approximately 150 support vehicles such as pickup trucks, other vehicles, and trailers. The M-SHORAD Bn could also include the High-Mobility Multipurpose Wheeled Vehicles instead of the JLTVs, depending on procurement timelines and priorities. A variety of individual weapons, sensors, communications equipment, and support and maintenance equipment would also be included with the stationing action.

**M-SHORAD Buildings and Facilities.** Implementation of the M-SHORAD Bn stationing at Fort Sill would require administration buildings for headquarters facilities and offices, buildings for vehicle maintenance equipment and material storage, secure parking areas for vehicles and equipment, and buildings for barracks. For the purposes of analysis in this EA, the M-SHORAD Bn stationing at Fort Sill would utilize existing facilities and not require the construction of any new buildings. It is possible that additional facility modifications would occur in the future. The detailed requirements for these facilities are not known at this time. Once these requirements are known, additional NEPA analysis would be required.

**M-SHORAD Maneuver and Training.** Implementation of the M-SHORAD Bn stationing action would also involve maneuver training and the use of various ranges on Fort Sill. The M-SHORAD

Bn maneuver and training requirements can be met in existing Training Areas (TAs) on Fort Sill. Because the M-SHORAD vehicle is characterized as a heavy vehicle, "Maneuver Area Heavy" TAs would be utilized to support maneuver training on Fort Sill. These could include the following TAs: TAs 1–10, with limited use in 4 and 7 because of their locations, and TAs 11, 15, 16, 18, 19, 20, 22–29, 32–38 and 57–59.

The M-SHORAD weapon system primarily consists of a mounted 360-degree air defense turret capable of using Stinger missiles, a 30-millimeter (mm) cannon, and a 7.62-mm machine gun. The M-SHORAD is designed to support maneuver forces with "shoot-on-the-move" capability requiring maneuvering across multiple TAs on existing roads and maneuver trails, setting up temporary firing positions during halts and continuing to various objectives. Although the Stinger missiles would not be fired at Fort Sill, appropriate simulations could be used in training.

Maneuver training would occur on existing trails and the M-SHORAD would use suitable infrastructure (roads and bridges) to access those trails. The Army uses a system of standards (military load class) to determine the amount of load that surfaces such as roads and bridges can safely handle. The M-SHORAD is a new system and the military load class for the vehicle is still being determined. The military load class would be determined for the M-SHORAD prior to use.

**ENVIRONMENTAL CONSEQUENCES OF THE ACTION:** Implementation of the proposed action has the potential for minor impacts to air quality, noise, biological resources, soil and geologic resources, water resources, land use, and safety (Table 1). These impacts would not be significant. No impacts to cultural resources are anticipated to result from implementation of the proposed action.

**Table 1. Summary Comparison of Environmental Consequences**

| Environmental Resources | Proposed Action | No Action |
|---|---|---|
| Air Quality | Minimal increases in criteria pollutants would occur from implementation of the proposed action. No significant impacts to air quality are anticipated. | No significant impacts to air quality would be expected. |
| Noise | Noise impacts would be temporary and intermittent, lasting only the duration of the training. No significant impacts to the noise environment are anticipated to result from implementation of training activities. | No significant noise impacts and noise levels would remain consistent with baseline conditions. |
| Biological Resources | Impacts to biological resources are anticipated to be minimal and not have long-term effects on population viability of biological resources. | No significant impacts to biological resources at Fort Sill or the areas surrounding Fort Sill would be expected. |
| Cultural Resources | No cultural resources would be affected from the implementation of the proposed action. | No significant impacts to cultural resources at Fort Sill or the areas surrounding Fort Sill would be expected. |
| Soil and Geologic Resources | Short-term, direct soil compaction and disturbances are anticipated from vehicles, foot traffic, and large equipment. Erosion impacts would be temporary and would be minimized through continued adherence to the ITAM program and by employing BMPs for soil erosion and sedimentation. Training activities would not result in significant soil impacts. | No significant impacts to soil and geologic resources at Fort Sill or the areas surrounding Fort Sill would be expected. |
| Water Resources | No construction is planned as part of the proposed action. Existing practices would continue to minimize impacts from training activities. | No significant impacts to water resources at Fort Sill or the areas surrounding Fort Sill would be expected. |

**Table 1. Summary Comparison of Environmental Consequences (Continued)**

| Environmental Resources | Proposed Action | No Action |
|---|---|---|
| Land Use | Proposed training is consistent and compatible with land use in the existing TAs. No significant impacts to land are anticipated to result from implementation of training activities. | No significant impacts to land use at Fort Sill or the areas surrounding Fort Sill would be expected. |
| Safety | No significant health and safety impacts are anticipated to result from the proposed action if all applicable Army Safety Program requirements are implemented. | No significant impacts to safety at Fort Sill would be expected. |
| Cumulative Impacts | Cumulative impacts resulting from implementation of the proposed action in conjunction with past, present, and reasonably foreseeable future actions at Fort Sill would not be significant. | No significant cumulative impacts would occur with implementation of the No Action Alternative. |

Key: BMPs = best management practices; ITAM = Integrated Training Area Management; TA = Training Area.

**PUBLIC OUTREACH:** As part of the planning process for this EA, Fort Sill mailed introductory project letters to local, state, and federal elected officials, Native American tribes, agencies, commissioners, and members of the public. On December 1, 2022, the SHPO responded and stated that they concur with the Fort Sill opinion that the undertaking would have no effect on historic properties. On November 29, 2022, the OAS responded and stated that they crosschecked the project location with the state files for archaeological sites and no sites are listed as occurring in the project area and an archaeological inspection is not required but encouraged Fort Sill to contact the OAS if archaeological materials are discovered. On December 19, 2022, the Comanche Nation sent a letter stating that the location of the project has been cross-referenced with the Comanche Nation site files where an indication of "No Properties" have been identified.

As part of the public outreach for this project, the Army published a public notice in the *Lawton Constitution* on Day, Month, Year and mailed postcards to those that received introductory letters, informing them of the availability of the EA and Draft FONSI. The public notice advertised to the public the availability of the EA and Draft FONSI at the Lawton Public Library in Lawton, Oklahoma, the Nye Library at Fort Sill, and via the Fort Sill website during the 30-day public review and comment period from Month Day, Year, through Month Day, Year.

**FINDING:** I conclude that, based upon the results of the Final EA, implementation of the M-SHORAD Bn Stationing Action at Fort Sill would not result in significant impacts per 40 CFR 1501.3(a)(2) and that an environmental impact statement is not required and will not be prepared. My decision is based on the analysis contained within the EA. This decision complies with legal requirements and has been made after taking into account all submitted information and considering a full range of reasonable alternatives and all environmental impacts.

_____ _____

Signature Date
Fort Sill Commanding General
U.S. Army

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# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| °F | degrees Fahrenheit |
| ACAM | Air Conformity Applicability Model |
| ADA | Air Defense Artillery |
| ADNL | A-weighted day-night level |
| AHPA | Archeological and Historic Preservation Act |
| AIRFA | American Indian Religious Freedom Act |
| APE | Area of Potential Effect |
| AR | Army Regulation |
| ARPA | Archaeological Resources Protection Act |
| BMP | best management practice |
| Bn | Battalion |
| C-UAS | Counter-Unmanned Aircraft Systems |
| CAA | Clean Air Act |
| CDNL | C-weighted day-night level |
| CEQ | Council on Environmental Quality |
| CFR | Code of Federal Regulations |
| $CH_4$ | methane |
| CO | carbon monoxide |
| $CO_2$ | carbon dioxide |
| $CO_2e$ | carbon dioxide equivalent |
| dB | decibels |
| DoD | U.S. Department of Defense |
| DoDI | DoD Instruction |
| DOI | Department of Interior |
| EA | Environmental Assessment |
| EIS | Environmental Impact Statement |
| EO | Executive Order |
| EQD | Environmental Quality Division |
| ESA | Endangered Species Act |
| FA | Field Artillery |
| FCoE | Fires Center of Excellence |
| FPPA | Farmland Protection Policy Act |
| FONSI | Finding of No Significant Impact |
| GHG | greenhouse gas |
| GOV | government-owned non-tactical vehicle |
| HAP | hazardous air pollutant |
| ICRMP | Integrated Cultural Resources Management Plan |
| ICUZ | Installation Compatible Use Zone |
| IDDS-A | Iron Dome Defense System-Army |
| IMCOM | Installation Management Command |
| INRMP | Integrated Natural Resources Management Plan |
| IPaC | Information for Planning and Consultation |
| ITAM | Integrated Training Area Management |
| JLTV | Joint Light Tactical Vehicle |
| M-SHORAD | Maneuver-Short Range Air Defense |

# ACRONYMS AND ABBREVIATIONS (Continued)

| | |
|---|---|
| MBTA | Migratory Bird Treaty Act |
| MEC | munitions and explosives of concern |
| mm | millimeter |
| NAAQS | National Ambient Air Quality Standards |
| NAGPRA | Native American Graves Protection and Repatriation Act |
| NEI | National Emissions Inventory |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| NOA | Notice of Availability |
| NOI | Notice of Intent(s) |
| NOx | nitrogen oxide |
| NRHP | National Register of Historic Places |
| $O_3$ | ozone |
| OAS | Oklahoma Archaeological Society |
| ODWC | Oklahoma Department of Wildlife Conservation |
| ONHI | Oklahoma Natural Heritage Inventory |
| PK $15_{(met)}$ | single event peak level exceeded by 15 percent of events |
| $PM_{2.5}$ | particulate matter less than or equal to 2.5 micrometers in diameter |
| $PM_{10}$ | particulate matter less than or equal to 10 micrometers in diameter |
| POV | privately owned vehicle |
| RTLP | Range and Training Land Program |
| ROI | region of influence |
| SDZ | Safety Danger Zone |
| SIP | State Implementation Plan |
| SHPO | State Historic Preservation Office |
| $SO_2$ | sulfur dioxide |
| $SO_x$ | sulfur oxides |
| SPCCP/ISCP | Spill Prevention, Control, and Countermeasures Plan and Installation Spill Contingency Plan |
| SWMP | Stormwater Management Plan |
| TA | Training Area |
| U.S. | United States |
| UAS | unmanned aircraft systems |
| *USC* | *United States Code* |
| USEPA | U.S. Environmental Protection Agency |
| USFWS | U.S. Fish and Wildlife Service |
| VOC | volatile organic compound |
| WMWR | Wichita Mountains National Wildlife Refuge |

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# 1. PURPOSE AND NEED FOR THE PROPOSED ACTION

## 1.1 INTRODUCTION

This Environmental Assessment (EA) analyzes and documents the environmental consequences that could result from stationing the Maneuver-Short Range Air Defense (M-SHORAD) Battalion (Bn) at Fort Sill, Oklahoma. The proposed action for stationing the M-SHORAD Bn at Fort Sill includes four primary elements: (1) the stationing of approximately 550 Soldiers and associated dependents to Fort Sill; (2) the stationing of M-SHORAD vehicles, equipment, and support infrastructure on Fort Sill; (3) the utilization of buildings and facilities on Fort Sill; and (4) M-SHORAD maneuver and training requirements for Fort Sill.

The United States (U.S.) Army is proposing to station the M-SHORAD Bn at Fort Sill. The primary purpose of the M-SHORAD Bn is to provide dedicated air defense and force protection while supporting divisional maneuver forces. The M-SHORAD system is designed to defend maneuvering forces against unmanned aircraft systems (UAS), and rotary-wing and fixed-wing threats.

The M-SHORAD system and associated battalion are assessed in the EA as a key component of air and missile defense modernization. Maneuvering formations require air defense capabilities to counter aerial threats. The Chief of Staff of the Army directed an effort to improve the Air Defense Artillery (ADA) capability to protect the maneuver force and station an M-SHORAD Bn at Fort Sill. Fort Sill is home to the Fires Center of Excellence (FCoE) which is dedicated to the training, education, and development of Soldiers and Leaders; creates and develops capabilities; and provides a Fires Force to support the Joint Warfighting Commander across the spectrum of operations in Joint and Multinational Environments. While the M-SHORAD Bn (or 4-60$^{th}$) would operate as a tenant unit under FCOE, supporting the overall Army mission, they are a detachment unit headquartered under the 1$^{st}$ Armored Division, located at Fort Bliss, Texas.

### *1.1.1 Background*

Fort Sill is in Comanche County, Oklahoma, approximately 90 miles southwest of Oklahoma City, Oklahoma, and approximately 50 miles north of Wichita Falls, Texas, on Interstate 44 (Figure 1-1). The cities of Lawton and Cache border Fort Sill to the south and Elgin and Medicine Park are located to the north. The Wichita Mountains National Wildlife Refuge (WMWR) is located along the northwestern border of Fort Sill.

Fort Sill extends approximately 27 miles in an east-west direction and approximately 4 to 9 miles in a north-south direction, depending on the 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.

The FCoE is an organization that combines the U.S. Army Field Artillery (FA) Center and School and the U.S. Army ADA Center and School. Principal operational units at Fort Sill include the 75th, 428th, and 434th FA Brigades, and the 30th and 31st ADA Brigades. 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.

The mission of Fort Sill is to train, educate, and develop Soldiers and leaders; create and develop capabilities; engage, collaborate, and partner with stakeholders; and provide a fires force to support joint warfighting commanders across the spectrum of operations in the Joint and Multinational environment (Fort Sill 2020).

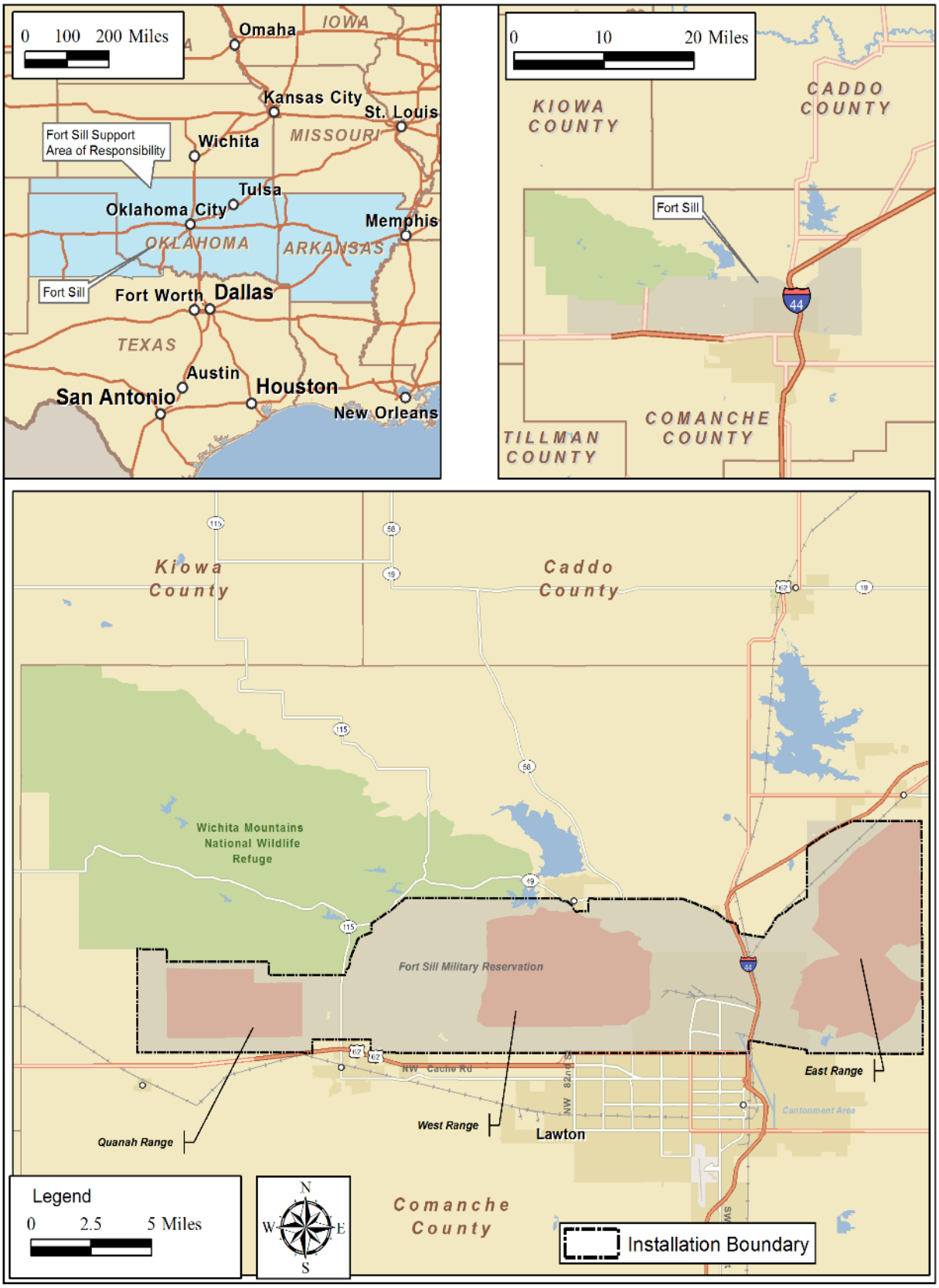


**Figure 1-1. Regional Maps of Fort Sill**

## 1.2 PURPOSE OF THE PROPOSED ACTION

The purpose of the proposed action is to improve the protection of tactical maneuver forces from current and future aerial threats. The Army has been building a future force structure that is shaped by new and emerging threats, technological advances, and a prevalence of joint operations. Building the future Army involves a modernization plan that relies on a capabilities-based assessment and integrated capabilities doctrine. The M-SHORAD capability is part of the implementation of an Air and Missile Defense modernization strategy that incorporates improvements in systems across the air defense portfolio. M-SHORAD systems will employ a variety of sensors and weapon systems (missiles and machine guns) to protect forward-operating maneuver forces. The M-SHORAD capability will provide maneuver forces the ability to detect and engage aerial threats before they can pose a threat to maneuver forces. The M-SHORAD is a versatile system that conducts dedicated air defense operations, organized as battalions, and assigned to a division.

## 1.3 NEED FOR THE PROPOSED ACTION

Implementation of the proposed action is needed to improve the Army's dedicated air defense capability in current maneuver formations to counter short-range aerial threats. Stationing the M-SHORAD Bn at Fort Sill is necessary to establish the capabilities to provide air defense and force protection to support divisional maneuver forces in a division that it will be aligned with. The M-SHORAD Bn would simultaneously operate with current air defense systems and communication architecture on the Stryker vehicle platform.

## 1.4 SCOPE OF THE ENVIRONMENTAL ANALYSIS

This EA has been developed in accordance with the National Environmental Policy Act (NEPA) (40 *Code of Federal Regulations [CFR]* §§ 1500-1508 and 32 *CFR* 651, et seq.) and implementing regulations issued by the President's Council on Environmental Quality (CEQ) *Regulations for Implementing the Procedural Provisions of NEPA* (43 *Federal Register* 55990).

On May 20, 2022, CEQ issued a final rule, *National Environmental Policy Act Implementing Regulations* (Final Rule, 87 *Federal Register* 23453). CEQ issued this final rule to amend certain provisions of its regulations for implementing NEPA, addressing the purpose and need of a proposed action, agency NEPA procedures for implementing CEQ's NEPA regulations, and the definition of "effects." The amendments generally restore provisions that were in effect for decades before being modified in 2020. Therefore, this EA has been prepared in accordance with the new regulations.

The EA will inform Army decision makers, agencies, Native American tribes, the public, and others of the potential human and natural environmental consequences that could result from stationing the M-SHORAD Bn at Fort Sill.

An interdisciplinary team of environmental scientists, biologists, planners, economists, engineers, archaeologists, and military technicians has analyzed the proposed action relative to existing conditions and identified the potential impacts associated with implementation of the proposed action. The proposed action and the No Action Alternative are described in Chapter 2. Conditions existing as of 2022, considered to be the "baseline" conditions, are described in Chapter 3, Affected Environment. The potential impacts of the proposed action, also described in Chapter 3, are presented immediately following the description of baseline conditions for each resource area addressed in this EA. Chapter 3 also addresses the potential for reasonably foreseeable impacts and identifies mitigation measures that can be implemented where appropriate.

## 1.5 PUBLIC INVOLVEMENT AND AGENCY AND TRIBAL COORDINATION

Executive Order (EO) 12372, *Intergovernmental Review of Federal Programs*, requires intergovernmental notifications prior to making any detailed statement of environmental consequences. Fort Sill is the proponent for this action. Through the process of interagency coordination, the proponent must notify interested federal, state, and local agencies and allow them sufficient time to evaluate potential environmental consequences of a proposed action. Comments from these agencies are subsequently incorporated into the environmental analysis. Consultation with Native American tribal governments was conducted in accordance with 36 *CFR* 800. Public participation opportunities with respect to this EA and decision making on the proposed action are guided by 32 *CFR* 651 (see Appendix A).

The Army encouraged and invited public/agency, tribal, and other participation in the NEPA process. Consideration of the views and information of all interested persons promotes open communication and enables better decision making. As part of the planning process for this EA, Fort Sill mailed introductory project letters to local, state, and federal elected officials, Native American tribes, agencies, commissioners, and members of the public. Fort Sill received responses from the Comanche Nation, the Oklahoma State Historic Preservation Officer (SHPO) and the Oklahoma Archaeological Survey (OAS). Representative project letters and responses received are contained in Appendix A.

The EA and draft Finding of No Significant Impact (FONSI) were made available for review on the Fort Sill website, at the Lawton Public Library, located at 110 SW 4th St., Lawton, OK, 73501, and at the Nye Library, located at 1640 Randolph Road, Fort Sill, OK, 73503, from February 4, 2023 through March 6, 2023. In advance of the public review and comment period, Fort Sill mailed postcards to those that received the introductory letter, informing them of the availability of the EA and draft FONSI. The Notice of Availability (NOA) for the EA and draft FONSI was published in the *Lawton Constitution* on February 4, 2023. All agencies, organizations, tribes, and members of the public with a potential interest in the proposed action were encouraged to participate in the decision-making process during the 30-day EA and draft FONSI public review and comment period.

## 1.6 DECISIONS TO BE MADE

This NEPA process will end with an Army decision documented in a FONSI or a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS). Prior to making a final decision, the Garrison Commander will consider both the environmental and socioeconomic impacts analyzed in this EA, along with all other relevant information, such as public issues of concern identified during the comment period. If the Garrison Commander determines that there are no significant environmental impacts, that decision will be documented in the final FONSI, which will be signed no earlier than 30 days from the publication of the NOA for this EA and the draft FONSI. The Army may initiate a NOI for an EIS if new information warrants the need for additional analysis of potentially significant environmental impacts.

## 1.7 RESOURCE AREAS NOT CARRIED FORWARD FOR DETAILED ANALYSIS

The determination of resource areas to be analyzed versus those not carried forward for detailed analysis is part of the EA scoping process. CEQ and Army Regulations (ARs) (40 *CFR* 1501.9(f)(1) and 32 *CFR* 651.5(d)(5)) encourage project proponents to identify and eliminate issues from detailed study that are not significant or have been covered by prior environmental reviews.

**Airspace** – M-SHORAD training activities within Fort Sill airspace would be consistent with current uses and impacts.

**Aesthetics and Visual Resources** – No changes to the aesthetics and visual resources of Fort Sill or surrounding areas would occur with implementation of the proposed action; thus, further analysis of aesthetics and visual resources was determined unnecessary.

**Surface Transportation –** The pattern of traffic flow would not be expected to significantly change, as the proposed action includes only a small addition (approximately 570 Soldiers and contractors plus 760 dependents) to Fort Sill's population. This addition of personnel would be a 2.5 percent increase to the existing population of about 53,000 personnel and dependents (Military OneSource 2022) at Fort Sill. Further analysis of transportation systems was determined unnecessary.

**Hazardous Materials and Waste –** The increase in hazardous materials and hazardous and solid waste resulting from fielding an M-SHORAD Bn at Fort Sill would not be appreciable. All these materials are managed under strict requirements of federal, state, Army, and installation regulations. Proper transport, storage, use, and disposal are mandated within the regulations. Also, construction-related debris associated with facility construction or improvements would be non-substantial and re-used or recycled per applicable best management practices (BMPs) or disposed of per applicable regulations in approved landfills.

**Utilities –**There are no utility improvements planned as part of this action. The small number of personnel associated with the proposed action would not significantly impact the demand for any existing utilities. Therefore, further analysis of utilities was determined unnecessary.

**Socioeconomics, Environmental Justice, and Protection of Children –** The proposed action would result in only minimal economic benefits from a minimal increase in spending associated with the minor increase in personnel. Therefore, further analysis of socioeconomics was determined unnecessary. As there is no potential for significant adverse impacts to areas outside the boundary of Fort Sill, no communities would be adversely impacted and there is no potential for disproportionate impacts to minorities or children.

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# 2. DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This chapter describes how implementation of the proposed action and No Action alternatives at Fort Sill would meet the underlying purpose and need described in Chapter 1. The No Action Alternative (i.e., the M-SHORAD Bn would not be stationed at Fort Sill) is fully evaluated and described as the status quo in Section 2.2. Under the No Action Alternative, Fort Sill would continue to serve as home of the FCoE and continue to train Soldiers and develop FA and ADA leaders, design and develop fire support for the force, support unit training and readiness, mobilize and deploy operating forces, and maintain installation infrastructure and services.

Implementation of the proposed action would be subject to any mitigation or maintenance measures described in the Draft FONSI. Before implementing the proposed action, the Environmental Quality Division (EQD) at Fort Sill would evaluate any alterations or changes to the actions being proposed or changes to how those actions would be implemented to determine if additional NEPA analysis would be required.

## 2.1 DESCRIPTION OF PROPOSED ACTION

The proposed action includes four primary elements: (1) the stationing of approximately 550 Soldiers and associated dependents to Fort Sill, (2) the stationing of M-SHORAD vehicles, equipment, and support infrastructure on Fort Sill, (3) the utilization of buildings and facilities on Fort Sill, and (4) M-SHORAD Bn maneuver and training requirements for Fort Sill.

### *2.1.1 M-SHORAD Personnel Requirements*

Stationing the M-SHORAD Bn at Fort Sill would require sufficient personnel to operate and maintain the M-SHORAD system. Stationing the M-SHORAD Bn at Fort Sill would result in an increase of approximately 550 Soldiers. An additional 20 contractor support personnel are anticipated to support the M-SHORAD system. In addition to the personnel required to support the M-SHORAD Bn, the dependents or family members of non-contractor active-duty Soldiers are also included in this analysis. Using a dependent per Soldier factor of 1.38 (U.S. Department of Defense [DoD] 2018) for the regular Army, approximately 760 dependents would accompany the active-duty Soldiers to the Fort Sill area.

### *2.1.2 M-SHORAD Vehicles and Equipment*

Stationing the M-SHORAD Bn would require a variety of different vehicles and equipment to be located at Fort Sill. The M-SHORAD system integrates existing guns, missiles, and sensors onto a Stryker A1 combat vehicle. Up to 40 Stryker A1 combat vehicles equipped as M-SHORAD systems would be stationed at Fort Sill as part of this action. In support of the 40 M-SHORAD system vehicles, an additional 20 Stryker A1 combat vehicles equipped as Infantry Carrier Vehicles for platoon leaders and Medical Evacuation vehicles would also be stationed at Fort Sill. The MaxxPro Mine Resistant Ambush Protected vehicle could be substituted for some or all the additional 20 Stryker A1 combat vehicles. The battalion would also include approximately 100 Joint Light Tactical Vehicles (JLTVs) and approximately 150 support vehicles such as pickup trucks, other vehicles and trailers. The M-SHORAD Bn could also include the High-Mobility Multipurpose Wheeled Vehicles instead of the JLTVs, depending on procurement timelines and priorities (U.S. Army 2021). A variety of individual weapons, sensors, communications equipment, and support and maintenance equipment would also be included with the stationing.

Section 1.3 and Table 1.3-1 of the M-SHORAD Programmatic EA (U.S. Army 2021) include additional details on the equipment required for stationing of the M-SHORAD Bn.

### 2.1.3 M-SHORAD Buildings and Facilities

Implementation of the M-SHORAD Bn stationing at Fort Sill would require administration buildings for headquarters facilities and offices, buildings for vehicle maintenance equipment and material storage, secure parking areas for vehicles and equipment, and buildings for barracks. For the purposes of analysis in this EA, the M-SHORAD Bn stationing at Fort Sill would utilize existing facilities and not require the construction of any new buildings. It is possible that additional facility modifications would occur in the future. The detailed requirements for these facilities are not known at this time. Once these requirements are known, additional NEPA analysis would be required. Table 2-1 identifies the facility requirements for the M-SHORAD Bn and identifies facilities at Fort Sill that would accommodate those requirements.

**Table 2-1. Facility Requirements M-SHORAD**

| Requirement | Category Code | Fort Sill Facility |
|---|---|---|
| Battalion HQ Facility | 14185 | Building 3415 |
| Maintenance Company HQ | 14185 | Building 3203 |
| Four Battery HQs | 14185 | Building 3203 |
| Hazardous Material Storage Facility | 21470 | Building 2454 |
| Barracks (approximately 182 unaccompanied personnel[1]) | 72111 | Buildings 3427, 3428, 3429 |
| Tactical Equipment Maintenance Facility | 21410 | Building 2454 |

Key: HQ = Headquarters; M-SHORAD = Maneuver-Short Range Air Defense.
[a] U.S. Army 2021

Long-term plans (greater than five years) could include the construction of additional facilities on Fort Sill. If additional facilities are identified to be needed in the future, those would be evaluated under a separate NEPA analysis at that time.

### 2.1.4 M-SHORAD Maneuver and Training

Implementation of the M-SHORAD Bn stationing action would also involve maneuver training and the use of various ranges on Fort Sill. The M-SHORAD Bn maneuver and training requirements can be met in existing Training Areas (TAs) on Fort Sill. Because the M-SHORAD vehicle is characterized as a heavy vehicle, "Maneuver Area Heavy" TAs would be utilized to support maneuver training on Fort Sill. These could include the following TAs: TAs 1–10, with limited use in 4 and 7 because of their locations, and TAs 11, 15, 16, 18, 19, 20, 22–29, 32–38, and 57–59 (Figure 2-1).

The M-SHORAD weapon system primarily consists of a mounted 360-degree air defense turret capable of using Stinger missiles, a 30-millimeter (mm) cannon, and a 7.62-mm machine gun (U.S. Army 2021). The M-SHORAD is designed to support maneuver forces with "shoot-on-the-move" capability requiring maneuvering across multiple TAs on existing roads and maneuver trails, setting up temporary firing positions during halts and continuing to various objectives.

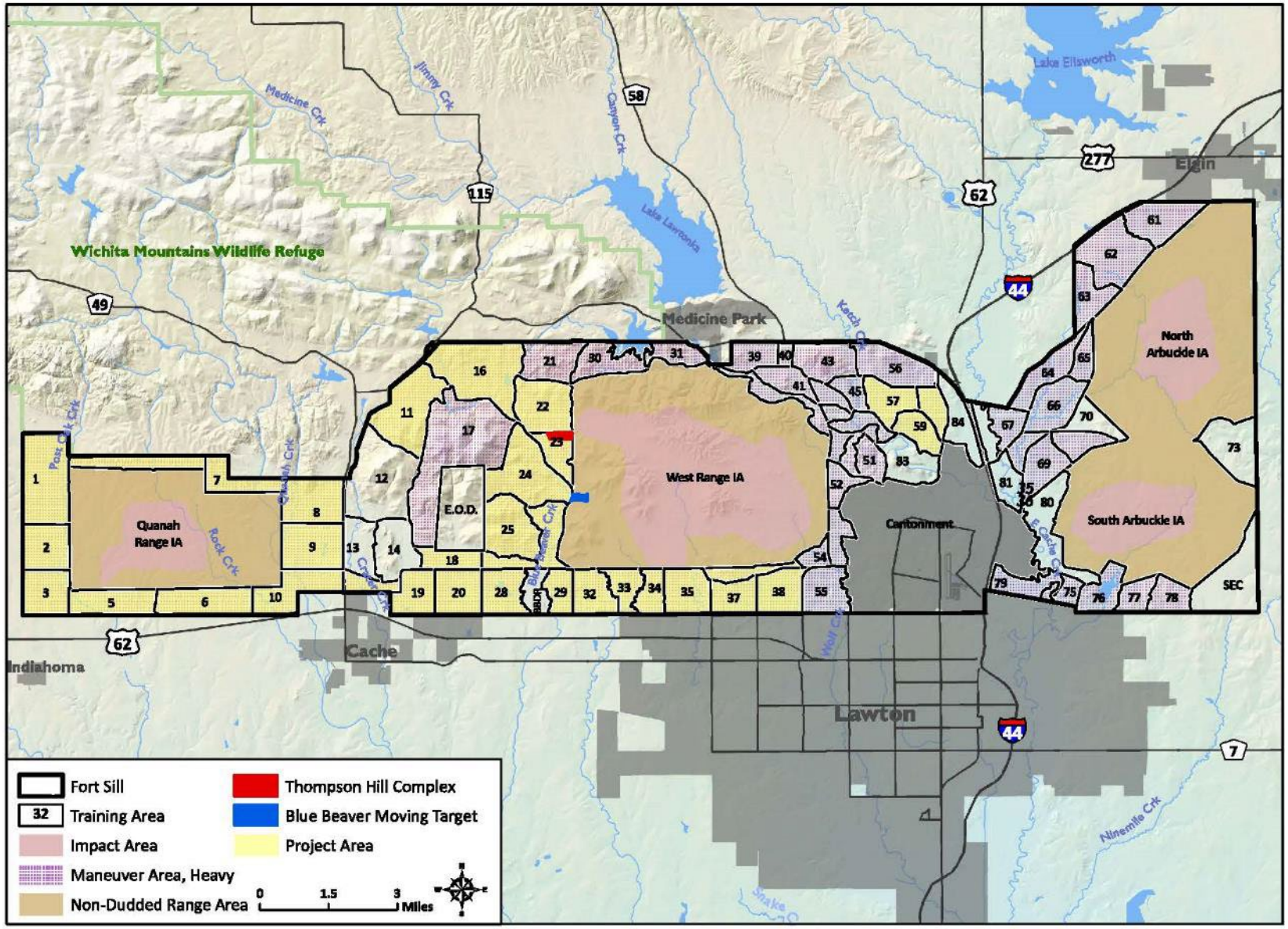



**Figure 2-1. Heavy Maneuver Training Areas and Ranges Proposed for Use on Fort Sill**

Maneuver training would occur on existing trails and the M-SHORAD would use suitable infrastructure (roads and bridges) to access those trails. The Army uses a system of standards (military load class) to determine the amount of load that surfaces such as roads and bridges can safely handle. The M-SHORAD is a new system and the military load class for the vehicle would be determined prior to use at Fort Sill. Once the class is determined that rating would be compared with the known limits of roads and bridges on Fort Sill and appropriate routes to TAs would be determined to avoid use of any infrastructure unsuitable to the load class of the vehicle.

Live-fire training using the Stinger would be completed at locations other than Fort Sill. Stinger training at Fort Sill could be accomplished through appropriate simulations. Various ranges on Fort Sill could be used to train with the 7.62-mm machine gun and 30-mm cannon. The 30-mm cannon would use the M788 Target Practice round. Approximately 64,600 rounds of 7.62-mm ammunition and 43,200 rounds of 30-mm ammunition would be used annually. Safety Danger Zones (SDZs) for the 7.62- and 30-mm ammunition were evaluated and approved by the Fort Sill Range Manager and all SDZs can be accommodated in the existing impact area, (see Appendix B for illustrations of all the SDZs).

Training related to the air defense mission of the M-SHORAD would involve targeting UAS. The DoD defines UAS into a number of groups. UAS groups that would be used at Fort Sill related to the M-SHORAD include Groups 1, 2, and 3. Group 1 UAS are typically hand launched and operate within visual range. These UAS are similar to radio-controlled airplanes. Group 2 are small to medium sized UAS that operate from unimproved areas and may have a launch assist system. Group 3 includes UAS that operate at medium to long range and may or may not require a runway for launch (DoD 2011).

UAS would launch from the Thompson Hill Complex (Figure 2-1) or Landing Strip 15 and the M-SHORAD vehicles would be located at the Thompson Hill Complex. Landing and recovery of UAS is currently occurring at Landing Strip 15 and M-SHORAD activities are anticipated to be similar in type and duration to existing activities. Activities at Landing Strip 15 would involve the launch and recovery of Group 2 or 3 UAS and other M-SHORAD training activities would not occur at that location. Training scenarios would be planned to result in UAS targets landing/crashing outside of the dudded impact area to facilitate in UAS recovery. It is anticipated that some UAS could land in the dudded impact area and would not be recoverable. Procedures for UAS recovery could include:

- The UAS and any associated debris would be bagged and delivered to EQD for proper disposal.
- UAS wreckage inside the dudded impact area would be coordinated with Explosive Ordnance Disposal regarding cleanup. Specialized recovery equipment may be used if available. Otherwise, the Range Rule (40 *CFR* S 266 Subpart M) would cover the wreckage being left in place. Operational ranges have a monitoring program that includes the sampling of runoff, sediment, and groundwater.
- It is estimated that approximately 240 UAS would land/crash in the impact area each year, with most falling outside of the dudded impact area.

## 2.2 NO ACTION ALTERNATIVE

Implementation of the No Action Alternative would mean that the M-SHORAD system and associated Bn, including vehicles and manpower, would not be stationed at Fort Sill. The facilities planned to be used for the M-SHORAD Bn would continue in their current use. Although

implementation of the No Action Alternative would not meet the purpose and need, the No Action Alternative serves as the baseline for the comparison of potential impacts to all resource areas. Under the No Action Alternative, the Army would not move forward with a key component of air and missile defense modernization at Fort Sill. Fort Sill would not be a part of the Chief of Staff of the Army directed effort to improve the ADA capabilities to protect the maneuver force and station the M-SHORAD Bn at Fort Sill.

## 2.3 SUMMARY COMPARISON OF ENVIRONMENTAL CONSEQUENCES

Table 2-2 summarizes the potential environmental consequences from Chapter 3 where the project description from Chapter 2 is overlaid on the baseline conditions from Chapter 3. The consequences are presented for each resource area and are described for all alternatives, including the No Action Alternative.

**Table 2-2. Summary Comparison of Environmental Consequences by Environmental Resource**

| Environmental Resources | Proposed Action | No Action |
|---|---|---|
| Air Quality | Minimal increases in criteria pollutants would occur from implementation of the proposed action. No significant impacts to air quality are anticipated. | No significant impacts to air quality would be expected. |
| Noise | Noise impacts would be temporary and intermittent, lasting only the duration of the training. No significant impacts to the noise environment are anticipated to result from implementation of training activities. | No significant noise impacts and noise levels would remain consistent with baseline conditions. |
| Biological Resources | Impacts to biological resources are anticipated to be minimal and not have long-term effects on population viability of biological resources. | No significant impacts to biological resources at Fort Sill or the areas surrounding Fort Sill would be expected. |
| Cultural Resources | No cultural resources would be affected from the implementation of the proposed action. | No significant impacts to cultural resources at Fort Sill or the areas surrounding Fort Sill would be expected. |
| Soil and Geologic Resources | Short-term, direct soil compaction and disturbances are anticipated from vehicles, foot traffic, and large equipment. Erosion impacts would be temporary and would be minimized through continued adherence to the ITAM program and by employing BMPs for soil erosion and sedimentation. Implementation of the training activities would not result in significant soil impacts. | No significant impacts to soil and geologic resources at Fort Sill or the areas surrounding Fort Sill would be expected. |
| Water Resources | No construction is planned as part of the proposed action. Existing practices would continue to minimize impacts from training activities. | No significant impacts to water resources at Fort Sill or the areas surrounding Fort Sill would be expected. |
| Land Use | Proposed training is consistent and compatible with land use in the existing TAs. No significant impacts to land are anticipated to result from implementation of training activities. | No significant impacts to land use at Fort Sill or the areas surrounding Fort Sill would be expected. |
| Safety | No significant health and safety impacts are anticipated to result from the proposed action if all applicable Army Safety Program requirements are implemented. | No significant impacts to safety at Fort Sill would be expected. |

**Table 2-2. Summary Comparison of Environmental Consequences by Environmental Resource (Continued)**

| Environmental Resources | Proposed Action | No Action |
|---|---|---|
| Cumulative Impacts | Cumulative impacts resulting from implementation of the proposed action in conjunction with past, present, and reasonably foreseeable future actions at Fort Sill would not be significant. | No significant cumulative impacts would occur with implementation of the No Action Alternative. |

Key: BMPs = best management practices; ITAM = Integrated Training Area Management; TA = Training Area.

# 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

## 3.1 AIR QUALITY

### *3.1.1 Resource Definition and Methodology*

Air quality is determined by the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. The levels of pollutants are generally expressed on a concentration basis in units of parts per million or micrograms per cubic meter.

The current standards for pollutant concentrations are the National Ambient Air Quality Standards (NAAQS) established under the Clean Air Act (CAA). These standards represent the maximum allowable atmospheric concentrations that may occur and still protect public health and welfare. The NAAQS provide both short-term and long-term standards for the following criteria pollutants: carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter equal to or less than 10 and 2.5 micrometers, ozone ($O_3$), and lead. The Oklahoma Department of Environmental Quality has adopted the NAAQS for purposes of regulating criteria pollutant levels within Oklahoma.

Under the CAA it is the responsibility of the individual states to achieve and maintain the NAAQS. To accomplish this, states develop a State Implementation Plan (SIP) that is approved by the U.S. Environmental Protection Agency (USEPA). A SIP identifies goals, strategies, schedules, and enforcement actions designed to reduce the level of pollutants in the air and bring the state into compliance with the NAAQS.

All areas of the United States are designated as having air quality better than the NAAQS (attainment) or worse than the NAAQS (nonattainment). Areas where there are insufficient air quality data for the USEPA to form a basis for attainment status are unclassifiable. Thus, such areas are treated as attainment areas until proven otherwise. “Maintenance areas” are those that were previously classified as nonattainment but where air pollution concentrations have been successfully reduced to levels below the standard. Maintenance areas are subject to special maintenance plans to ensure compliance with the NAAQS.

Hazardous air pollutants (HAPs) are chemicals that are known or suspected of causing cancer or other serious health effects. Unlike the criteria pollutants, HAPs currently do not have national ambient standards. Some volatile organic compounds (VOCs) are classified as HAPs. VOCs are also $O_3$ precursors and include any organic compound involved in atmospheric photochemical reactions, except those designated by a USEPA administrator as having negligible photochemical reactivity. HAPs are not covered by the NAAQS but may present a threat of adverse human health or environmental effects under certain conditions.

Potential impacts to 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. Therefore, in order to evaluate air emissions and their impact on the overall region of influence (ROI), the emissions associated with the project activities were compared with the total emissions on a pollutant-by-pollutant basis for the ROI’s 2017 National Emissions Inventory (NEI) data.

The Air Conformity Applicability Model (ACAM) Version 5.0.17b was utilized to provide a level of consistency with respect to emissions factors and calculations for emissions resulting from use

of privately owned vehicles (POVs) and government-owned non-tactical vehicles (GOVs). The ACAM provides estimated air emissions from proposed federal actions in areas designated as attainment, nonattainment and/or maintenance for each specific criteria and precursor pollutant as defined in the NAAQS. ACAM was utilized to calculate emissions resulting from the use of POVs and GOVs in the ROI. The ACAM Report can be found in Appendix C.

Emission factors from the "Air Emissions Guide for Air Force Mobile Sources" (U.S. Air Force 2021) were used to provide the estimated air emissions from training activities (tactical vehicles) on the existing TAs and ranges within the confines of the Fort Sill portion of the ROI. The Excel spread sheet with the formulas and resulting emissions can be found in Appendix C.

The impacts of greenhouse gases (GHGs) are limited to potentially minor effects on carbon dioxide, nitrous oxide and methane emissions. They are not calculated or reported here. The *Final Rule: Mandatory Reporting of Greenhouse Gases* (74 *Federal Register 56260*) requires reporting from engine and vehicle manufacturers, not fleet operators. In addition, U.S. Army tactical vehicles are not certified under or subject to 40 CFR Parts 89, 1039, or 1065 as required for reporting by 74 *Federal Register 56260*.

### *3.1.2 Affected Environment*

Fort Sill Oklahoma is located in Comanche County, Oklahoma, which constitutes the ROI for air quality. This area is analyzed for the regional air quality impact.

#### 3.1.2.1 Climate

Comanche County is located in the mid-lower southwest portion of Oklahoma, 85 miles southwest of Oklahoma City. The climate of the area is classified as humid subtropical in accordance with the Wladimir Koppen climate characterizations. The historic climatological data, based on 30 years of records indicates that the warmest month is July with an average temperature of 96.2 degrees Fahrenheit (°F), and the coolest month on average is January, with an average temperature of 27.1°F. The highest recorded temperature since records have been kept is 115°F, which occurred during the month of August. The lowest recorded temperature was negative 11°F, which was recorded during the month of January.

The average annual amount of precipitation for the ROI is 30.9 inches. There is an average of 64 days of rain per year. The month with the most precipitation, on average, is May, with 5 inches of precipitation. The month with the least precipitation, on average, is January, with an average of 1.2 inches (liquid water equivalent). The annual average snowfall is 3.9 inches. The month with the highest average snowfall is in January with 1.4 inches (Weatherbase 2022).

#### 3.1.2.2 Air Quality

According to the USEPA, Comanche County is in attainment for all criteria pollutants and has no maintenance area for any criteria air pollutant (USEPA 2022a); therefore, the proposed action is exempt from the requirements of the General Conformity Regulation. Emissions that would be generated were compared with Comanche County emissions obtained from USEPA's 2017 NEI. NEI data are the latest available; these are presented in Table 3-1. The county data includes emission amounts from point sources, area sources, and mobile sources. *Point sources* are stationary sources that can be identified by name and location. *Area sources* are point sources from which emissions are too low to track individually, such as a home or small office building, or a diffuse stationary source, such as wildfires or agricultural tilling. *Mobile sources* are any kind of vehicle or equipment with gasoline or diesel engine, an airplane, or a ship. Two types of mobile sources are considered: on-road and nonroad. On-road sources consist of vehicles such as cars,

light trucks, heavy trucks, buses, engines, and motorcycles. Nonroad sources include aircraft, locomotives, boats and ships, personal watercraft, lawn and garden equipment, agricultural and construction equipment, and recreational vehicles.

**Table 3-1. Combined Current Criteria Pollutant Emissions Inventory for the ROI**

| County | Criteria Pollutants (tons/year) | | | | | |
|---|---|---|---|---|---|---|
| | CO | $NO_X$ | $PM_{10}$ | $PM_{2.5}$ | $SO_X$ | VOCs |
| Comanche | 19,595 | 2,281 | 10,398 | 1,990 | 89 | 7,521 |

Key: CO = carbon monoxide; $NO_X$ = nitrogen oxides; $PM_{10}$ and $PM_{2.5}$ = particulate matter with a diameter of less than or equal to 10 microns and 2.5 microns, respectively; $SO_X$ = sulfur oxides; VOC = volatile organic compound.
Source: (USEPA 2022b)

#### 3.1.2.3 Greenhouse Gas Emissions

GHGs are gases that trap heat in the atmosphere; the accumulation of these gases in the atmosphere has been attributed to the regulation of the Earth's temperature. Human influence on the climate system is clear and recent anthropogenic emissions of GHGs are the highest in history. Recent climate changes have had widespread impacts on human and natural systems (IPCC 2014). Accordingly, GHG emissions have been assessed. The data is provided here for the information of Army decision makers as well as members of the public.

The GHGs of interest for this project include carbon dioxide, nitrous oxide, and methane, they are reported as carbon dioxide equivalents. GHG emissions for the ROI, obtained from USEPA's 2017 NEI, are summarized in Table 3-2.

**Table 3-2. Combined Current Greenhouse Gas Emissions Inventory for the ROI**

| County | Greenhouse Gases (tons/year) | | | |
|---|---|---|---|---|
| | $CO_2$ | $NO_X$ | $CH_4$ | $CO_2e$ |
| Comanche | 953,164 | 15 | 4,131 | 1,060,909 |

Key: $CH_4$ = methane; $CO_2$ = carbon dioxide; $CO_2e$ = carbon dioxide equivalent; NOx = nitrogen oxides.
Source: USEPA 2022b

### *3.1.3 Environmental Consequences*

#### 3.1.3.1 No Action Alternative

Under the No Action Alternative, there would be no new activities associated with M-SHORAD training and operations. The No Action Alternative would not result in significant impacts to air quality at Fort Sill.

#### 3.1.3.2 Proposed Action

No construction is planned as part of the proposed action. Emissions were evaluated for training activities using the methodology described in Section 3.1.1. Total emissions within the ROI are shown in Table 3-3 and range from 0.01 percent to 0.08 percent of emissions for the various pollutants in the ROI.

Air quality impacts and emissions resulting from implementation of the proposed action would be minor, and not considered significant.

**Table 3-3. Proposed Action Air Emissions Compared with ROI Emissions**

| Activity Phase | Annual Emissions (tons/year) | | | | | |
|---|---|---|---|---|---|---|
| | CO | $NO_X$ | $PM_{10}$ | $PM_{2.5}$ | $SO_X$ | VOCs |
| POV/GOV Use | 15.07 | 1.14 | 0.03 | 0.02 | 0.01 | 1.28 |
| ROI | 19,595 | 2,281 | 10,398 | 1,990 | 89 | 7,571 |
| Percentage of ROI | 0.08% | 0.05% | 0.00% | 0.00% | 0.01% | 0.02% |

## 3.2 NOISE

### *3.2.1 Resource Definition and Methodology*

Noise is considered unwanted sound that interferes with normal activities or otherwise diminishes the quality of the environment. Sound levels in this document are stated in decibels (dB), a logarithmic scale used to simplify communication of a very wide range of audible sound pressure levels. At distances of about 3 feet, normal human speech ranges from 63 to 65 dB, loud kitchen appliances (e.g., blender) range from about 83 to 88 dB, and rock bands can approach 110 dB. Because dB are logarithmic values, they do not sum like whole numbers. Combining two noise sources with the same dB noise level will increase the overall noise level by 3 dB. In cases in which one noise source is much louder than another added noise source, the louder noise source dominates the noise environment, and the other source plays a minor role in determining overall noise level. To state this observation in mathematical terms, the addition of a noise that is 10 dB less than another noise will have no noticeable affect (approximately 0.1 dB increase) on the overall noise level.

The frequency (i.e., pitch) of a sound is also important in determining how the sound will be perceived. Unless otherwise noted, noise levels in this document have been adjusted to emphasize frequencies heard best by the human ear, a process known as "A-weighting" and represented in dBA.

Firing of large-arm munitions generates sounds that are felt as well as heard. With this type of noise, energy in frequency bands not heard well by the human ear could have substantial impacts. Large-arm munition noise levels are often C-weighted, an adjustment that de-emphasizes extremely low- and high-frequency sounds to a lesser extent than A-weighting. Small- and large-arm single firing event noise levels are sometimes described using peak sound levels that are "flat-weighted" (i.e., no adjustment for frequency sensitivity). Because C-weighted and flat-weighted dB values quantify noise differently, dB values with different weighting types cannot be summed.

The DoD's environmental planning program promotes the development and implementation of noise programs on military installations. The noise programs strive to guide compatibility between the activities and operations of the installation and neighboring civilian communities. Chapter 14 of AR 200-1, *Environmental Protection and Enhancement,* outlines the noise management policy for the Army. This policy includes:

- Evaluation and documentation of noise impacts resulting from ongoing and proposed actions/activities and minimization of annoyance to humans to the extent practicable.
- Development of an Installation Compatible Use Zone (ICUZ) study. The ICUZ Study is the tool used by the Army and local planning committees to facilitate compatible development.

AR 200-1 identifies housing, schools, and medical facilities as examples of noise-sensitive land uses. AR 200-1 offers land use recommendations (four zones) that facilitate future development to mitigate the potential relationship between noise resulting from Army training activities and citizen concerns. Table 14-1 of AR 200-1 classifies noise levels resulting from various Army activities into four different zones (Table 3-4). The four zones are:

- **Land Use Planning Zone (LUPZ):** Zone used to better predict noise impacts associated with increased levels of operations at airfields or with large-caliber weapon ranges. This zone is used to provide communities with additional information regarding land use decisions.
- **Zone 1:** Typically compatible with most noise-sensitive (housing, schools, medical facilities) land uses.
- **Zone 2:** Normally incompatible with most noise-sensitive land uses. Exposure to noise in this zone could be considered significant. Without additional mitigation, land uses are normally limited to less sensitive (e.g., industrial) activities.
- **Zone 3:** Incompatible with noise-sensitive land uses. Exposure to noise in this zone is generally considered severe, thus noise-sensitive land uses should not be considered in this zone.

**Table 3-4. Land Use Guidelines Noise Limits**

| Noise Zone | Aviation ADNL (dB) | Impulsive CDNL (dB) | Small Arms (PK $15_{(met)}$) |
|---|---|---|---|
| LUPZ | 60-65 | 57-62 | N/A |
| Zone I | <65 | <62 | <87 |
| Zone II | 65-75 | 62-70 | 87-104 |
| Zone III | >75 | >70 | >104 |

Key: < = less than; > = greater than; ADNL = A-weighted day-night-level; CDNL = C-weighted day-night level; LUPZ = Land Use Planning Zone; N/A = not applicable; PK $15_{(met)}$ = single event peak level exceeded by 15 percent of events.

While the noise contours for large-caliber weapons extend off the installation boundary, the majority of noise associated with small-arms fire only impacts areas within the installation boundary.

For this analysis, noise impacts are considered in terms of context and intensity. "Context" includes the current noise environment, as described in Section 3.2.2. "Intensity" is described in terms of instantaneous noise levels and the duration of the noise. The U.S. Army Public Health Center conducted a noise assessment for the proposed action. The noise assessment considered the existing conditions at Fort Sill and used the BNOISE2 modeling program to evaluate changes in the noise environment at Fort Sill (U.S. Army Public Health Center 2022). The ROI includes Fort Sill as well as surrounding areas where potential noise impacts could occur.

### *3.2.2 Affected Environment*

The noise environment at Fort Sill primarily consists of four types of noise: transportation noise, noise from aircraft and vehicles, noise from firing at small-arm ranges, and noise from large-caliber weapons firing and military explosives operations. The Fort Sill ICUZ Study assesses Army activity noise levels against recommended noise limits for established uses of land (Fort Sill 2015). The recommended noise limits used in the ICUZ Study are identified in Table 3-4. The explosives and large-arm operations C-weighted day-night level zones from the ICUZ Study are shown on Figure 3-1. The LUPZs for large caliber weapons and demolitions currently extend beyond the Fort Sill Boundary in most directions. Zone II extends beyond the northern, eastern, and southern

boundaries and Zone III extends beyond the boundary in two areas of open/undeveloped land (U.S. Army Public Health Center 2022).

Fort Sill's noise management program is intended to minimize noise levels and impacts to the local community. The key components of this program include the development and maintenance of the ICUZ Study, aircraft fly-neighborly procedures, and the Army Compatible Use Buffer program. Fort Sill published the current ICUZ Study in 2015 and continues to implement the ICUZ practices and pursue conservation easements on lands impacted by training and operational noise.

### *3.2.3 Environmental Consequences*

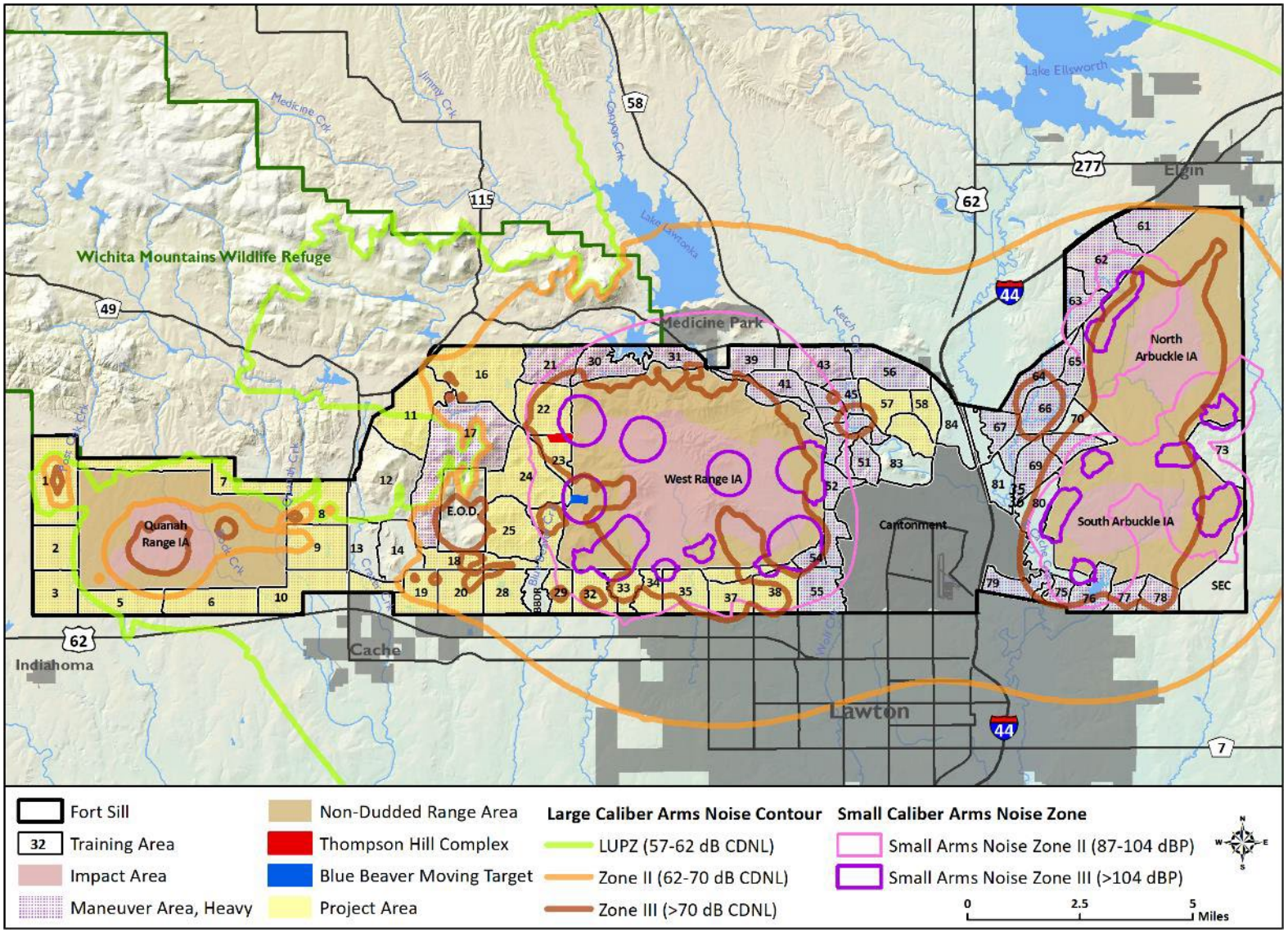
#### 3.2.3.1 No Action Alternative

Under the No Action Alternative, there would be no new activities associated with M-SHORAD training and operations. Implementation of the No Action Alternative would not result in significant noise impacts and noise levels would remain consistent with baseline conditions.

#### 3.2.3.2 Proposed Action

Noise impacts can occur from noise generated by vehicles during maneuvers and from small-arms fire (7.62-mm machine gun) and large arms fire (30 mm). Maneuver training and use of the ranges are anticipated to generate similar noise levels and types as are currently occurring in those locations. Training maneuvers would generate localized increases in noise qualitatively different from noise associated with a firing range but similar to the existing noise generated by other units performing maneuver training at Fort Sill. Noise would be temporary and intermittent, lasting only the duration of the training. The use of small arms (7.62 mm) would increase with the proposed action but the increase in small-arms use would not increase the size of the small-arms Noise Zones. Therefore, no additional analysis was required.

The primary source of noise associated with the proposed action would be the firing of the 30-mm cannon at the Thompson Hill Complex (see Figure 2-1). The proposed action would create a minor change to the LUPZ and Zone II along the northern boundary of Fort Sill. The majority of the changes occur on post in the areas immediately surrounding the Thompson Hill Complex. Zone III would not change outside the installation boundary. The increase to Zone II would not impact any additional noise-sensitive land uses beyond the boundary. These changes would be within the LUPZ and Zone II ICUZ boundary in the area west of Medicine Park. No significant impacts to the noise environment are anticipated to result from implementation of the proposed action.




Key: dB = decibels; CDNL = C-weighted day-night level; dBP = peak decibels; E.O.D. = explosive ordnance disposal; IA = Impact Area; LUPZ = Land Use Planning Zone

**Figure 3-1. Noise Contours at Fort Sill (ICUZ)**

## 3.3 BIOLOGICAL RESOURCES

### *3.3.1 Resource Definition and Methodology*

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 [ODWC]) 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.

### *3.3.2 Affected Environment*

#### 3.3.2.1 Vegetation and Wildlife

Fort Sill is located in an ecological transition area where tall-grass prairie merges with short-grass prairie and soil variation has created 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.

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 (*B. 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 Integrated Natural Resources Management Plan (INRMP) (USAFACFS 2020).

***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 (*P. leucopus*). Less frequently encountered are large herbivores such as mule deer (*Odocoileus hemionus*) and elk (*Cervus elaphus*), and large carnivores such as mountain lions *(Felis concolor).* Bison (*Bison bison*) inhabit the 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*), and the hoary bat (*Lasiurus cinereus*) (USAFACFS 2020).

***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 atricapillus)*, common grackle (*Quiscalus quiscula*), European starling (*Sturnus vulgaris*), turkey vulture (*Cathartes aura*), bobwhite quail (*Colinus virginianus*), mourning dove (*Zenaida macroura*), pheasants (*Phasianus colchicus*), 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 (USAFACFS 2020).

***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 (USAFACFS 2020).

***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 USAFACFS 2020). More recent observations have indicated a total of 54 known species, including a sighting of cottonmouth snakes (*Agkistrodon piscivorus*) in Cache Creek (USAFACFS 2020). 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 (USAFACFS 2020).

#### 3.3.2.2 Special Status Species

Special status plant and wildlife species are subject to regulations under the authority of federal and state agencies. The Endangered Species Act (16 *United States Code* [*USC*] 1532 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 (USAFACFS 2020).

"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.

The Migratory Bird Treaty Act (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 United States. 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 the potential to occur within the vicinity of Fort Sill proper (Table 3-5). The IPaC pull dated October 24, 2022, (Appendix D) identified three federally listed migratory bird species: piping plover (*Charadrius melodus*); whooping crane (*Grus americana*); and red knot (*Calidris canutus rufa*). No state-listed species were identified.

The ONHI database was reviewed for occurrence information on federal and state threatened, endangered, or candidate species as well as non-regulatory rare species and ecological systems of importance currently in the vicinity of the proposed action. ONHI listed one additional federally listed migratory bird species, the yellow-billed cuckoo (*Coccyzus americanus*) with a known occurrence in the vicinity of the action area. See ONHI report (OBS Ref. 2022-511-BUS-JUN) dated October 31, 2022.

**Table 3-5. Special Status Species with Potential to Occur within Fort Sill**

| Common Name | Scientific Name | Protection Status[a] | Habitat | Potential to Occur within Fort Sill |
|---|---|---|---|---|
| ***Mammals*** | | | | |
| Tricolored bat | *Perimyotis subflavis* | 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 |
| Yellow-billed cuckoo | *Coccyzus americanus* | Threatened | Woodlands, thickets, orchards, streamside groves. Breeds mostly in dense deciduous stands, including forest edges, tall thickets, dense second growth, overgrown orchards, scrubby oak woods. Often in willow groves around marshes. | Yes |
| 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 |

**Table 3-5. Special Status Species with Potential to Occur within Fort Sill (Continued)**

| Common Name | Scientific Name | Protection Status[a] | Habitat | Potential to Occur within Fort Sill |
|---|---|---|---|---|
| Red knot | *Calidris canutus rufa* | Threatened | Migrates annually between its breeding grounds in the Canadian Arctic and wintering regions, including the southeast United States, 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* | Candidate | Open areas with milkweed and flowering plants. | Yes |

[a] Federal.
Sources: ODWC 2022; ONHI 2022, USFWS 2022a.

Of the four federally listed migratory bird species (Table 3-5) identified as having the potential to occur in Comanche County, none have been documented nesting at Fort Sill (USAFACFS 2020). 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 (USAFACFS 2020). The red knot has never been observed at Fort Sill as of 2022. The yellow-billed cuckoo has been documented twice in Comanche County, however, both occurrences were outside of the installation at the WMWR (ONHI 2022).

Other bird species under federal protection at Fort Sill include any other species listed under the MBTA (16 *USC* 703-712). 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. 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, 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 (USAFACFS 2020).

The tricolored bat (*Perimyotis subflavis*) has a federal status of "Proposed Endangered" as of November 2022 (Proposed Rule 87 *Federal Register* 56381). While the tricolored bat (*Perimyotis subflavus*) has never been documented on the installation, records exist for the 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 bats. These foraging areas could include areas such as riparian zones along creek drainages and forest edges. 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 climate change (Proposed Rule 87 *Federal Register* 56381).

In a December 17, 2020, 12-month finding (85 *Federal Register* 81813), the USFWS determined that the monarch butterfly (*Danaus plexippus*) warranted listing as an endangered or threatened species under the Endangered Species Act. However, that listing was precluded by higher priority listing actions (i.e., species then determined to be at greater or more immediate risk). The primary threats to the monarch's biological status include habitat loss and degradation, herbicide use, drought, exposure to insecticides, and various effects of climate change (85 *Federal Register* 81813).

#### 3.3.2.3 Natural Resource Areas of Concern

The USFWS IPaC system was accessed to identify any National Refuge lands and invasive species management practices with potential to be affected by the action alternatives. The IPaC system identified the WMWR as a Natural Resource Area of Concern (USFWS 2022a). The 59,020-acre WMWR is located directly northwest of the installation (see Figure 1-1). The WMWR provides mixed-grass prairie, granite mountain, and freshwater lake and stream habitat to wildlife (USFWS 2022b). The WMWR is an ecosystem management partner of Fort Sill, collaborating on black-capped vireo management, wildfire protection, fish stocking, and trespass issues (USAFACFS 2020).

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 (USAFACFS 2020).

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 3-5 is present in Comanche County (USFWS 2022c).

### *3.3.3 Environmental Consequences*

#### 3.3.3.1 No Action Alternative

Under the No Action Alternative, no impacts to biological resources at Fort Sill or the areas surrounding Fort Sill would occur. Baseline biological resources conditions at Fort Sill would continue.

#### 3.3.3.2 Proposed Action

The potential for impacts to biological resources from the implementation of the proposed action would primarily be associated with training maneuvers. The increase in personnel associated with the proposed action is minimal (2.5 percent increase) and there are no construction activities associated with the proposed action. As such, the analysis of environmental consequences is limited to the activities associated with M-SHORAD training operations. The activities that could affect biological resources at Fort Sill would include maneuver training, live-fire training, and training involving targeting UAS.

##### *3.3.3.2.1 Vegetation and Wildlife*

Implementation of the M-SHORAD Bn stationing action in the associated TAs would include an increase in training maneuvers and weapon systems usage that could potentially impact vegetation and wildlife. Training activities that impact local wildlife could include, but are not limited to, vehicle maneuvers, UAS flights and their subsequent crashes, and habitat disturbance and noise associated with firing range activities.

Although maneuver training would be limited to existing TAs and utilize existing trails to access these TAs, the increased activity from heavy wheeled vehicles can cause high levels of disturbance. To aid in the mitigation of soil and ultimately vegetation disturbances, Fort Sill identified five basic management techniques to minimize military training effects to the soil and vegetation: (1) limit total use, (2) redistribute use, (3) modify kinds of use, (4) alter behavior of use, and (5) manipulate the natural resources for increased durability (U.S. Army Corps of Engineers

2018b). Additionally, in areas heavily impacted by training activities, TAs can be closed for rehabilitation. The Land Rehabilitation and Maintenance initiative of the Integrated Training Area Management (ITAM) Program manages soil and vegetation to improve and enhance training capacity through repair, maintenance, and reconfiguration of training land. Disturbed areas are reseeded using approved, site-specific seed mixes to reduce the potential establishment of invasive plant species. The use of these management techniques, in addition to the existing BMPs would result in no additional adverse impacts to existing vegetation while continuing to provide land rehabilitation for the affected areas.

As with current training, noise effects would be short-term and could temporarily affect wildlife in the immediate vicinity. Affected species would generally be able to return to affected areas after completion of training activities. While some wildlife might avoid the TAs long-term, the affected areas would be small compared to the availability of similar habitat nearby (U.S. Army Corps of Engineers 2018).

UAS would be used in air defense training missions with approximately 240 UAS crashing/landing and impacting the area each year. Debris from UAS and other associated debris would be collected and delivered to EQD for proper disposal. The use of UAS for air defense training missions is covered under the "Range Rule" (40 *CFR* S 266 Subpart M) (Fort Sill 2022a). The Range Rule states that munitions and targets, as components of a military weapon system, are not considered a solid waste when being used for their intended purpose. UAS and debris that fall into the dudded impact area cannot be safely recovered by personnel. If they cannot be recovered using unmanned methods they will remain in the dudded impact area and be recovered only after the range is closed and it is determined to be safe for personnel to enter. Impacts associated with the proposed action are anticipated to be minimal as the proposed use of munitions represents a minimal increase in usage at Fort Sill.

Impacts to biological resources are not anticipated to be significant and would not result in long-term effects on population viability of biological resources. It is anticipated that resident wildlife would continue to avoid the impact areas proposed for use, as has previously been documented (USAFACFS 2018).

#### *3.3.3.2.2 Special Status Species*

Based on a review of the USFWS IPaC database, ONHI database, and ODWC records, four threatened or endangered birds were identified as having the potential to occur within the action area. However, none of these species have been documented on Fort Sill and no impacts to federally listed species are anticipated to result from implementation of the proposed action.

Two species that are not listed as threatened or endangered and are listed in the USFWS IPaC database are the tricolored bat and monarch butterfly. Implementation of the proposed action would not jeopardize populations of the tricolored bat as this species has not been documented at Fort Sill and the proposed action would not impact potential habitat for the species. No impacts to the monarch butterfly are anticipated as a result of implementing the proposed action since the potential habitat along existing trails and roads is limited due to ongoing training and disturbance.

Regarding migratory birds, the existing body of research is not definitive as to the specific effects that UAS overflights may have on these species but suggests that noise and intrusion would not be likely to adversely affect migratory birds. UAS generally operate at altitudes of <500 meters, which is consistent with the altitudes at which most birds fly. Hillman et al. (2015) studied multiple human disturbances on nesting behaviors of the least tern (*Sternula antillarum*), common tern (*Sterna hirunda*), gull-billed tern (*Gelochelidon nilotica*), and black skimmer (*Rynchops niger*), and found no evidence that military or civilian aircraft adversely affected incubation behavior for

these species. DeRose-Wilson et al. (2015) determined that Wilson's plovers (*Charadrius wilsonia*) were more alert and scanned more during military rotorcraft overflights and also scanned more during military and civilian fixed-wing overflights, but heart rates and incubation rates did not change during any overflights, suggesting that there was not a direct link between increased vigilance and decreased reproductive success for this species. In a review of UAS impacts to wildlife, it was found that birds demonstrate the highest level of sensitivity, with overall disturbances and increased response to the presence of UAS as bird body size grew (Mulero-Pázmány et al. 2017). Significant impacts to migratory bird species are not anticipated to result from implementation of the proposed action.

#### *3.3.3.2.3 Natural Resource Area of Concern*

The USFWS IPaC system was accessed on October 24, 2022, to identify protected species, National Refuge lands, and invasive species management practices with the potential to be affected by the proposed action. The IPaC system identified the WMWR as a Natural Resource Area of Concern (USFWS 2022a). The 59,020-acre WMWR is located directly northwest of the installation (see Figure 1-1). Because all activities associated with stationing the M-SHORAD Bn at Fort Sill would remain in the installation boundary, direct impacts to WMWR are not anticipated to result from implementation of the proposed action. Noise contours would extend into the WMWR near the northern boundary of the installation and east of the intersection of State highways 115 and 49. Noise levels in these areas would be above the current baseline at Fort Sill but still less than the historical levels shown in Figure 3-1.

## 3.4 CULTURAL RESOURCES

### *3.4.1 Resource Definition and Methodology*

The National Historic Preservation Act (NHPA) was passed into law in 1966 to help stop the inadvertent loss of historic properties significant to our heritage. 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. The DOI is responsible for designating the "Keeper of the Register" (Keeper). Per 36 *CFR* 60.3(f), the Keeper is the individual who has been delegated the authority by the DOI to list properties and determine their eligibility for the NRHP. The current Keeper is the National Park Service, National Register Chief.

As defined by Fort Sill and as used in the 2014 Fort Sill Integrated Cultural Resources Management Plan (ICRMP) (Fort Sill 2014), "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 (ARPA) (54 *USC* 302107) and the Archeological and Historic Preservation Act (AHPA) (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 cultural resources management program at Fort Sill has responsibility for compliance with Sections 106 and 110 of the NHPA, as well as the ARPA, AHPA, NAGPRA, AIRFA, EO 13007, and EO 13175, *Consultation and Coordination with Indian Tribal Governments*. Responsibilities of the Fort Sill cultural resources management program are outlined in the ICRMP, which covers a wide diversity of cultural resources on the installation in compliance with ARs, federal legislation, and applicable guidelines.

Impact analysis for cultural resources focuses on assessing whether implementation of an alternative would have the potential to affect cultural resources that are eligible for listing in the NRHP or have traditional significance for tribes. For this EA, impact analysis for cultural resources focuses on, but is not limited to, guidelines and standards set forth in the implementing regulations (36 *CFR* 800) of NHPA Section 106. Under Section 106 of the NHPA, the proponent of the action is responsible for determining whether any historic properties are located in the area, assessing whether the proposed undertaking would adversely affect the resources, and notifying the State Historic Preservation Office (SHPO) of any adverse effects. 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 SHPO and federally recognized tribes to develop measures to avoid, minimize, or mitigate the adverse effects of the undertaking.

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 is the Heavy Maneuver TAs (TAs 1–10, with limited use in 4 and 7 because of their locations, and TAs 11, 15, 16, 18, 19, 20, 22–29, 32–38, and 57–59). The APE is the same for both direct and indirect impacts.

### *3.4.2 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 1977, 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. Approximately 162 Category 1 sites have been Identified in the APE. Twenty-three of these sites are NRHP eligible, 135 are listed as not eligible, and 4 are listed as pending. One Category 2 site is located in the APE and is listed as pending. None of these sites have been identified as sacred or Traditional Cultural Properties.

EO 13007 identifies Native American sacred sites as special floral, faunal, and mineral areas that contain resources used in religious ceremonies, among other natural and cultural resources. Confidentiality and access to these sites is mandated by EO 13007 and the AIRFA. For these reasons, no maps or descriptions are publicly available.

### *3.4.3 Environmental Consequences*

#### 3.4.3.1 No Action Alternative

Under the No Action Alternative, there would be no new activities associated with M-SHORAD training and operations. Implementation of the No Action Alternative would not result in significant impacts to cultural resources at Fort Sill or the areas surrounding Fort Sill.

#### 3.4.3.2 Proposed Action

As described in Section 3.4.2, 163 cultural resource sites are present within the heavy maneuver TAs proposed for use. Sites include those that have been determined not eligible, those that are pending evaluation, and those that are eligible for listing in the NRHP.

All sites are located in TAs that are currently used for heavy maneuver training. All sites 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 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.

Fort Sill consults with Native American tribes to provide access to sacred sites located on Fort Sill, including plants, animals, and landscapes considered sacred. However, in accordance with AR 200-1, the Garrison Commander could impose reasonable restrictions and conditions on access to sacred sites on Fort Sill for the protection of health and safety or for reasons of national security.

As part of the scoping phase of this project, Fort Sill sent a combined scoping and Section 106 letter to nine different Native American tribes (Appendix A). The Comanche Nation responded on December 19, 2022. The letter from the Comanche Nation stated that the location of the project has been cross-referenced with the Comanche Nation site files where an indication of "No Properties" have been identified (Appendix A).

In addition to consulting with the tribes, the Army consulted with the Oklahoma SHPO regarding the APE and a determination of no historic properties affected. As part of the scoping phase of this project, Fort Sill sent a scoping and Section 106 letter to the Oklahoma SHPO. On December 1, 2022, the SHPO responded and stated that they concur with the Fort Sill opinion that the undertaking would have no effect on historic properties (Appendix A).

As part of the scoping phase of this project and per the cooperative agreement between the Oklahoma SHPO and the Oklahoma Archaeological Society (OAS), Fort Sill also sent a scoping

and Section 106 consultation letter to the OAS. On November 29, 2022, the OAS responded and stated that they crosschecked the project location with the state files for archaeological sites and no sites are listed as occurring in the project area and an archaeological inspection is not required but encouraged Fort Sill to contact the OAS if archaeological materials are discovered (Appendix A).

## 3.5 SOIL AND GEOLOGIC RESOURCES

### *3.5.1 Resource Definition and Methodology*

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. Rock formations on Fort Sill are varied and include igneous, limestones, dolomites, shales, sandstones, conglomerates and unconsolidated alluvium (USAFACFS 2020). Geologic resources are evaluated to identify areas of geologic hazard.

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 (FPPA) 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 FPPA.

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. The ROI includes TAs 1–10, with limited use in 4 and 7 because of their locations, and TAs 11, 15, 16, 18, 19, 20, 22–29, 32–38, and 57–59.

### *3.5.2 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 (OGS 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 (Soil Survey Staff 2022). 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 (Fort Sill 2016). 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. For these reasons, Fort Sill has adopted an aggressive soil erosion management policy.

In an effort to comprehensively manage and protect soil resources on Fort Sill, the INRMP (USAFACFS 2020) 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.

### *3.5.3 Environmental Consequences*

#### 3.5.3.1 No Action Alternative

Under the No Action Alternative, there would be no new activities associated with M-SHORAD training and operations. The No Action Alternative would not result in significant impacts to soil and geologic resources at Fort Sill or the areas surrounding Fort Sill.

#### 3.5.3.2 Proposed Action

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

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.

The proposed training activities represent a 0.03 percent increase in personnel. Soils would be temporarily impacted when the TAs are in use, but sites would be regraded to pre-activity conditions and vegetation would be reestablished when the TAs are not being used. The TAs would be used on a rotational cycle (i.e., one TA would be utilized during the vegetative recovery period of another TA) as deemed necessary. Training restrictions would be instituted by Range Operations to minimize erosion and sedimentation issues. Therefore, implementation of the training activities would not result in significant soil impacts.

Relatively small percentages of prime farmland soils are located in the ROI. These soils are located in areas currently utilized as maneuver area heavy TAs and have been subject to ongoing disturbance. Prime farmland soils would not be irreversibly converted (directly or indirectly) to nonagricultural use by the proposed battalion-level training activities; therefore, no significant impacts to prime farmland soils would result from implementation of the proposed training.

## 3.6 WATER RESOURCES

### *3.6.1 Resource Definition and Methodology*

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 0.2 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 M-SHORAD at Fort Sill. The footprint would consist of Building 2454, selected TAs, and various existing ranges. Building 2454 would be used for hazardous material storage and tactical equipment maintenance. The TAs would be used to support maneuver training and would include TAs 1–10, with limited use in 4 and 7 because of their locations, and TAs 11, 15, 16, 18, 19, 20, 22–29, 32–38, and 57–59. The impacts of new personnel and dependents on water resources would not be considered in the analysis because the number of people associated with stationing of M-SHORAD (550 Soldiers and 760 dependents) would be a small fraction (2.5 percent) of the existing population of about 53,000 at Fort Sill (Military OneSource 2022).

### *3.6.2 Affected Environment*

The following subsections provide a general summary of water resources on Fort Sill.

#### 3.6.2.1 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 (OWRB 2012; Figure 3-2). 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 (USAFACFS 2020). 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 (Figure 3-2), are used for potable water supply by Fort Sill and the City of Lawton (USAFACFS 2020).

#### 3.6.2.2 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 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.

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 (Belden et al. 1996).

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 (Belden et al. 1996). Recharge is through precipitation on floodplains and stream bed infiltration.

#### 3.6.2.3 Wetlands

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 (USAFACFS 2020). Wetlands are present in the TAs that would be used during M-SHORAD training.

#### 3.6.2.4 Floodplains

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 TAs that would be used during M-SHORAD training (FEMA 2009, 2016).

### *3.6.3 Environmental Consequences*

In general, the changes that could result in environmental consequences associated with the establishment of new operations at a military installation include increases in personnel and dependents, new construction if required, and activities associated with the new operations. The increase in personnel and dependents associated with implementation of the proposed action at Fort Sill would be minor as the increase in personnel represents a small fraction (2.5 percent) of the current population at Fort Sill. No construction is associated with implementation of the

proposed action and there would be no land disturbance activities associated with construction. Therefore, the analysis of environmental consequences is limited to the activities associated with M-SHORAD Bn training operations. The activities that may affect water resources at Fort Sill include:

- Maneuver training with the M-SHORAD weapon system in the selected existing TAs.
- Live-fire training with 7.62-mm machine guns and 30-mm cannons at the Thompson Hill Complex and the Blue Beaver Moving Target range.
- Training with UAS as targets.
- Tactical equipment maintenance at Building 2454.
- Hazardous material storage at Building 2454, although this is not expected to be a significant amount.

#### 3.6.3.1 No Action Alternative

Under the No Action Alternative, there would be new activities associated with M-SHORAD training and operations. Implementation of the No Action Alternative would not result in significant impacts to water resources at Fort Sill or the areas surrounding Fort Sill.

#### 3.6.3.2 Proposed Action

##### *3.6.3.2.1 Surface Water*

The analysis described below focuses on the impacts of M-SHORAD Bn stationing activities on surface water quality. Although Fort Sill relies on surface water for potable water supply (Lakes Lawtonka and Ellsworth) (U.S. Army Corps of Engineers 2018a), the additional water demand from the proposed action is not expected to be significant due to the small number of personnel associated with basing the M-SHORAD Bn at Fort Sill.

M-SHORAD maneuver training would be conducted in the TAs shown in Figures 2-1 and 3-2. These figures also show surface water features that are present in these areas. Maneuver training involves moving heavy equipment across the landscape, which can result in vegetation and soil disturbance that can lead to erosion and increase in sediment load on adjacent surface waters. However, M-SHORAD maneuver training would be conducted on existing trails that would be accessed through use of existing suitable roads and bridges.

Fort Sill mitigates the negative effects of maneuver training through coordination of training activities with the Fort Sill EQD (U.S. Army Corps of Engineers 2018b) and adherence to the ITAM program. Prior to training, proposed training activities and training site locations are coordinated with the Fort Sill EQD to screen for and avoid sensitive areas, including highly erodible soils and steep slopes. Detailed recovery plans are also required prior to training to ensure that the land would be recovered following training exercises. The practice of coordination with Fort Sill EQD would be implemented with M-SHORAD maneuver training activities. Furthermore, soil management at Fort Sill is accomplished through the Land Rehabilitation and Maintenance aspect of the Army's ITAM program (USAFACFS 2020). Under this program, Fort Sill implements BMPs and training restrictions to minimize erosion and sedimentation issues. For example, Fort Still requires the terrain profile to be restored to its original condition after training exercises.

Various ranges at Fort Sill could be used for training with 7.62-mm machine guns and 30-mm cannons. Deposition of munitions constituents can occur on surface soils at firing points and impact areas. Surface water quality can be degraded if soil from the firing points and impact areas are eroded and

carried by surface runoff to nearby water bodies. However, soil management practices at Fort Sill that are designed to control erosion would also prevent munitions constituents from moving into streams and degrading surface water quality. In addition, the Army routinely monitors the accumulation of munitions chemical residues and, when required, takes steps to prevent leaching or erosion to surface water. A monitoring program for active ranges at Fort Sill includes analysis of samples from runoff, sediment, and soil.

UAS target-related training is not expected to significantly impact to surface waters because training scenarios would be designed to facilitate UAS recovery and would be conducted in accordance with the Range Rule (40 *CFR* S 266 Subpart M). The Range Rule states that UAS, as a component of a military weapon system, are not considered solid waste when being used for their intended purpose. Once the material is recovered, it must be characterized pursuant to the Resource Conservation and Recovery Act. The recovered UAS and any associated debris would be bagged and delivered to Fort Sill EQD for proper disposal.

Spills from hazardous material storage and tactical equipment maintenance at Building 2454 could potentially impact an unnamed tributary of Sitting Bear Creek located about 400 feet west of the building. However, the potential impact of these activities at Building 2454 and other facilities on nearby surface waters is controlled through the implementation of Fort Sill's combined Spill Prevention, Control, and Countermeasures Plan and Installation Spill Contingency Plan (SPCCP/ISCP) (U.S. Army Corps of Engineers 2019). The Fort Sill SPCCP/ISCP fulfills the Army's requirement for developing a spill prevention and contingency program that establishes responsibilities, duties, procedures, and resources to be used to contain, mitigate, and cleanup oil and hazardous substance spills. In addition to the installation-wide SPCCP/ISCP, there is a facility-specific SPCCP/ISCP for Building 2454 (Fort Sill 2021a). A copy of the facility-specific SPCCP/ISCP is kept at Building 2454 and is designed to be easily used by site personnel in the event of a spill or release. In addition to spill response, the SPCCP/ISCP requires measures to prevent or mitigate the effects of spills including routine inspections of storage facilities and secondary containment.

Stormwater runoff from Building 2454 can also potentially impact the unnamed tributary of Sitting Bear Creek. Such effects would be addressed through the implementation of Fort Sill's Stormwater Management Plan (SWMP) (Fort Sill 2021b). The SWMP defines the proper handling of hazardous material as well as BMPs to reduce the contamination of stormwater runoff. The requirements in the

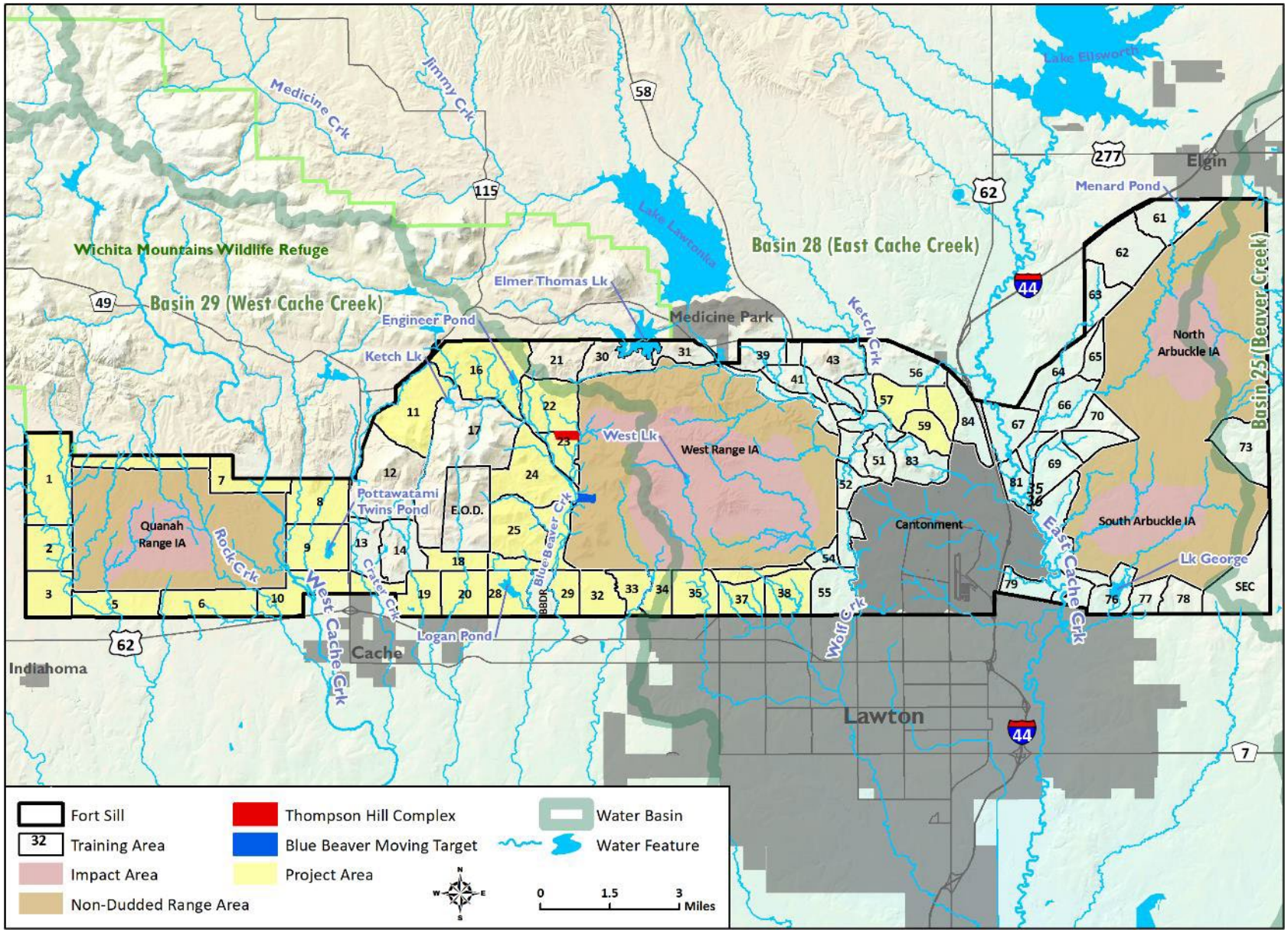



**Figure 3-2. Water Resources at Fort Sill**

SWMP apply to Building 2454 and therefore addresses activities in this building related to M-SHORAD operations.

In summary, stationing and training of the M-SHORAD Bn would not result in significant impacts to surface waters.

#### *3.6.3.2.2 Groundwater*

Measures in place to protect Fort Sill surface waters described in the previous subsection will also protect aquifers from contamination. For example, 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 SPCCP/ISCP as well as BMPs and good housekeeping required in the SWMP will prevent contaminants from reaching the aquifers in the area.

No impacts to groundwater would result from implementation of the proposed action (stationing of M-SHORAD Bn at Fort Sill) and impacts to groundwater would not be significant.

#### *3.6.3.2.3 Wetlands and Floodplains*

Since no new construction is required for stationing of the M-SHORAD Bn at Fort Sill, there would be no impacts to wetlands and floodplains from construction-related activities. Wetlands do occur in the TAs, however these would be protected through coordination of M-SHORAD training activities with EQD to ensure that area wetlands will 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 (USAFACFS 2020). Such restrictions enhance the protection of wetlands on Fort Sill and would be protective should the M-SHORAD Bn be stationed at Fort Sill.

There is a wetland that occurs approximately 1,000 feet from Building 2454 along the flowpath of the unnamed tributary of Sitting Bear Creek. Spill containment and prevention measures in the SPCCP/ISCP as well as BMPs and good housekeeping required in the SWMP designed to protect the tributary of Sitting Bear Creek will also prevent contaminants from reaching this wetland.

## 3.7 LAND USE

### *3.7.1 Resource Definition and Methodology*

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.

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 TA 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. The ROI includes TAs 1–10, with limited use in 4 and 7 because of their locations, and TAs 11, 15, 16, 18, 19, 20, 22–29, 32–38, and 57–59.

### *3.7.2 Affected Environment*

Land use on Fort Sill is primarily designated for military training and operational purposes. The installation is divided into the cantonment area, maneuver TAs, live-fire training ranges, artillery firing points, ordnance impact areas, and areas unsuitable for training. The cantonment area and areas unsuitable for training (landfill, recreation area, cultural sites, ammunition supply point, etc.) comprise approximately 8,312 acres. The cantonment area contains the administrative areas, medical facilities, the Henry Post Army Airfield, the Fort Sill National Cemetery, family housing, barracks, and other Soldier housing. The maneuver TAs comprise approximately 45,266 acres (heavy, 38,735 acres; light, 6,531 acres). These areas provide land for outdoor dismounted maneuver training and mounted heavy and light vehicle maneuver training.

The three primary ranges on Fort Sill are East Range, West Range, and Quanah Range. East Range consists of rolling prairie and the bottomlands associated with East Cache Creek. Interstate 44 separates the East Range from the West Range. The West Range varies topographically from small stream bottoms on the east to rugged granite outcrops to the north and west. On the far west side of the installation, Quanah Range consists of rolling topography with prairie land interspersed with stream bottoms and wooded areas. The remaining 39,991 acres consist of the three live-fire training range, impact areas (dudded and non-dudded), and other non-maneuver related TAs.

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 (RLTP) and the ITAM program. The RLTP 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).

### *3.7.3 Environmental Consequences*

#### 3.7.3.1 No Action Alternative

Under the No Action Alternative, there would be no new activities associated with M-SHORAD training and operations. The No Action Alternative would not result in significant impacts to land use at Fort Sill or the areas surrounding Fort Sill.

#### 3.7.3.2 Proposed Action

Implementation of the proposed action would mean that additional M-SHORAD battalion-level training would occur at Fort Sill. Section 2.1 describes the activities that would be associated with this training. No new TAs, firing points or ranges are proposed as part of the proposed action. Conducting training activities that already occur at Fort Sill would not result in additional land use impacts. Heavy maneuver training already occurs in the TAs proposed for use and the types of activities associated with this action would be similar to what occurs today on Fort Sill. The proposed training activities would be consistent and compatible with land use in the TAs and ranges at Fort Sill, and would represent a minor increase in training activities (0.03 percent increase in personnel and a 0.7 percent increase in vehicle usage). Coordination with Range Operations is required per Fort Sill Regulation 385-1. Range Operations has developed and approved new SDZs for the 30-mm cannon to be used at the Thompson Hill Range Complex

(Appendix B). The new SDZs are consistent with other SDZs at Thompson Hill Range Complex and would not result in land use changes. Range Operations would schedule proposed training activities in accordance with current Fort Sill range use policies to prevent competing uses. Changes to land use from implementation of the Proposed Action are not anticipated and impacts to land use would not be significant.

## 3.8 SAFETY

### *3.8.1 Resource Definition and Methodology*

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 and continues to be an integral part of the Army's mission at Fort Sill. Activities on Fort Sill 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 of Fort Sill.

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." This mission is fully supported by the Army Installation Management Command (IMCOM) safety mission. With regard to installation support, IMCOM is Fort Sill's superior command.

AR 385-10, the "Safety Regulation," establishes risk management as the Army's principal risk reduction methodology and ensures regulatory and statutory compliance. It provides for public safety relative to Army operations and activities.

The ROI includes TAs 1–10, with limited use in 4 and 7 because of their locations, and TAs 11, 15, 16, 18, 19, 20, 22–29, 32–38, and 57–59, as well as Thompson Hill Complex and the Blue Beaver Moving Target Range. Impacts to safety are evaluated according to the potential to increase or decrease in safety risks to personnel, the public and property. If implementation of the proposed action would result in a major variance from baseline conditions, it would be considered a significant safety impact.

### *3.8.2 Affected Environment*

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 and safe and healthy work places, and ensures compliance with applicable laws and regulations. Fort Sill also has its own health and safety regulations, contained in Fort Sill Regulation 385-10, 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 (DoDI) 6055 Series, and AR 385-10. In addition, the Fort Sill Installation Design Standard identifies principles of sustainable design that address safety considerations such as antiterrorism force protection standards that are required of all projects constructed on military installations.

Munitions and explosives of concern (MECs), such as unexploded ordnance, are a safety concern at Fort Sill. The installation has specific procedures and land use controls which must be followed prior to ground-disturbing activities to minimize MEC-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 meet developed areas. Fort Sill maintains

an Integrated Wildland Fire Mitigation Plan to help prevent and manage wildfires at the installation (Fort Sill 2018a).

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 Fort Sill gates are manned and there is controlled/limited access to Fort Sill. Fort Sill maintains an Installation Emergency Management Plan (Fort Sill 2022b) as well as detailed emergency and mishap response plans for the various tenants, units, directorates, and agencies at Fort Sill. These plans assign agency responsibilities and prescribe functional activities necessary to react to major mishaps.

### *3.8.3 Environmental Consequences*

#### 3.8.3.1 No Action Alternative

Under the No Action Alternative, there would be no new activities associated with M-SHORAD training and operations. The No Action Alternative would not result in significant impacts to safety at Fort Sill.

#### 3.8.3.2 Proposed Action

Implementation of the proposed action would mean that additional battalion-level maneuver training would occur at Fort Sill. Section 2.1 describes the activities that would be associated with this training. The proposed training is not anticipated to create health and safety issues different from the training activities that already occur at Fort Sill. The proposed training activities would be consistent and compatible with the existing TAs and ranges at Fort Sill (see Figure 2-1). SDZs for the proposed action have been prepared and approved by the Fort Sill Range Manager and firing of the 30 mm cannon from the Thompson Hill Complex is compatible with the existing range and impact areas (Appendix B). Coordination with Range Operations would be required three weeks prior to training per Fort Sill Regulation 385-1.

Fort Sill maintains detailed emergency and mishap response plans to react to an accident, should one occur. These plans assign agency responsibilities and prescribe functional activities necessary to react to major mishaps on or off the range. No significant health and safety impacts are anticipated to result from the proposed action if all applicable Army Safety Program requirements are implemented.

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# 4. CUMULATIVE EFFECTS

Actions that have a potential to interact with the proposed action at Fort Sill are included in this cumulative effects analysis. This approach enables decision makers to have the most current information available so that they can evaluate the range of environmental consequences that would result from implementation of the proposed action at Fort Sill.

In this chapter, the Army has identified past and present actions in the region of Fort Sill. This analysis also evaluates reasonably foreseeable future actions that are in the planning phase in this region.

The assessment of cumulative effects begins with defining the scope of other project actions and the potential interrelationship with the proposed action (CEQ 1997). The scope of the analysis must consider other projects that coincide with the location and timetable of implementation of the proposed action at Fort Sill. Cumulative effects 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. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time (40 *CFR* 1508.1).

For the proposed action under consideration to have cumulatively significant impact two conditions must be met. First, the combined impacts of all identified past, present, and reasonably foreseeable projects, activities, and processes on a resource, including the impacts of the proposed action, must be significant. Second, the proposed action must make a substantial contribution to that significant cumulative impact. Proposed actions of limited scope do not typically require as comprehensive an assessment of cumulative impacts as proposed actions that have significant environmental impacts over a large area (CEQ 2005).

In the following sections, the cumulative significance is based on the context, intensity, and timing of the proposed action relative to the past, present, and reasonably foreseeable actions. A summary of the cumulative effects is provided, followed by a discussion of the resources that have potentially significant cumulative effects based on the evaluation criteria described herein.

## 4.1 PAST, PRESENT, AND REASONABLY FORESEEABLE ACTIONS

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

Table 4-1 summarizes past, present, and reasonably foreseeable 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), and indicates which resources could potentially interact with the proposed action at Fort Sill. No other actions were identified for this EA during the data gathering and field survey phases at Fort Sill.

Past activities are those actions that occurred within the geographic scope of cumulative effects that have shaped the current environmental conditions of the project area. For most resources (e.g., soil and geologic resources, water resources, and biological resources), the impacts of past actions are now part of the existing environment and are incorporated in the description of the affected environment in Chapter 3.

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

| Action | Proponent/ Location | Timeframe | Description | Resource Interaction |
|---|---|---|---|---|
| **Military Actions** | | | | |
| Joint Counter-Unmanned Aircraft Systems (C-UAS) Training University | Fort Sill | Future | The Joint C-UAS Training University could potentially be stationed at Fort Sill. Stationing of the C-UAS would bring an unknown number of personnel and equipment to the installation and may require additional infrastructure and facilities to support the stationing. C-UAS would also require access to ranges and training areas capable of support UAS and C-UAS missions. | Air Quality, Noise, Biological Resources, Cultural Resources, Soil and Geologic Resources, Water Resources, Land Use, and Safety |
| Wichita House Privatization | Fort Sill | Present, future | Housing Privatization – Project to convey Wichita House and its ancillary supporting facility to a public/private partnership as part of the Military Housing Privatization Initiative. In addition to the conveyance of the buildings, a 50-year lease would be granted to Sill Communities, LLC. Wichita House is a contributing building to the Fort Sill Historic District. | Cultural Resources |
| Iron Dome Defense System-Army (IDDS-A). | Fort Sill | Present, future | Field one or two batteries of IDDS-A. One IDDS-A battery would consist of approximately 60 Soldiers, 13 Heavy Expanded Mobility Tactical Trucks, six Missile Firing Units, one radar system, battle management and communications systems, and support equipment. In addition, all Soldiers would be equipped with a standard selection of small arms and equipment. | Air Quality, Noise, Biological Resources, Cultural Resources, Soil and Geologic Resources, Water Resources, Land Use, and Safety |
| **Local Actions** | | | | |
| City of Lawton Development | City of Lawton | Present, future | There are several improvements being made in and around the city of Lawton. Infrastructure improvements are ongoing around Cache Road to allow for additional increased development in that area. There is the potential for the development of an industrial park south of Southeast Bishop Road. There is also growth potential in the southern portion of the city near the southern border of city limits. In addition, there is industrial development potential in the far western portion of the city near the city limits. Rezoning for a low-density residential subdivision is planned south of the installation along South Boundary Road (Fort Sill 2018b). | Noise, Soil and Geologic Resources, Water Resources |

Key: C-UAS = Counter-Unmanned Aircraft Systems; IDDS-A = Iron Dome Defense System-Army; UAS = unmanned aircraft systems.

## 4.2 CUMULATIVE EFFECTS ANALYSIS

This section evaluates the cumulative effects from the past, present, and reasonably foreseeable future actions (see Table 4-1) relative to the implementation of the proposed action and alternatives. Table 4-2 provides a summary of the cumulative effects. As shown in Table 4-2, there are possible interactions between this project and past, present, and reasonably foreseeable future actions for the following resource areas: air quality, noise, biological resources, soil and geologic resources, and water resources. No impacts to land use, cultural resources or safety are anticipated with the proposed action and no cumulative effects are anticipated when the impacts of past, present, and reasonably foreseeable actions are considered in combination with the proposed action.

**Table 4-2. Summary of Cumulative Effects for Fort Sill**

| Resource Area | Alternative 1 | Past, Present, and Reasonably Foreseeable Actions | Cumulative Effects |
|---|---|---|---|
| Air Quality | ◘ | ◘ | ◘ |
| Noise | ◘ | ◘ | ◘ |
| Biological Resources | ◘ | ◘ | ○ |
| Cultural Resources | ○ | ○ | ○ |
| Soil and Geologic Resources | ◘ | ◘ | ◘ |
| Water Resources | ◘ | ◘ | ◘ |
| Land Use | ○ | ○ | ○ |
| Safety | ○ | ○ | ○ |

Key: ○ = not affected or beneficial impacts, ◘ = affected but not significant, short to medium term, impacts that range from low- to high-intensity.

### *4.2.1 Air Quality*

Future actions such as the Iron Dome Defense System-Army (IDDS-A) and the Joint Counter-Unmanned Aircraft Systems (C-UAS) Training University have the potential to contribute additional air quality pollutants similar to the increases of the proposed action. Cumulative impacts to air quality resulting from implementation of the proposed action in conjunction with past, present, and reasonably foreseeable future actions at Fort Sill would not be significant.

### *4.2.2 Noise*

Future actions such as the IDDS-A and the Joint C-UAS Training University have the potential to have noise related impacts similar to noise impacts associated with the proposed action. Cumulative impacts due to noise resulting from implementation of the proposed action in conjunction with past, present, and reasonably foreseeable future actions at Fort Sill would not be significant.

### *4.2.3 Biological Resources*

Future actions such as the IDDS-A and the Joint C-UAS Training University have the potential to impact biological resources in the same manner as the proposed action. Cumulative impacts to biological resources resulting from implementation of the proposed action in conjunction with past, present, and reasonably foreseeable future actions at Fort Sill would not be significant.

### *4.2.4 Soil and Geologic Resources*

Training-related activities associated with the proposed action would occur near other ongoing and future training and could occur during the same time periods. Ongoing training is essential to the

mission at Fort Sill and such training has been and will continue to be a regular occurrence on the installation. Fort Sill actively manages the ranges and TAs to minimize and mitigate disturbances to soils due to this and other training activities. Cumulative impacts to soil and geologic resources resulting from implementation of the proposed action in conjunction with past, present, and reasonably foreseeable future actions at Fort Sill would not be significant because BMPs would be implemented and erosion controls would be established.

### *4.2.5 Water Resources*

Training-related activities associated with the proposed action would occur near other ongoing and future training and could occur during the same time periods. Ongoing training is essential to the mission at Fort Sill and such training has been and will continue to be a regular occurrence on the installation. Fort Sill actively manages the ranges and TAs to minimize and mitigate disturbances to soils that have the potential to impact water quality. Cumulative impacts to water resources resulting from implementation of the proposed action in conjunction with past, present, and reasonably foreseeable future actions at Fort Sill would not be significant because BMPs would be implemented and erosion controls would be established.

## 4.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the impacts to future generations that would result from use of these resources. Irreversible impacts primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable timeframe (e.g., energy and minerals). Irretrievable resource commitments also involve the loss in value of an affected resource that cannot be restored as a result of the action. Implementation of the proposed action would involve the consumption of nonrenewable resources such as petroleum based products.

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# 6. RELEVANT ENVIRONMENTAL LAWS, REGULATIONS, AND POLICIES

This EA has been prepared in consideration of and compliance with relevant environmental laws, regulations, and policies. These include, but are not limited to, federal laws, regulations, and EOs and military regulations and instructions (e.g., DoDIs, and Army and Fort Still Regulations) listed herein.

## 6.1 FEDERAL LAWS AND REGULATIONS

### *6.1.1 Federal Laws*

- 15 *USC* 2651 – Asbestos Hazard Emergency Response Act
- 16 *USC* 703-712 – Migratory Bird Treaty Act
- 16 *USC* 1532 et seq. – Endangered Species Act
- 25 *USC* 3001 et seq. – Native American Graves Protection and Repatriation Act
- 42 *USC* 1996 – American Indian Religious Freedom Act
- 42 *USC* 6901 et. seq. – Resource Conservation and Recovery Act
- 42 *USC* 9620 – Community Environmental Response Facilitation Act of 1992
- 42 *USC* 11001-11050 – Establishment of State Commissions, Planning Districts, and Local Committees
- 49 *USC* § 40102 – Definitions
- 49 *USC* § 40103 – Sovereignty and Use of Airspace
- 54 *USC* 469 – Archeological and Historic Preservation Act
- 54 *USC* 300308 – National Historic Preservation Act
- 54 *USC* 302107 – Archaeological Resources Protection Act

### *6.1.2 Federal Regulations*

- Title 7 *CFR* 658: Farmland Protection Policy Act
- Title 14 *CFR* 73: Special Use Airspace
- Title 14 *CFR* § 77: Safe, Efficient Use, and Preservation of the Navigable Airspace
- Title 24 *CFR* 51: Environmental Criteria and Standards
- Title 32 *CFR* 651: Environmental Analysis of Army Actions
- Title 36 *CFR* 60: National Register of Historic Places
- Title 36 *CFR* 79: Curation of Federally-Owned and Administered Archaeological Collections
- Title 36 *CFR* 800: Protection of Historic Properties
- Title 40 *CFR* 61: National Emission Standards for Hazardous Air Pollutants
- Title 40 *CFR* 112: Oil Pollution Prevention

- Title 40 *CFR* 261: Identification and Listing of Hazardous Waste
- Title 40 *CFR* 279: Standards for the Management of Used Oil
- Title 40 *CFR* 302: Designation, Reportable Quantities, and Notification
- Title 40 *CFR* 700-766: Protection of Environment
- Title 40 *CFR* 1500-1508: Council on Environmental Quality

### *6.1.3 Executive Orders*

- EO 11988, Floodplain Management
- EO 12196, Occupational Safety and Health Programs for Federal Employees
- EO 12372, Intergovernmental Review of Federal Programs
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- EO 13007, Indian Sacred Sites
- EO 13045, Protection of Children from Environmental Health Risks and Safety Risks
- EO 13112, Invasive Species
- EO 13175, Consultation and Coordination with Indian Tribal Governments
- EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds
- EO 13990, Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis

## 6.2 OTHER REGULATIONS AND INSTRUCTIONS

### *6.2.1 Army and Fort Sill Regulations*

- AR 190-5, Motor Vehicle Traffic Supervision
- AR 200-1, Environmental Protection and Enhancement
- AR 210-20, Real Property Master Planning for Army Installations
- AR 350-19, Army Sustainable Range Program
- AR 385-10, Army Safety Program
- AR 385-63, Range Safety
- Army Directive 2017-07 – Installation Energy and Water Security Policy
- The Army Sustainable Range Program 30 August 2005
- Department of the Army Pamphlet 385-63, Range Safety
- Fort Sill Memo 190-13: Army Physical Security Program
- Fort Sill Regulation 385-1, Post Range Regulation
- Fort Sill Regulation 385-10, Safety Regulation

### *6.2.2 Department of Defense Instructions*

- DoDI 6055 Series, DoD Safety and Occupational Program

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# 7. LIST OF CONTACTED AGENCIES, NATIVE AMERICAN TRIBES, AND GOVERNMENT OFFICIALS

## 7.1 FEDERAL AND STATE AGENCIES

### *7.1.1 Federal Agencies*

- Bureau of Indian Affairs, Southern Plains Regional Office
- U.S. Environmental Protection Agency
- U.S. Department of Agriculture
- U.S. Fish and Wildlife Service

### *7.1.2 State Agencies*

- Oklahoma Department of Environmental Quality
- Oklahoma Department of Wildlife Conservation
- Oklahoma State Historic Preservation Office
- Oklahoma Archaeological Survey
- Oklahoma Water Resources Board

## 7.2 NATIVE AMERICAN TRIBES

- Apache Tribe of Oklahoma
- Caddo Nation
- Cheyenne and Arapaho Tribes of Oklahoma
- Chickasaw Nation
- Comanche Nation of Oklahoma
- Delaware Nation
- Fort Sill Apache Tribe of Oklahoma
- Kiowa Tribe of Oklahoma
- Wichita and Affiliated Tribes

## 7.3 FEDERAL, STATE, AND LOCAL GOVERNMENT OFFICIALS

### *7.3.1 Federal Government Officials*

- Tom Cole, U.S. House of Representatives
- James Lankford, U.S. Senate
- Markwayne Mullin, U.S. Senate

### *7.3.2 State and Local Government Officials*

- Trey Caldwell, Oklahoma House of Representatives

- Rande Worthen, Oklahoma House of Representatives
- Daniel Pae, Oklahoma House of Representatives
- Chris Kidd, Oklahoma Senate
- Kevin Wallace, Oklahoma Senate
- Stan Booker, Mayor of Lawton
- J.J. Francais, Mayor of Elgin
- Michael Cleghorn, Lawton City Manager
- Wichita Mountain National Wildlife Refuge Manager
- Comanche County Commissioners, Districts 1, 2 and 3

# 8. LIST OF PREPARERS

| Government Agency Development Team | |
|---|---|
| **Name/Title** | **Role** |
| Fort Sill Environmental Quality Division<br>Richard McDaniel, NEPA Coordinator<br>Janet C-Murrain, Environmental Assistant<br>David Fritz, Support Branch Chief, EQD<br>Mike Spears, Fort Sill Range Officer | Environmental Planning/Lead EA Development |
| U.S. Army Corps of Engineers<br>Tulsa District<br>Lee Houston<br>Frank Roepke | Contract and Document Oversight |
| U.S. Army Environmental Command<br>Roger Paugh | Technical Review |
| Defense Centers for Public Health - Aberdeen<br>Kristy Broska | Operational Noise |

| Contractor Development Team | | | |
|---|---|---|---|
| **Name/Title** | **Project Role** | **Subject Area** | **Qualifications** |
| ***Jay Austin, Leidos***<br>Noise Analyst<br>M.S. Environmental Science<br>B.A. Biology | Section Author | Acoustic Environment | 18 years environmental science |
| ***Chris Crabtree, Leidos***<br>Air Quality Meteorologist<br>B.A. Environmental Studies | Section Author | Air Quality | 29 years environmental science |
| ***Tom Daues, PMP, Leidos***<br>Biologist<br>M.S. Natural Resources<br>B.S. Biology | Project Manager, Editor | Cumulative Impacts | 30 years environmental science |
| ***Jennifer Wallin, Leidos***<br>Environmental Scientist<br>M.S. Environmental Toxicology<br>B.S. Biology | Document Production | Document Production | 23 years environmental science; document production |
| ***Heather Stepp, Leidos***<br>Environmental Scientist<br>B.S. Environmental Engineering Technology | Document Production | Document Production | 26 years environmental science; document production |
| ***Heather Gordon, Leidos***<br>GIS Specialist<br>M.S. Geography<br>B.A. Environmental Studies | Figures | Geographic Information System (GIS) | 22 years environmental science; GIS applications |
| ***Nathan Gross, CHMM, Leidos***<br>Environmental Scientist<br>B.S. Wildlife and Fisheries Management | Section Author | Hazardous Materials and Waste, Land Use | 19 years environmental science |
| ***Brian Tutterow, Leidos***<br>Environmental Scientist<br>B.S. Biology | Section Author | Cultural Resources, Biological Resources, Noise | 25 years environmental science |
| ***Paul Rollinson, XCEL***<br>Senior Environmental Engineer<br>M.A. Applied Science | Section Author | Air Quality | 34 years environmental science |

| Contractor Development Team | | | |
|---|---|---|---|
| **Name/Title** | **Project Role** | **Subject Area** | **Qualifications** |
| ***Jason Sweet, Juniper***<br>Biologist<br>M.A. Geography<br>B.S. Wildlife Biology | Section Reviewer | Biological Resources | 16 years environmental science |
| ***Michael Mahr, Juniper***<br>Wildlife Biologist<br>M.S. Ecology | Section Author | Biological Resources | 7 years environmental science |
| ***Jessica Householder, Juniper***<br>Ecologist<br>B.S. Biological Sciences | Section Author | Biological Resources | 5 years environmental science |
| ***Olivia West, GEO Consultants***<br>Senior Environmental Engineer<br>PE Environmental Engineer<br>PhD Civil Engineering<br>MS Civil Engineering<br>BS Civil Engineering | Section Author | Water Resources | 30 years environmental science and engineering |

# Appendix A

# Correspondence and Outreach

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# A.1 Letter to the Oklahoma State Historic Preservation Officer

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL
462 HAMILTON ROAD, SUITE 120
FORT SILL, OKLAHOMA 73503

NOV 8 2022

SUBJECT: Environmental Assessment (EA) for the Fort Sill Maneuver Short Range Air Defense Battalion

CERTIFIED MAIL: 7021 2720 0001 0469 8120

Mr. Trait Thompson
State Historic Preservation Officer
Oklahoma History Center
800 Nazih Zuhdi Drive
Oklahoma City, OK 73105-7917

Dear Mr. Thompson:

The U.S. Army Garrison Fort Sill is preparing an Environmental Assessment (EA) to evaluate the potential impacts associated with stationing the Maneuver-Short Range Air Defense (M-SHORAD) Battalion (Bn) at Fort Sill, Oklahoma. This letter requests agency comment to assist in the development of the EA. In addition, the project meets the definition of an undertaking per 36 CFR 800.3(a) and is subject to review under the National Historic Preservation Act (NHPA: 54 U.S.C. § 300101 et seq.).

The proposed action includes four primary elements: (1) the stationing of approximately 550 Soldiers and associated dependents to Fort Sill; (2) the stationing of M-SHORAD vehicles and equipment; (3) the utilization of buildings and facilities on Fort Sill; and (4) M-SHORAD maneuver and training requirements for Fort Sill.

**M-SHORAD Personnel Requirements.** Stationing the M-SHORAD Bn at Fort Sill would result in an increase of approximately 550 Soldiers. An additional 20 contractor support personnel are anticipated to support the M-SHORAD system. Approximately 760 dependents would accompany the active-duty Soldiers to the Fort Sill area.

**M-SHORAD Vehicles and Equipment.** Stationing the M-SHORAD Bn would require a variety of different vehicles and equipment to be located at Fort Sill. The M-SHORAD system integrates existing guns and sensors onto a Stryker A1 combat vehicle. Up to 40 Stryker A1 combat vehicles equipped as M SHORAD systems would be stationed at Fort Sill as part of this action. In support of the 40 M-SHORAD system vehicles, an additional 20 Stryker A1 combat vehicles equipped as Infantry Carrier Vehicles (ICV) for platoon leaders and Medical Evacuation (MEDEVAC) vehicles would also be stationed at Fort Sill. The MaxxPro Mine Resistant Ambush Protected (MRAP) vehicle could be substituted for some or all of the additional 20 Stryker A1 combat vehicles. The battalion would include approximately 100 Joint Light Tactical Vehicles (JLTVs) and approximately 150 support vehicles such as pickup trucks, other vehicles

and trailers. The M-SHORAD Bn could also include the High-Mobility Multipurpose Wheeled Vehicles (HMMWVs) instead of the JLTVs, depending on procurement timelines and priorities. A variety of individual weapons, sensors and communications equipment would also be included.

**M-SHORAD Buildings and Facilities.** Implementation of the M-SHORAD Bn stationing at Fort Sill would require administration buildings for headquarters facilities and offices, buildings for vehicle maintenance equipment and material storage, secure parking areas for vehicles and equipment and buildings for barracks. For the purposes of analysis in this EA, the M-SHORAD Bn stationing at Fort Sill would utilize existing facilities and not require the construction of any new buildings. It is possible that additional facility modifications would occur in the future. The detailed requirements for these facilities are not known at this time. Once these requirements are known, additional NEPA analysis would be required. Table 1 identifies the facility requirements for the M-SHORAD Bn and identifies facilities at Fort Sill that would accommodate those requirements.

**Table 1. Facility Requirements M-SHORAD**

| Requirement | Fort Sill Facility |
|---|---|
| Battalion HQ Facility | Building 3415 |
| Maintenance Company HQ | Building 3203 |
| Four Battery HQs | Building 3203 |
| Hazardous Material Storage Facility | Building 2454 |
| Barracks (approximately 182 unaccompanied personnel) | Buildings 3427, 3428, 3429 |
| Tactical Equipment Maintenance Facility | Building 2454 |

HQ = Headquarters; M-SHORAD = Maneuver-Short Range Air Defense

**M-SHORAD Maneuver and Training**. Implementation of the M-SHORAD Bn stationing action would also involve maneuver training and the use of existing ranges on Fort Sill. The M-SHORAD Bn maneuver and training requirements can be met in existing Training Areas (TAs) on Fort Sill. These could include the following TAs: TAs 1-10 with limited use in 4 and 7 because of their locations and TAs 11, 15, 16, 18, 19, 20, 22-29, 32-38, and 57-59 (Figure 1). All training would occur on existing roads and trails.

The M-SHORAD weapon system primarily consists of a mounted 360-degree air defense turret capable of using Stinger missiles, a 30-millimeter (mm) cannon, and a 7.62 mm machine gun (U.S. Army 2021). The M-SHORAD is designed to support maneuver forces with "shoot-on-the-move" capability requiring maneuvering across multiple TAs on existing roads and maneuver trails, setting up temporary firing positions during halts and continuing to various objectives. Fort Still would continue to use the procedures outlined in the Installation Cultural Resources Management Plan to minimize impacts to cultural resources at Fort Sill.

In consideration of 36 CFR 800.3(a)(1), it is Fort Sill's determination that the stationing of the M-SHORAD mission at Fort Sill as described above does not have the potential to cause effects to historic properties. This determination was arrived at because there is no new construction or land disturbance planned as part of this action and only existing roads, trails and ranges would be used for maneuver and weapons training.

Fort Sill is informing your office of its determination of no potential to cause effects in response to the determination that the action is an undertaking subject to consultation pursuant to the NHPA. If you concur with the determination of no potential to cause effects, please provide written correspondence identifying your concurrence. If you do not concur with Fort Sill's determination of no potential to cause effects, please provide written correspondence that identifies the ways in which this undertaking has the potential to cause effects to historic properties and Fort Sill will continue its Section 106 consultation process accordingly.

Mr. David Fritz, Environmental Support Branch, has been designated as Fort Sill's official representative for all matters associated with this undertaking. He can be reached via telephone at (580) 442-3274. All written correspondence should be directed to the following address: Directorate of Public Works, Environmental Quality Division, Attn: AMIM-SIP-E (D. Fritz), 2515 Ringgold Road, Fort Sill, OK 73503.

If comments are not received from your office within 30 days of receipt of this letter, it will be assumed you concur with the determination of no potential to cause effects.

As always, Fort Sill looks forward to working with your office on the preservation of our cultural heritage.

Sincerely,

James H. B. Peay IV
Colonel, U.S. Army
Commanding

Enclosure
Figure 1 Training Areas and Ranges Proposed for Use on Fort Sill

## A.2 Letter from the Oklahoma State Historic Preservation Officer

**Oklahoma Historical Society** *Founded May 27, 1893*
**State Historic Preservation Office**
Oklahoma History Center • 800 Nazih Zuhdi Drive • Oklahoma City, OK 73105-7917
(405) 521-6249 • Fax (405) 522-0816 • www.okhistory.org/shpo/shpom.htm

December 1, 2022

Mr. David Fritz, Chief
Environmental Support Branch
DPW-EQD ATTN: AMIM-SIP-E (D. Fritz)
2515 Ringgold Road
Fort Sill, OK 73503

RE: File #0331-23; Fort Sill Proposed EA for the Fort Sill Maneuver Short Range Air Defense Battalion Project, Fort Sill, Comanche County, Oklahoma

Dear Mr. Fritz:

We have received and reviewed the materials for the referenced undertaking submitted with your letter dated November 8, 2022.

Based on the information you have provided we concur with your opinion that the undertaking will have no effect on historic properties.

Thank you for the opportunity to review this project. If you have any questions, please call Kristina Wyckoff, Historical Archaeologist, at 405-521-6381. Please reference the above underlined file number when responding. Thank you.

Sincerely,

Lynda Ozan
Deputy State Historic
Preservation Officer

LO:pm

DEC 08 2022

## A.3 Letter to the Oklahoma State Archaeologist

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL
462 HAMILTON ROAD, SUITE 120
FORT SILL, OKLAHOMA 73503

NOV 8 2022

SUBJECT: Environmental Assessment (EA) for the Fort Sill Maneuver Short Range Air Defense Battalion

CERTIFIED MAIL: 7021 2720 0001 0469 8137

Dr. Kary Stackelbeck
Oklahoma State Archeologist
Oklahoma Archeological Survey
111 E. Chesapeake
Norman, OK 73019-0575

Dear Dr. Stackelbeck:

The U.S. Army Garrison Fort Sill is preparing an Environmental Assessment (EA) to evaluate the potential impacts associated with stationing the Maneuver-Short Range Air Defense (M-SHORAD) Battalion (Bn) at Fort Sill, Oklahoma. This letter requests agency comment to assist in the development of the EA. In addition, the project meets the definition of an undertaking per 36 CFR 800.3(a) and is subject to review under the National Historic Preservation Act (NHPA: 54 U.S.C. § 300101 et seq.).

The proposed action includes four primary elements: (1) the stationing of approximately 550 Soldiers and associated dependents to Fort Sill; (2) the stationing of M-SHORAD vehicles and equipment; (3) the utilization of buildings and facilities on Fort Sill; and (4) M-SHORAD maneuver and training requirements for Fort Sill.

**M-SHORAD Personnel Requirements.** Stationing the M-SHORAD Bn at Fort Sill would result in an increase of approximately 550 Soldiers. An additional 20 contractor support personnel are anticipated to support the M-SHORAD system. Approximately 760 dependents would accompany the active-duty Soldiers to the Fort Sill area.

**M-SHORAD Vehicles and Equipment.** Stationing the M-SHORAD Bn would require a variety of different vehicles and equipment to be located at Fort Sill. The M-SHORAD system integrates existing guns and sensors onto a Stryker A1 combat vehicle. Up to 40 Stryker A1 combat vehicles equipped as M SHORAD systems would be stationed at Fort Sill as part of this action. In support of the 40 M-SHORAD system vehicles, an additional 20 Stryker A1 combat vehicles equipped as Infantry Carrier Vehicles (ICV) for platoon leaders and Medical Evacuation (MEDEVAC) vehicles would also be stationed at Fort Sill. The MaxxPro Mine Resistant Ambush Protected (MRAP) vehicle could be substituted for some or all of the additional 20 Stryker A1 combat vehicles. The battalion would include approximately 100 Joint Light Tactical Vehicles (JLTVs) and approximately 150 support vehicles such as pickup trucks, other vehicles

and trailers. The M-SHORAD Bn could also include the High-Mobility Multipurpose Wheeled Vehicles (HMMWVs) instead of the JLTVs, depending on procurement timelines and priorities. A variety of individual weapons, sensors and communications equipment would also be included.

**M-SHORAD Buildings and Facilities.** Implementation of the M-SHORAD Bn stationing at Fort Sill would require administration buildings for headquarters facilities and offices, buildings for vehicle maintenance equipment and material storage, secure parking areas for vehicles and equipment and buildings for barracks. For the purposes of analysis in this EA, the M-SHORAD Bn stationing at Fort Sill would utilize existing facilities and not require the construction of any new buildings. It is possible that additional facility modifications would occur in the future. The detailed requirements for these facilities are not known at this time. Once these requirements are known, additional NEPA analysis would be required. Table 1 identifies the facility requirements for the M-SHORAD Bn and identifies facilities at Fort Sill that would accommodate those requirements.

**Table 1. Facility Requirements M-SHORAD**

| Requirement | Fort Sill Facility |
|---|---|
| Battalion HQ Facility | Building 3415 |
| Maintenance Company HQ | Building 3203 |
| Four Battery HQs | Building 3203 |
| Hazardous Material Storage Facility | Building 2454 |
| Barracks (approximately 182 unaccompanied personnel) | Buildings 3427, 3428, 3429 |
| Tactical Equipment Maintenance Facility | Building 2454 |

HQ = Headquarters; M-SHORAD = Maneuver-Short Range Air Defense

**M-SHORAD Maneuver and Training**. Implementation of the M-SHORAD Bn stationing action would also involve maneuver training and the use of existing ranges on Fort Sill. The M-SHORAD Bn maneuver and training requirements can be met in existing Training Areas (TAs) on Fort Sill. These could include the following TAs: TAs 1-10 with limited use in 4 and 7 because of their locations and TAs 11, 15, 16, 18, 19, 20, 22-29, 32-38, and 57-59 (Figure 1). All training would occur on existing roads and trails.

The M-SHORAD weapon system primarily consists of a mounted 360-degree air defense turret capable of using Stinger missiles, a 30-millimeter (mm) cannon, and a 7.62 mm machine gun (U.S. Army 2021). The M-SHORAD is designed to support maneuver forces with "shoot-on-the-move" capability requiring maneuvering across multiple TAs on existing roads and maneuver trails, setting up temporary firing positions during halts and continuing to various objectives. Fort Still would continue to use the procedures outlined in the Installation Cultural Resources Management Plan to minimize impacts to cultural resources at Fort Sill.

In consideration of 36 CFR 800.3(a)(1), it is Fort Sill's determination that the stationing of the M-SHORAD mission at Fort Sill as described above does not have the potential to cause effects to historic properties. This determination was arrived at because there is no new construction or land disturbance planned as part of this action and only existing roads, trails and ranges would be used for maneuver and weapons training.

Fort Sill is informing your office of its determination of no potential to cause effects in response to the determination that the action is an undertaking subject to consultation pursuant to the NHPA. If you concur with the determination of no potential to cause effects, please provide written correspondence identifying your concurrence. If you do not concur with Fort Sill's determination of no potential to cause effects, please provide written correspondence that identifies the ways in which this undertaking has the potential to cause effects to historic properties and Fort Sill will continue its Section 106 consultation process accordingly.

Mr. David Fritz, Environmental Support Branch, has been designated as Fort Sill's official representative for all matters associated with this undertaking. He can be reached via telephone at (580) 442-3274. All written correspondence should be directed to the following address: Directorate of Public Works, Environmental Quality Division, Attn: AMIM-SIP-E (D. Fritz), 2515 Ringgold Road, Fort Sill, OK 73503.

If comments are not received from your office within 30 days of receipt of this letter, it will be assumed you concur with the determination of no potential to cause effects.

As always, Fort Sill looks forward to working with your office on the preservation of our cultural heritage.

Sincerely,

James H. B. Peay IV
Colonel, U.S. Army
Commanding

Enclosure
Figure 1 Training Areas and Ranges Proposed for Use on Fort Sill

## A.4 Letter from the Oklahoma State Archaeologist

Oklahoma Archeological Survey

THE UNIVERSITY OF OKLAHOMA

November 21, 2022

Directorate of Public Works
Environmental Quality Division
Attn: AMIM-SIP-E (D. Fritz)
2515 Ringgold Road
Fort Sill, Oklahoma 73503

Re: OAS FY23-0293 Fort Sill Proposes Maneuver-Short Range Air Defense M-SHORAD Battalion (Bn) at Fort Sill, Comanche County, Oklahoma.

Dear Directorate:

The Community Assistance Program staff of the Oklahoma Archeological Survey has reviewed the above referenced project to identify areas that may potentially contain prehistoric or historic archeological materials (historic properties). The location of your project has been crosschecked with the state site files containing approximately 26,000 archaeological sites, which are currently recorded for the state of Oklahoma. No Sites are listed as occurring within your project area, and based on the topographic and hydrologic setting, no archaeological materials are likely to be encountered. Thus, an archaeological field inspection is not considered necessary. Please contact this office at (405) 325-7211 if buried archaeological materials such as chipped stone tools, pottery, bone, historic crockery, glass, metal items or building materials are exposed during construction activities.

This environmental review and evaluation are done in cooperation with the State Historic Preservation Office, Oklahoma Historical Society. The responsible federal agency or their official delegate must also have a letter from that office to document consultation pursuant to Section 106 of the National Historic Preservation Act.

In addition to our review comments, under 36CFR Part 800.3 you are reminded of your responsibility to consult with the appropriate Native American tribe/groups to identify any concerns they may have pertaining to this undertaking and potential impacts to properties of traditional and/or ceremonial value.

Sincerely,

Daniel Lestarjette
Staff Archaeologist

Kary L. Stackelbeck, Ph.D.
State Archaeologist

: dkg
cc: SHPO

Rcvd
NOV 29 2022

111 Chesapeake, Room 102, Norman, Oklahoma 73019-5111 PHONE: (405) 325-7211 FAX: (405) 325-7604
A UNIT OF ARTS AND SCIENCES SERVING THE PEOPLE OF OKLAHOMA

## A.5 Representative Tribal Letter

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL
462 HAMILTON ROAD, SUITE 120
FORT SILL, OKLAHOMA 73503

NOV 8 2022

SUBJECT: Environmental Assessment (EA) for the Fort Sill Maneuver Short Range Air Defense Battalion

CERTIFIED MAIL: 7021 2720 0001 0469 8144

Apache Tribe of Oklahoma
Chairman Durrell Cooper
PO Box 1330
Anadarko, OK 73005

Dear Chairman Cooper:

The U.S. Army Garrison Fort Sill is preparing an Environmental Assessment (EA) to evaluate the potential impacts associated with stationing the Maneuver-Short Range Air Defense (M-SHORAD) Battalion (Bn) at Fort Sill, Oklahoma. This letter requests agency comment to assist in the development of the EA. In addition, the project meets the definition of an undertaking per 36 CFR 800.3(a) and is subject to review under the National Historic Preservation Act (NHPA: 54 U.S.C. § 300101 et seq.).

The proposed action includes four primary elements: (1) the stationing of approximately 550 Soldiers and associated dependents to Fort Sill; (2) the stationing of M-SHORAD vehicles and equipment; (3) the utilization of buildings and facilities on Fort Sill; and (4) M-SHORAD maneuver and training requirements for Fort Sill.

**M-SHORAD Personnel Requirements.** Stationing the M-SHORAD Bn at Fort Sill would result in an increase of approximately 550 Soldiers. An additional 20 contractor support personnel are anticipated to support the M-SHORAD system. Approximately 760 dependents would accompany the active-duty Soldiers to the Fort Sill area.

**M-SHORAD Vehicles and Equipment.** Stationing the M-SHORAD Bn would require a variety of different vehicles and equipment to be located at Fort Sill. The M-SHORAD system integrates existing guns and sensors onto a Stryker A1 combat vehicle. Up to 40 Stryker A1 combat vehicles equipped as M SHORAD systems would be stationed at Fort Sill as part of this action. In support of the 40 M-SHORAD system vehicles, an additional 20 Stryker A1 combat vehicles equipped as Infantry Carrier Vehicles (ICV) for platoon leaders and Medical Evacuation (MEDEVAC) vehicles would also be stationed at Fort Sill. The MaxxPro Mine Resistant Ambush Protected (MRAP) vehicle could be substituted for some or all of the additional 20 Stryker A1 combat vehicles. The battalion would include approximately 100 Joint Light Tactical Vehicles (JLTVs) and approximately 150 support vehicles such as pickup trucks, other vehicles and trailers. The M-SHORAD Bn could also include the High-Mobility Multipurpose

Wheeled Vehicles (HMMWVs) instead of the JLTVs, depending on procurement timelines and priorities. A variety of individual weapons, sensors and communications equipment would also be included.

**M-SHORAD Buildings and Facilities.** Implementation of the M-SHORAD Bn stationing at Fort Sill would require administration buildings for headquarters facilities and offices, buildings for vehicle maintenance equipment and material storage, secure parking areas for vehicles and equipment and buildings for barracks. For the purposes of analysis in this EA, the M-SHORAD Bn stationing at Fort Sill would utilize existing facilities and not require the construction of any new buildings. It is possible that additional facility modifications would occur in the future. The detailed requirements for these facilities are not known at this time. Once these requirements are known, additional NEPA analysis would be required. Table 1 identifies the facility requirements for the M-SHORAD Bn and identifies facilities at Fort Sill that would accommodate those requirements.

**Table 1. Facility Requirements M-SHORAD**

| Requirement | Fort Sill Facility |
|---|---|
| Battalion HQ Facility | Building 3415 |
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| Barracks (approximately 182 unaccompanied personnel) | Buildings 3427, 3428, 3429 |
| Tactical Equipment Maintenance Facility | Building 2454 |

HQ = Headquarters; M-SHORAD = Maneuver-Short Range Air Defense

**M-SHORAD Maneuver and Training**. Implementation of the M-SHORAD Bn stationing action would also involve maneuver training and the use of existing ranges on Fort Sill. The M-SHORAD Bn maneuver and training requirements can be met in existing Training Areas (TAs) on Fort Sill. These could include the following TAs: TAs 1-10 with limited use in 4 and 7 because of their locations and TAs 11, 15, 16, 18, 19, 20, 22-29, 32-38, and 57-59 (Figure 1). All training would occur on existing roads and trails.

The M-SHORAD weapon system primarily consists of a mounted 360-degree air defense turret capable of using Stinger missiles, a 30-millimeter (mm) cannon, and a 7.62 mm machine gun (U.S. Army 2021). The M-SHORAD is designed to support maneuver forces with "shoot-on-the-move" capability requiring maneuvering across multiple TAs on existing roads and maneuver trails, setting up temporary firing positions during halts and continuing to various objectives. Fort Still would continue to use the procedures outlined in the Installation Cultural Resources Management Plan to minimize impacts to cultural resources at Fort Sill.

In consideration of 36 CFR 800.3(a)(1), it is Fort Sill's determination that the stationing of the M-SHORAD mission at Fort Sill as described above does not have the potential to cause effects to historic properties. This determination was arrived at because there is no new construction or land disturbance planned as part of this action and only existing roads, trails and ranges would be used for maneuver and weapons training.

Fort Sill is informing your office of its determination of no potential to cause effects in response to the determination that the action is an undertaking subject to consultation pursuant to the NHPA. If you concur with the determination of no potential to cause effects, please provide written correspondence identifying your concurrence. If you do not concur with Fort Sill's determination of no potential to cause effects, please provide written correspondence that identifies the ways in which this undertaking has the potential to cause effects to historic properties and Fort Sill will continue its Section 106 consultation process accordingly.

Mr. David Fritz, Environmental Support Branch, has been designated as Fort Sill's official representative for all matters associated with this undertaking. He can be reached via telephone at (580) 442-3274. All written correspondence should be directed to the following address: Directorate of Public Works, Environmental Quality Division, Attn: AMIM-SIP-E (D. Fritz), 2515 Ringgold Road, Fort Sill, OK 73503.

If comments are not received from your office within 30 days of receipt of this letter, it will be assumed you concur with the determination of no potential to cause effects.

If you have not contacted us to set up a consultation meeting or written comments are not received from your office within thirty days of receipt of this letter, we will continue the Section 106 process with the understanding that the Apache Tribe of Oklahoma has no properties of religious or cultural significance within the areas affected and no concerns with the undertaking's potential effects to historic properties.

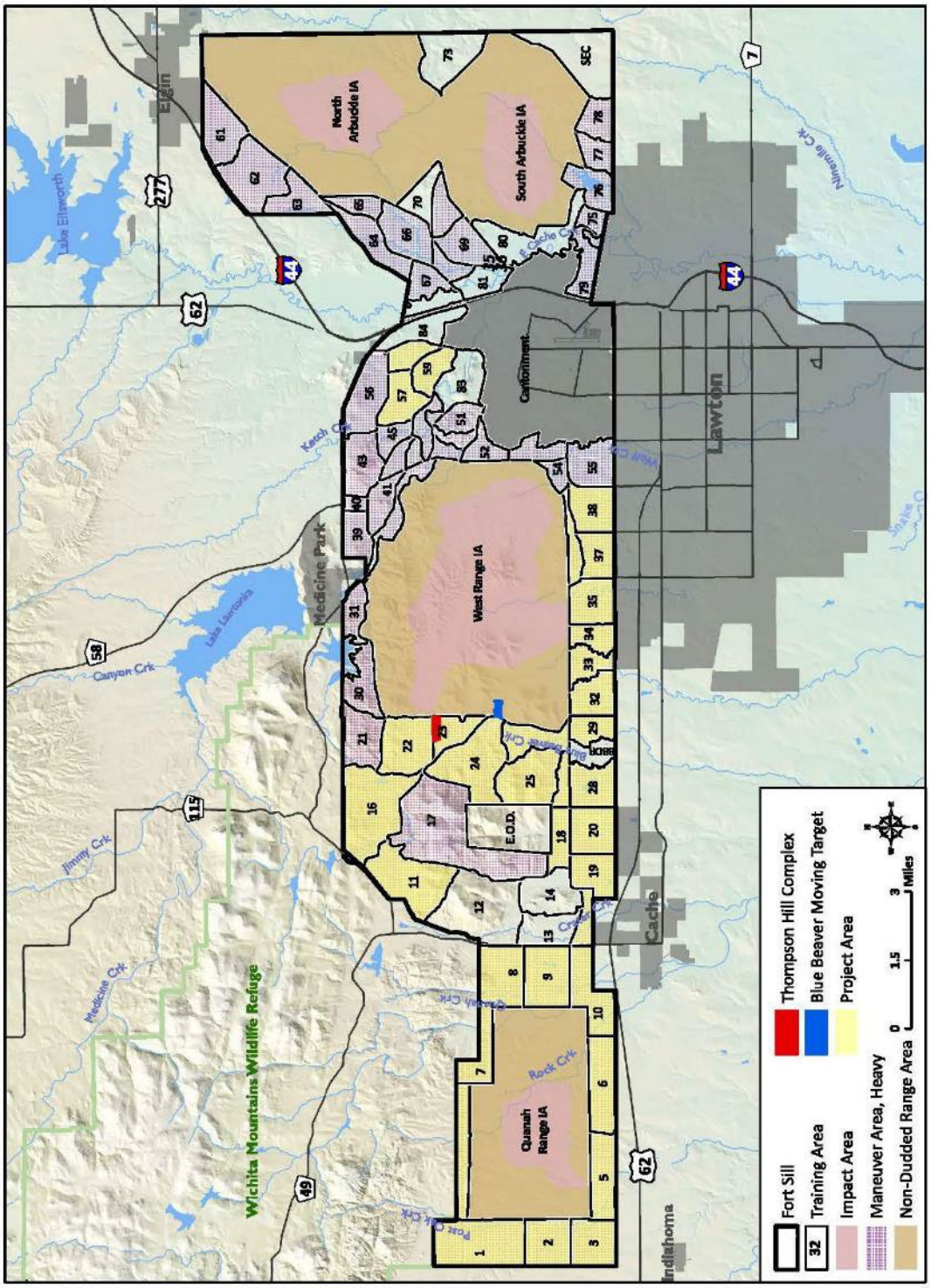
As always, Fort Sill looks forward to working with your office on the preservation of our cultural heritage.

Sincerely,

James H. B. Peay IV
Colonel, U.S. Army
Commanding

Enclosure
Figure 1 Training Areas and Ranges Proposed for Use on Fort Sill

Enclosure


Training Areas and Ranges Proposed for Use on Fort Sill
Fort Sill
Training Area
Impact Area
Maneuver Area, Heavy
Non-Dudded Range Area
Thompson Hill Complex
Blue Beaver Moving Target
Project Area
Miles
North Arbuckle IA
South Arbuckle IA
West Range IA
Quanah Range IA
E.O.D.
Cantonment
Lawton
Elgin
Cache
Medicine Park
Wichita Mountains Wildlife Refuge
Lake Ellsworth
Lake Lawtonka
Canyon Crk
Jimmy Crk
Medicine Crk
Rock Crk
Indiahoma

## A.6 Letter from the Comanche Nation

COMANCHE NATION

Headquarters, United States Army Garrison, Fort Sill
Attn: Mr. Davy Fritz
462 Hamilton Road, Suite 120
Fort Sill, Oklahoma 73503

December 19, 2022

Re: Environmental Assessment (EA) for the Fort Sill
Maneuver-Short Range Air Defense Battalion

Dear Mr. Davy Fritz:

In response to your request, the above reference project has been reviewed by staff of this office to identify areas that may potentially contain prehistoric or historic archeological materials. The location of your project has been cross referenced with the Comanche Nation site files, where an indication of ***"No Properties"*** have been identified. (IAW 36 CFR 800.4(d)(1)).

Please contact this office at (580) 595-9960/9618) if you require additional information on this project.

This review is performed in order to identify and preserve the Comanche Nation and State cultural heritage, in conjunction with the State Historic Preservation Office.

Regards

Comanche Nation Historic Preservation Office
Theodore E. Villicana , Technician
#6 SW "D" Avenue, Suite C
Lawton, OK. 73502

COMANCHE NATION P.O. BOX 908 / LAWTON, OK 73502
PHONE: 580-492-4988 TOLL FREE:1-877-492-4988

# A.7 Representative Agency Letter

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT SILL
462 HAMILTON ROAD, SUITE 120
FORT SILL, OKLAHOMA 73503

NOV 8 2022

SUBJECT: Environmental Assessment (EA) for the Fort Sill Maneuver Short Range Air Defense Battalion

CERTIFIED MAIL: 7021 2720 0001 0469 8236

Mr. Samuel Coleman, P.E.
Acting Federal Region VI Administrator
U.S. Environmental Protection Agency
1445 Ross Ave. Suite 1200
Dallas, TX 75202

Dear Mr. Coleman:

The U.S. Army Garrison Fort Sill is preparing an Environmental Assessment (EA) to evaluate the potential impacts associated with stationing the Maneuver-Short Range Air Defense (M-SHORAD) Battalion (Bn) at Fort Sill, Oklahoma. This letter requests agency and public stakeholder comment to assist in the development of the EA.

The proposed action includes four primary elements: (1) the stationing of approximately 550 Soldiers and associated dependents to Fort Sill; (2) the stationing of M-SHORAD vehicles and equipment; (3) the utilization of buildings and facilities on Fort Sill; and (4) M-SHORAD maneuver and training requirements for Fort Sill.

At this early stage of the project Fort Sill is notifying the public and others of this project and requesting early scoping comments on this action. Project scoping is an opportunity to learn about and comment on the project and to identify issues of interest or concern to help frame the environmental analyses in the EA. Once the EA and Draft Finding of No Significant Impact (FONSI) have been prepared, Fort Sill will publish a notice of availability in the Lawton Constitution and copies of the EA and Draft FONSI will be available on the internet and in local libraries during the 30 day public review and comment period. Fort Sill encourages you to monitor public notices for more information and provide comments during scoping when the EA and Draft FONSI are released. Thank you for your input on this important project.

Mr. Richard McDaniel, NEPA Coordinator, Environmental Support Branch, has been designated as Fort Sill's official representative for all matters dealing with this undertaking. Please forward any comments to the Directorate of Public Works, Environmental Quality Division, Attn: Richard McDaniel, 2515 Ringgold Road, Fort Sill, OK 73503, or via email to: richard.a.mcdaniel49.civ@army.mil.

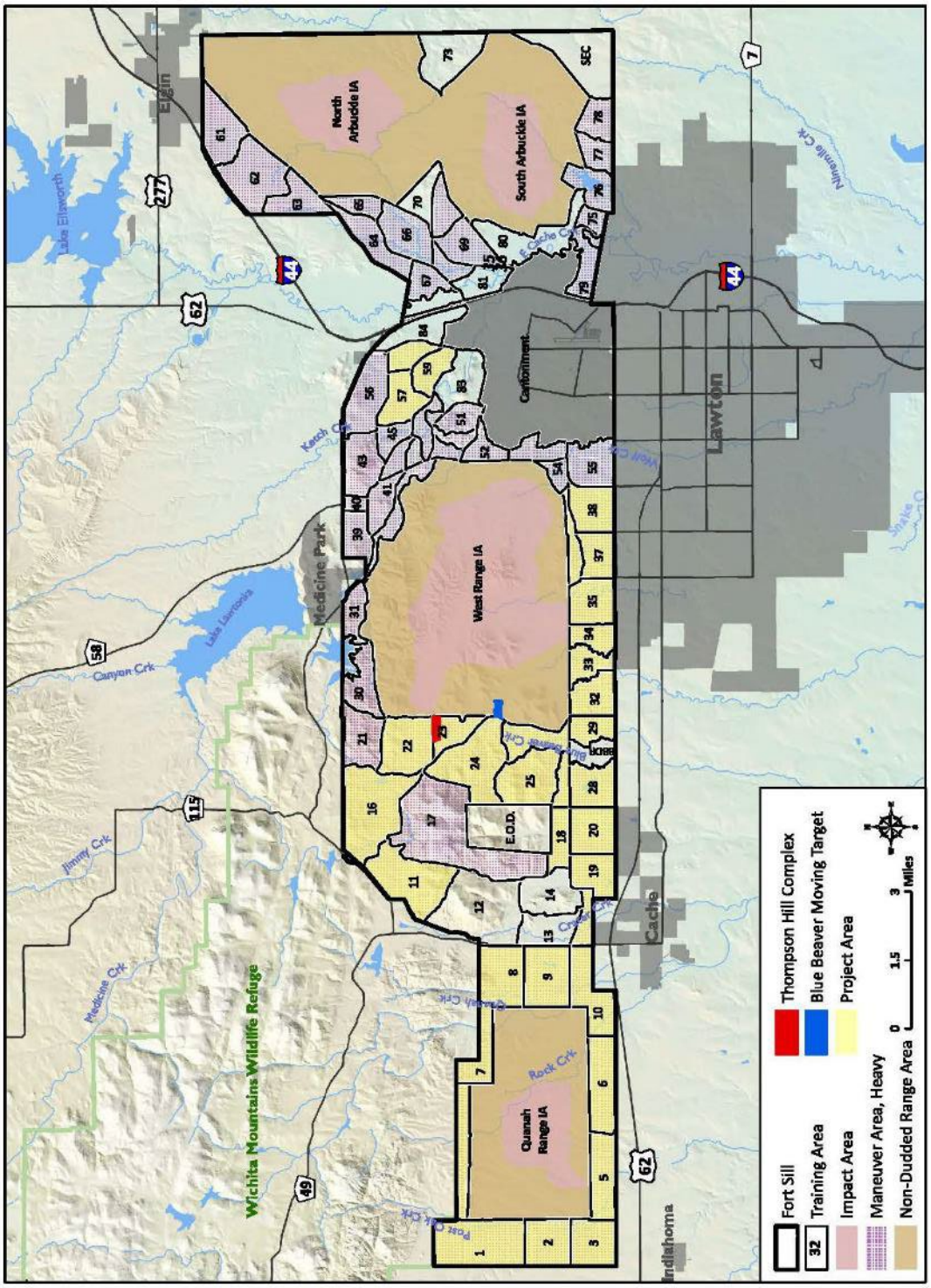
If you have any questions, please contact Mr. Richard McDaniel, NEPA Coordinator, by telephone at 580-442-5671 or at email above.

Sincerely,

James H. B. Peay IV
Colonel, U.S. Army
Commanding

Enclosure
Figure 1 Training Areas and Ranges Proposed for Use on Fort Sill

Enclosure


Training Areas and Ranges Proposed for Use on Fort Sill
Fort Sill
Training Area
Impact Area
Maneuver Area, Heavy
Non-Dudded Range Area
Thompson Hill Complex
Blue Beaver Moving Target
Project Area
Miles
North Arbuckle IA
South Arbuckle IA
West Range IA
Quanah Range IA
E.O.D.
Cantonment
Lawton
Elgin
Cache
Medicine Park
Wichita Mountains Wildlife Refuge
Lake Ellsworth
Lake Lawtonka
Canyon Crk
Jimmy Crk
Medicine Crk
Rock Crk
Keech Crk
Indiahoma

# Appendix B

# Representative Safety Danger Zones

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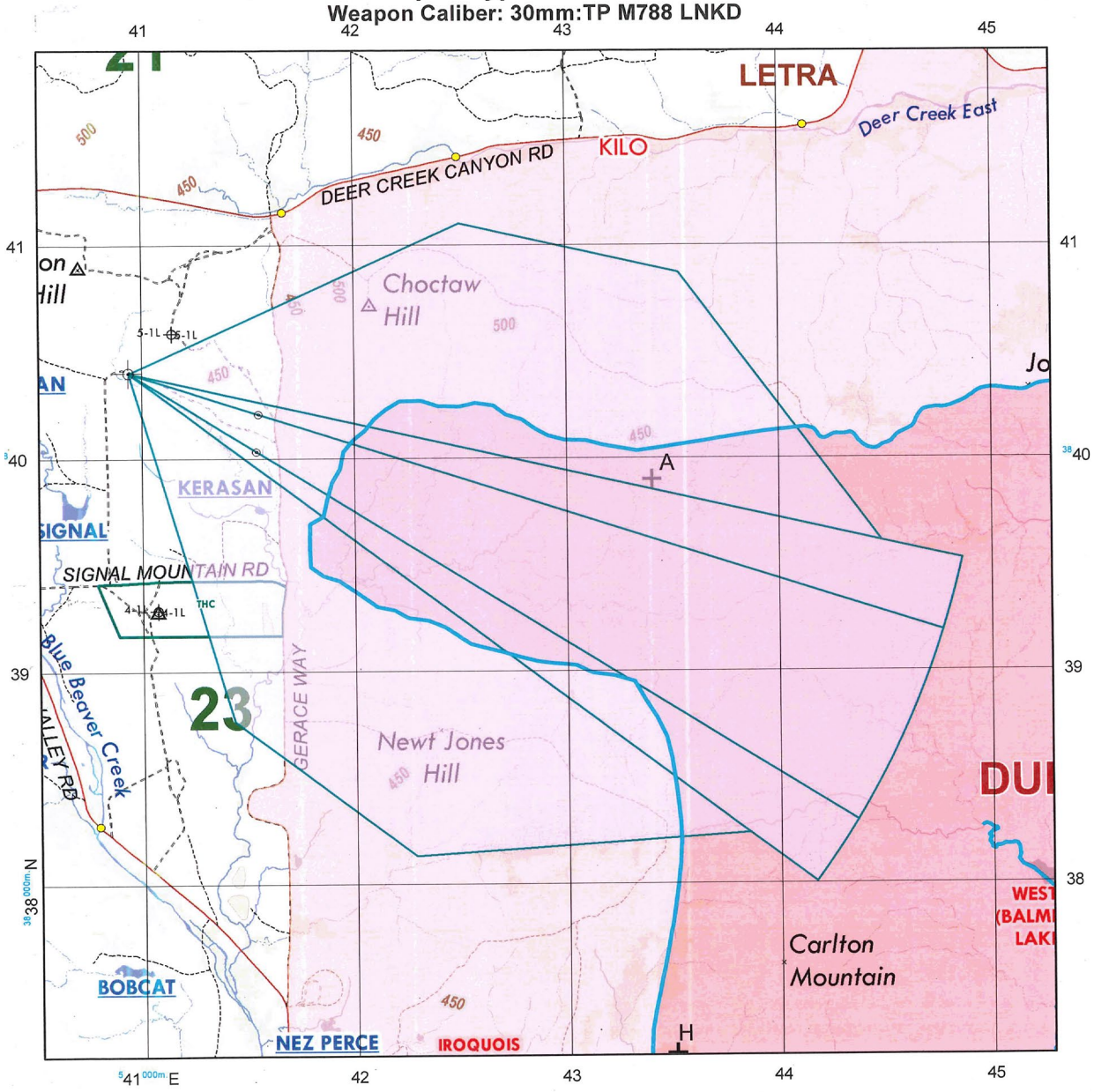
Map Scale: 1:25,000
Layout Date: 10/03/2022

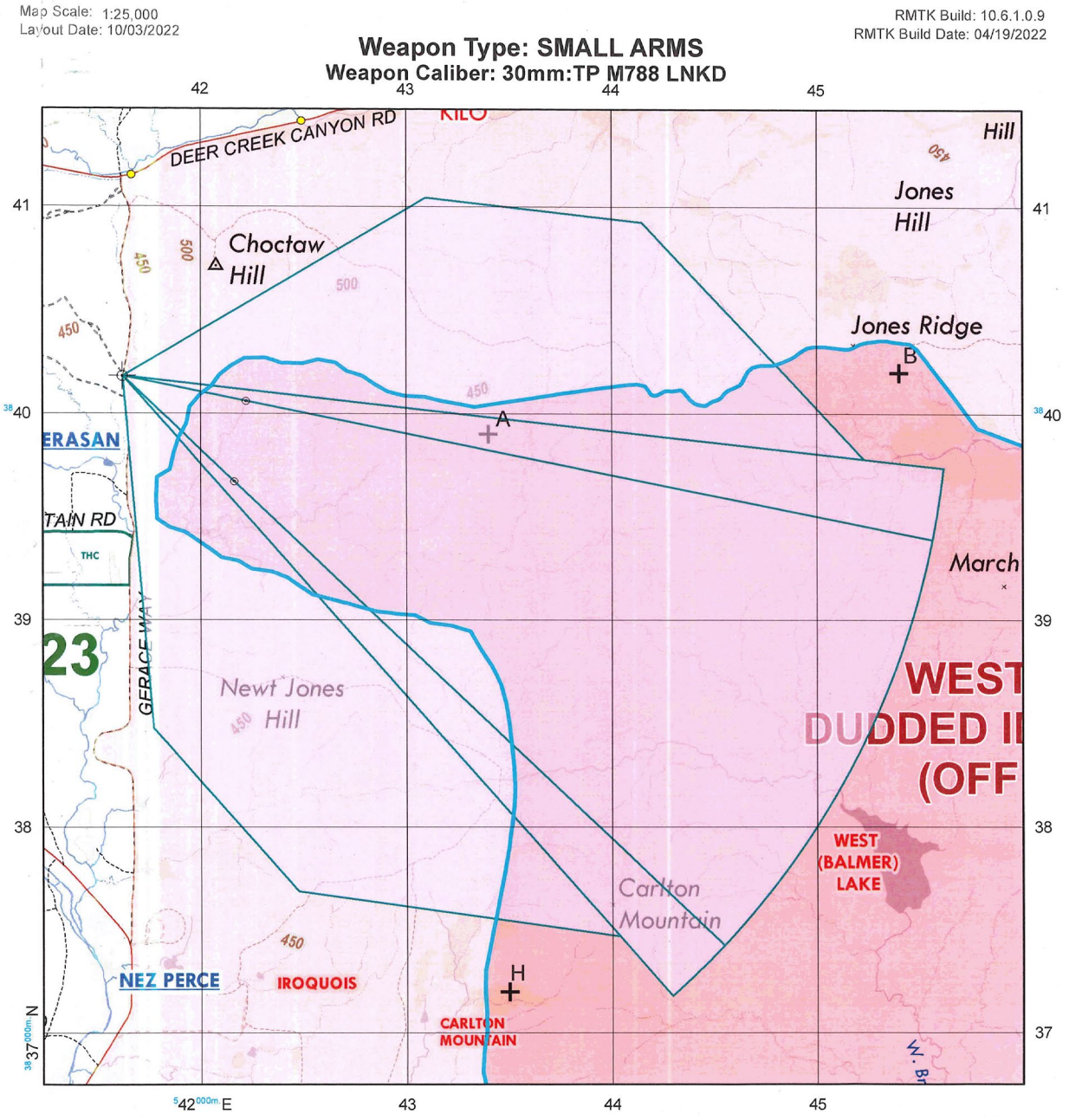
RMTK Build: 10.6.1.0.9
RMTK Build Date: 04/19/2022

**Weapon Type: SMALL ARMS**
**Weapon Caliber: 30mm:TP M788 LNKD**




| | | | |
|---|---|---|---|
| Range Manager Signature Authority: or Approving Authority: | Date: Date: 18 Oct 22 | Michael R. Spears, Range Officer | |
| SDZ Created By: Kevin L. Imel | Date: 10/03/2022 Unit: Range Ops | Phone: 580-442-5613 | Email: kevin.l.imel.civ@army.mil |

| | | | |
|---|---|---|---|
| SDZ Name: THC_30mm-M788_WRA<br>SDZ Type: Batwing<br>Installation: Fort Sill, Oklahoma<br>Range Name: THC<br>Range Officer: Michael R. Spears<br>Min Target Dist: 639.00 m<br>Max Target Dist: 702.00 m | Direct Fire<br>Ground/AerialTarget<br>Distance X: 4,020.00 m<br>Distance Y: 3,631.00 m<br>Distance W: 1,023.00 m<br>Dispersion Angle: 5.00 deg<br>Ricochet Angle: 5.00 deg | Angle P: 36.78 deg<br>Angle Q: 40.37 deg<br>Vertical Hazard: 524.00 m<br>Impact Media: Worst Case<br>Lt GTL Azi: 107.59 deg<br>Rt GTL Azi: 121.59 deg<br>FP: 14SND4093740402 | TP: 14SND4154740208<br>TP: 14SND4153640034 |

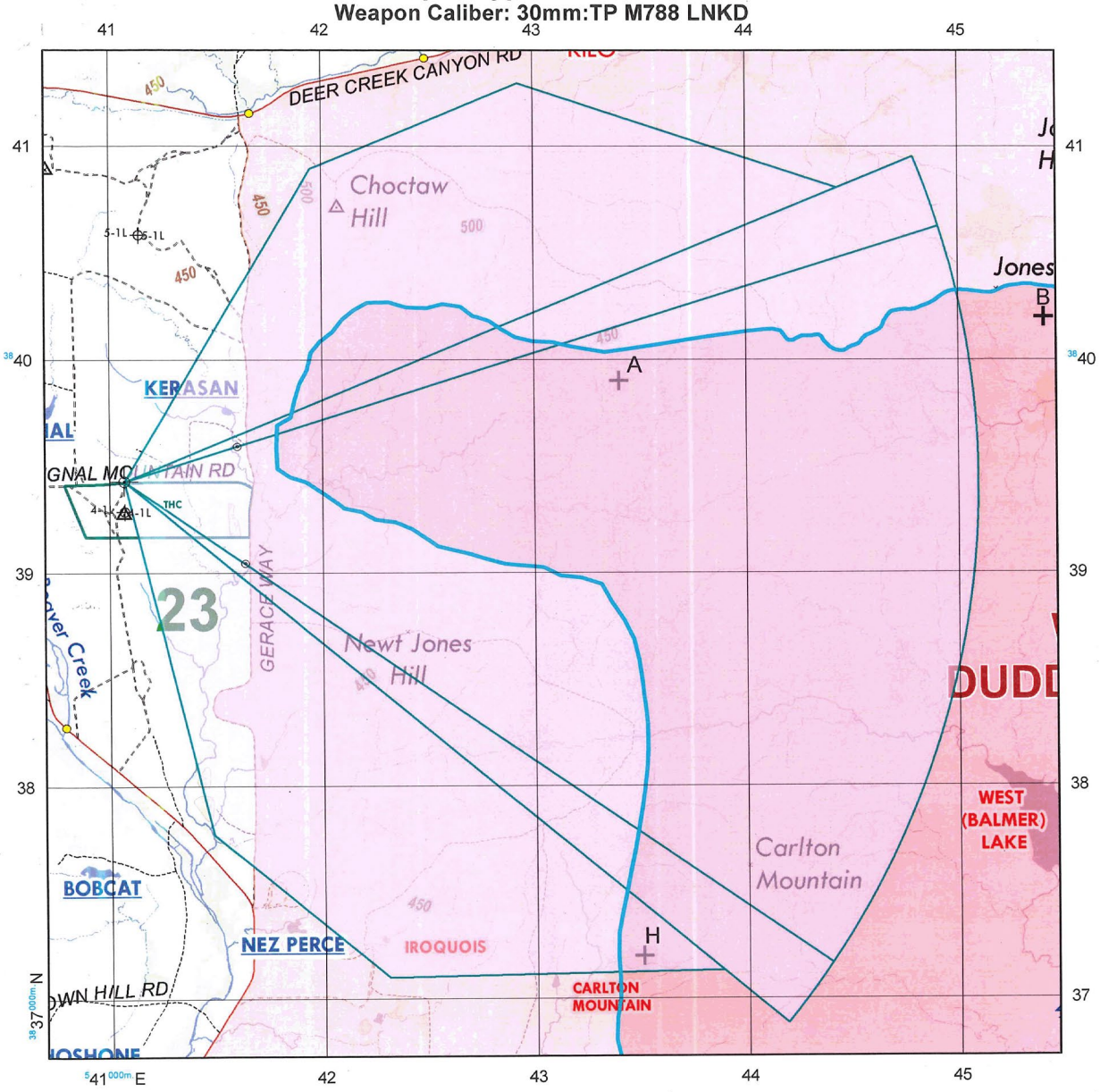



| | | | |
|---|---|---|---|
| Range Manager Signature Authority: or Approving Authority: | Date: Date: 18 Oct 22 | Michael R. Spears, Range Officer | |
| SDZ Created By: Kevin L. Imel | Date: 10/03/2022 Unit: Range Ops | Phone: 580-442-5613 | Email: kevin.l.imel.civ@army.mil |
| SDZ Name: THC_30mm-M788_WRA<br>SDZ Type: Batwing<br>Installation: Fort Sill, Oklahoma<br>Range Name: THC<br>Range Officer: Michael R. Spears<br>Min Target Dist: 611.00 m<br>Max Target Dist: 743.00 m | Direct Fire<br>Ground/Aerial Target<br>Distance X: 4,020.00 m<br>Distance Y: 3,631.00 m<br>Distance W: 1,023.00 m<br>Dispersion Angle: 5.00 deg<br>Ricochet Angle: 5.00 deg | Angle P: 36.78 deg<br>Angle Q: 40.37 deg<br>Vertical Hazard: 524.00 m<br>Impact Media: Worst Case<br>Lt GTL Azi: 101.35 deg<br>Rt GTL Azi: 133.29 deg<br>FP: 14SND4162040180 | TP: 14SND4221940060<br>TP: 14SND4216139670 |

Map Scale: 1:25,000
Layout Date: 10/03/2022

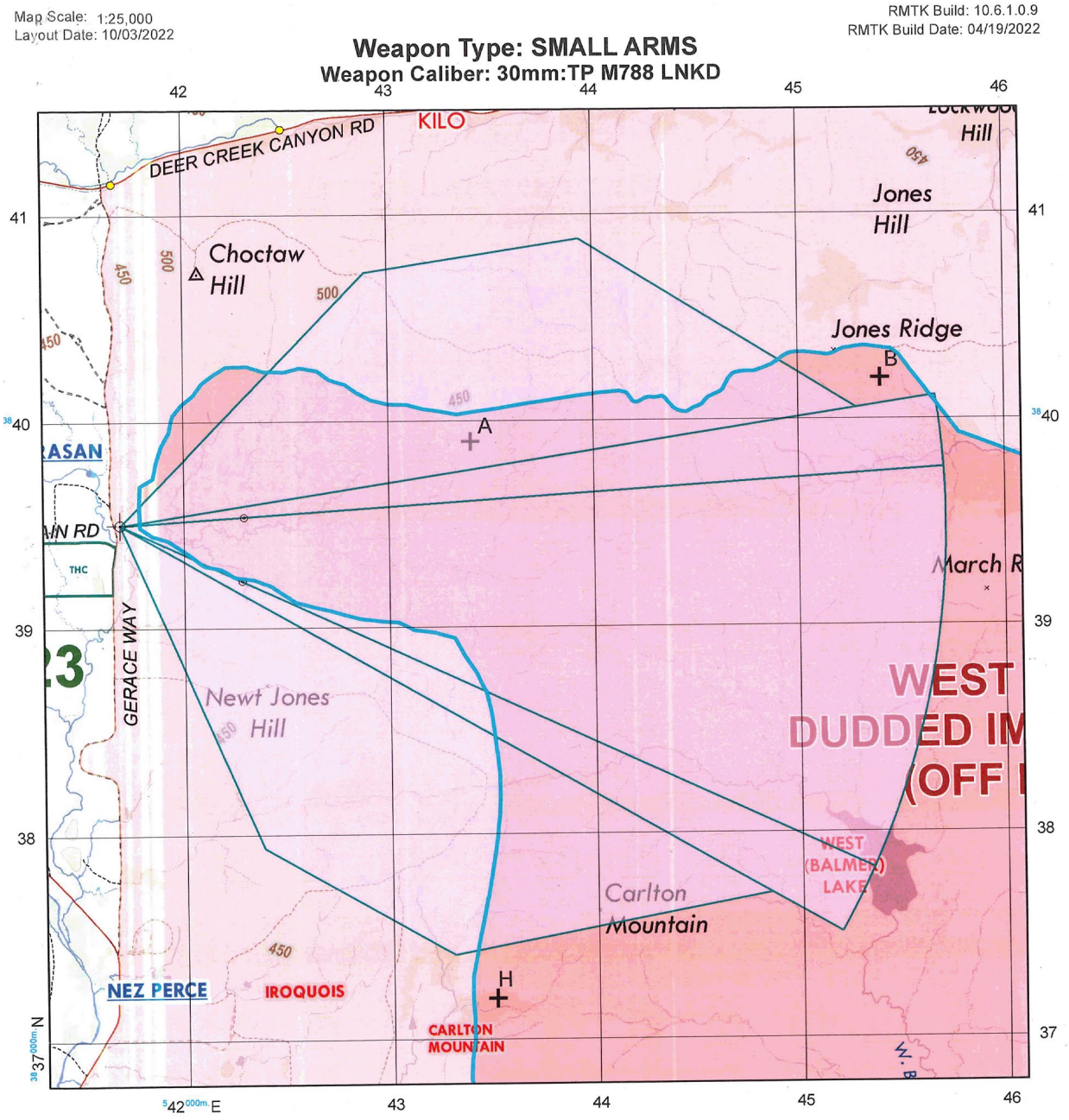
RMTK Build: 10.6.1.0.9
RMTK Build Date: 04/19/2022

**Weapon Type: SMALL ARMS**
**Weapon Caliber: 30mm:TP M788 LNKD**




| | | | |
|---|---|---|---|
| Range Manager Signature Authority or Approving Authority: | Date: 18 Oct 22 | Michael R. Spears, Range Officer | |
| SDZ Created By: Kevin L. Imel | Date: 10/03/2022 | Unit: Range Ops | Phone: 580-442-5613 | Email: kevin.l.imel.civ@army.mil |

| | | | |
|---|---|---|---|
| SDZ Name: THC_30mm-M788_WRA | Direct Fire | Angle P: 36.78 deg | TP: 14SND4159739593 |
| SDZ Type: Batwing | Ground/Aerial Target | Angle Q: 40.37 deg | TP: 14SND4163139044 |
| Installation: Fort Sill, Oklahoma | Distance X: 4,020.00 m | Vertical Hazard: 524.00 m | |
| Range Name: THC | Distance Y: 3,631.00 m | Impact Media: Worst Case | |
| Range Officer: Michael R. Spears | Distance W: 1,023.00 m | Lt GTL Azi: 72.68 deg | |
| Min Target Dist: 555.00 m | Dispersion Angle: 5.00 deg | Rt GTL Azi: 124.26 deg | |
| Max Target Dist: 682.00 m | Ricochet Angle: 5.00 deg | FP: 14SND4106739428 | |




| | | | |
|---|---|---|---|
| Range Manager Signature Authority or Approving Authority: | Date: Date: 18 Oct 22 | Michael R. Spears, Range Officer | |
| SDZ Created By: Kevin L. Imel | Date: 10/03/2022 | Unit: Range Ops | Phone: 580-442-5613 | Email: kevin.l.imel.civ@army.mil |

| | | | |
|---|---|---|---|
| SDZ Name: THC_30mm-M788_WRA<br>SDZ Type: Batwing<br>Installation: Fort Sill, Oklahoma<br>Range Name: THC<br>Range Officer: Michael R. Spears<br>Min Target Dist: 604.00 m<br>Max Target Dist: 650.00 m | Direct Fire<br>Ground/Aerial Target<br>Distance X: 4,020.00 m<br>Distance Y: 3,631.00 m<br>Distance W: 1,023.00 m<br>Dispersion Angle: 5.00 deg<br>Ricochet Angle: 5.00 deg | Angle P: 36.78 deg<br>Angle Q: 40.37 deg<br>Vertical Hazard: 524.00 m<br>Impact Media: Worst Case<br>Lt GTL Azi: 86.21 deg<br>Rt GTL Azi: 114.62 deg<br>FP: 14SND4169039500 | TP: 14SND4229239540<br>TP: 14SND4228139229 |

# Appendix C

# Air Quality

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# C.1 Air Conformity Applicable Model Report

## 1. General Information

**- Action Location**
**Base:** GENERIC BASE
**State:** Oklahoma
**County(s):** Comanche
**Regulatory Area(s):** NOT IN A REGULATORY AREA

**- Action Title:** Fort Sill M-SHORAD

**- Project Number/s (if applicable):** Not applicable

**- Projected Action Start Date:** 1 / 2024

**- Action Purpose and Need:**
Purpose is to improve the protection of tactical maneuver forces from current and future aerial threats at Fort Sill. There is a need to improve the Army's dedicated air defense capability in current maneuver formations to counter short-range aerial threats.

**- Action Description:**
Proposed Action - Station the Maneuver-Short Range Air Defense (M-SHORAD) Battalion (BN) at Fort Sill, Oklahoma

Alternative - Do not station the BN at Ft. Sill.

**- Point of Contact**
**Name:** Paul W. Rollinson
**Title:** Senior Consultant/Principal
**Organization:** XCEL Engineering, Inc.
**Email:** prollinson@xceleng.com
**Phone Number:** (865) 719-1750

**- Activity List:**

| | Activity Type | Activity Title |
|---|---|---|
| 2. | Personnel | Fort Sill M-SHORAD |

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

## 2. Personnel

### 2.1 General Information & Timeline Assumptions

**- Add or Remove Activity from Baseline?** Add

**- Activity Location**
**County:** Comanche
**Regulatory Area(s):** NOT IN A REGULATORY AREA

**- Activity Title:** Fort Sill M-SHORAD

**- Activity Description:**
Station the Maneuver-Short Range Air Defense Battalion at Fort Sill

**- Activity Start Date**
**Start Month:** 1
**Start Year:** 2024

**- Activity End Date**
**Indefinite:** Yes
**End Month:** N/A
**End Year:** N/A

**- Activity Emissions:**

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| VOC | 1.284559 |
| $SO_x$ | 0.008583 |
| $NO_x$ | 1.135859 |
| CO | 15.068167 |
| PM 10 | 0.027994 |

| Pollutant | Emissions Per Year (TONs) |
|---|---|
| PM 2.5 | 0.024603 |
| Pb | 0.000000 |
| $NH_3$ | 0.078943 |
| $CO_2e$ | 1249.2 |
| | |

## 2.2 Personnel Assumptions

**- Number of Personnel**
**Active Duty Personnel:** 550
**Civilian Personnel:** 0
**Support Contractor Personnel:** 20
**Air National Guard (ANG) Personnel:** 0
**Reserve Personnel:** 0

**- Default Settings Used:** Yes

**- Average Personnel Round Trip Commute (mile):** 20 (default)

**- Personnel Work Schedule**
**Active Duty Personnel:** 5 Days Per Week (default)
**Civilian Personnel:** 5 Days Per Week (default)
**Support Contractor Personnel:** 5 Days Per Week (default)
**Air National Guard (ANG) Personnel:** 4 Days Per Week (default)
**Reserve Personnel:** 4 Days Per Month (default)

## 2.3 Personnel On Road Vehicle Mixture

**- On Road Vehicle Mixture (%)**

| | LDGV | LDGT | HDGV | LDDV | LDDT | HDDV | MC |
|---|---|---|---|---|---|---|---|
| POVs | 37.55 | 60.32 | 0 | 0.03 | 0.2 | 0 | 1.9 |
| GOVs | 54.49 | 37.73 | 4.67 | 0 | 0 | 3.11 | 0 |

## 2.4 Personnel Emission Factor(s)

**- On Road Vehicle Emission Factors (grams/mile)**

| | VOC | $SO_x$ | $NO_x$ | CO | PM 10 | PM 2.5 | $NH_3$ |
|---|---|---|---|---|---|---|---|
| LDGV | 000.301 | 000.002 | 000.232 | 003.573 | 000.007 | 000.006 | 000.023 |
| LDGT | 000.380 | 000.003 | 000.407 | 004.987 | 000.009 | 000.008 | 000.024 |
| HDGV | 000.727 | 000.005 | 001.023 | 015.732 | 000.020 | 000.017 | 000.045 |
| LDDV | 000.108 | 000.003 | 000.133 | 002.588 | 000.004 | 000.004 | 000.008 |
| LDDT | 000.245 | 000.004 | 000.379 | 004.410 | 000.007 | 000.006 | 000.008 |
| HDDV | 000.481 | 000.013 | 004.802 | 001.719 | 000.167 | 000.154 | 000.028 |
| MC | 002.649 | 000.003 | 000.746 | 013.246 | 000.026 | 000.023 | 000.054 |

## 2.5 Personnel Formula(s)

**- Personnel Vehicle Miles Travel for Work Days per Year**
$VMT_P = NP * WD * AC$

$VMT_P$: Personnel Vehicle Miles Travel (miles/year)
NP: Number of Personnel
WD: Work Days per Year
AC: Average Commute (miles)

**- Total Vehicle Miles Travel per Year**
$VMT_{Total} = VMT_{AD} + VMT_C + VMT_{SC} + VMT_{ANG} + VMT_{AFRC}$

$VMT_{Total}$: Total Vehicle Miles Travel (miles)
$VMT_{AD}$: Active Duty Personnel Vehicle Miles Travel (miles)
$VMT_C$: Civilian Personnel Vehicle Miles Travel (miles)
$VMT_{SC}$: Support Contractor Personnel Vehicle Miles Travel (miles)
$VMT_{ANG}$: Air National Guard Personnel Vehicle Miles Travel (miles)
$VMT_{AFRC}$: Reserve Personnel Vehicle Miles Travel (miles)

**- Vehicle Emissions per Year**
$V_{POL} = (VMT_{Total} * 0.002205 * EF_{POL} * VM) / 2000$

$V_{POL}$: Vehicle Emissions (TONs)
$VMT_{Total}$: Total Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
$EF_{POL}$: Emission Factor for Pollutant (grams/mile)
VM: Personnel On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

# C.2 Air Quality Supporting Information

**ENVIRONMENTAL ASSESSMENT FOR**
**MANEUVER -SHORT RANGE AIR DEFENSE BATTALION (M-SHORAD BN)**
**STATIONING AT FORT Sill, OKLAHOMA**

**Action Title:** Fort Sill M-SHORAD **Project Number:** Not applicable

**Project Action Start Date:** January 2024

**Action Purpose and Need**

Purpose is to improve the protection of tactical maneuver forces from current and future aerial threats at Fort Sill. There is a need to improve the Army's dedicated air defense capability in current maneuver formations to counter short-range aerial threats.

**Action Description**

Proposed Action: Station the M-SHORAD BN at Fort Sill, Oklahoma.

Alternative: Do not station the M-SHORAD BN at Fort Sill, Oklahoma.

**General Information**

The BN's Equipment inventory List includes Stryker A1 vehicles, Joint Light Tactical Vehicles, and support vehicles such as pickup trucks. As a conservative approach (worst case), the Stryker A1 is used as a representation of all the assigned vehicles. The Stryker A1 is an eight wheeled (reinforced hard rubber tires) armored tactical vehicle. Depending on configuration the gross weight of a Stryker A1 ranges from 18 to 32 tons. The Stryker A1 engine is 450 horse power, diesel fired (compression ignition) reciprocating internal combustion engine. Maneuvering of the vehicles will take place on paved and unpaved roads and the terrain of the existing Fort Sill training ranges.

**Emissions Calculations Methodology**

Tactical Vehicle Exhaust Emissions

Exhaust emissions are based on emission factors cited for heavy-duty vehicles in the U.S. Air Force document

"Air Emissions Guide for Air Force Mobile Sources", June 2021; Table 5-19

Fugitive Particulate Matter (PM) Emissions

Fugitive PM Emissions are based on emission factors for unpaved roads cited in the U.S. Air Force document

"Air Emissions Guide for Air Force Mobile Sources", June 2021; Table 5-8

**Emission Calculations**

**Tactical Vehicle Exhaust Emissions**

| | | Emission Factors (ef) | | | | |
|---|---|---|---|---|---|---|
| CO | VOC | $NO_x$ | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ | |
| 0.215 | 0.04 | 0.769 | 2.84E-02 | 2.38E-02 | 2.15E-02 | g/mile |

Formula

$E_A$ = ef x 2.205 x $10^{-3}$ lb/g x $MVT_{total}$ x ton /2000 lb

where, $E_A$ = Annual Emission (tpy)

ef = emission factor

$MVT_{total}$ = Total Vehicle Miles Traveled

$MVT_{total}$ = 55,000 miles (derived from ECAM Report)

| **Vehicle Exhaust Annual Emissions** | | | | | | |
|---|---|---|---|---|---|---|
| **0.013** | **0.002** | **0.043** | **0.00016** | **0.001** | **0.001** | **tons** |

**Fugitive PM Emissions**

| Emission Factors (ef) | | | |
|---|---|---|---|
| $PM_{10}$ | | $PM_{2.5}$ | |
| 505.981 | g/mile | 50.598 | g/mile |

Formula

$E_A$ = ef x 2.205 x $10^{-3}$ lb/g x $MVT_{total}$ x ton /2000 lb

where, $E_A$ = Annual Emission (tpy)

ef = emission factor

$MVT_{total}$ = Total Vehicle Miles Traveled

$MVT_{total}$ = 55,000 miles (derived from ECAM Report)

**Fugitive Dust Annual Emissions**

| **$PM_{10}$** | | **$PM_{2.5}$** | **Unit** |
|---|---|---|---|
| **30.681** | **tons** | **3.068** | **tons** |

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# Appendix D

# Biological Resources Supporting Information

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# D.1 U.S. Fish and Wildlife Service Information for Planning and Consultation (IPaC) Report for Comanche County, Oklahoma

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Oklahoma Ecological Services Field Office
9014 East 21st Street
Tulsa, OK 74129-1428
Phone: (918) 581-7458 Fax: (918) 581-7467

In Reply Refer To: October 24, 2022
Project Code: 2023-0007912
Project Name: Environmental Assessment for Maneuver-Short Range Air Defense Battalion at Fort Sill, Oklahoma

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)

(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

**Migratory Birds**: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

# Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**Oklahoma Ecological Services Field Office**
9014 East 21st Street
Tulsa, OK 74129-1428
(918) 581-7458

## Project Summary

Project Code: 2023-0007912

Project Name: Environmental Assessment for Maneuver-Short Range Air Defense Battalion at Fort Sill, Oklahoma

Project Type: Military Operations

Project Description: The proposed action includes four primary elements: (1) the stationing of approximately 550 Soldiers and associated dependents to Fort Sill; (2) the stationing of M-SHORAD vehicles, equipment, and support infrastructure on Fort Sill; (3) the utilization of buildings and facilities on Fort Sill; and (4) M-SHORAD Bn maneuver and training requirements for Fort Sill.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@34.7028215,-98.45161046642912,14z


Counties: Comanche County, Oklahoma

## Endangered Species Act Species

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

### Mammals

| NAME | STATUS |
|---|---|
| Tricolored Bat *Perimyotis subflavus*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/10515 | Proposed Endangered |

### Birds

| NAME | STATUS |
|---|---|
| Piping Plover *Charadrius melodus*<br>Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered.<br>There is **final** critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/6039 | Threatened |
| Red Knot *Calidris canutus rufa*<br>There is **proposed** critical habitat for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/1864 | Threatened |
| Whooping Crane *Grus americana*<br>Population: Wherever found, except where listed as an experimental population<br>There is **final** critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/758 | Endangered |

## Insects

| NAME | STATUS |
|---|---|
| Monarch Butterfly *Danaus plexippus*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/9743 | Candidate |

## Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

# USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

The following FWS National Wildlife Refuge Lands and Fish Hatcheries lie fully or partially within your project area:

| FACILITY NAME | ACRES |
|---|---|
| WICHITA MOUNTAINS WILDLIFE REFUGE<br>https://www.fws.gov/refuges/profiles/index.cfm?id=21670 | 58,473.787 |

# Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

**The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location.** To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

| NAME | BREEDING SEASON |
|---|---|
| Bald Eagle *Haliaeetus leucocephalus*<br>This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. | Breeds Oct 15 to Jul 31 |
| Black-capped Vireo *Vireo atricapilla*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/5716 | Breeds Apr 1 to Sep 15 |

| NAME | BREEDING SEASON |
|---|---|
| Chestnut-collared Longspur *Calcarius ornatus*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. | Breeds elsewhere |
| Chimney Swift *Chaetura pelagica*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. | Breeds Mar 15 to Aug 25 |
| Golden Eagle *Aquila chrysaetos*<br>This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.<br>https://ecos.fws.gov/ecp/species/1680 | Breeds Jan 1 to Aug 31 |
| Lesser Yellowlegs *Tringa flavipes*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/9679 | Breeds elsewhere |
| Red-headed Woodpecker *Melanerpes erythrocephalus*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. | Breeds May 10 to Sep 10 |
| Sprague's Pipit *Anthus spragueii*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/8964 | Breeds elsewhere |
| Western Grebe *aechmophorus occidentalis*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/6743 | Breeds Jun 1 to Aug 31 |
| Willet *Tringa semipalmata*<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. | Breeds Apr 20 to Aug 5 |

## Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

**Probability of Presence (■)**

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see

below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

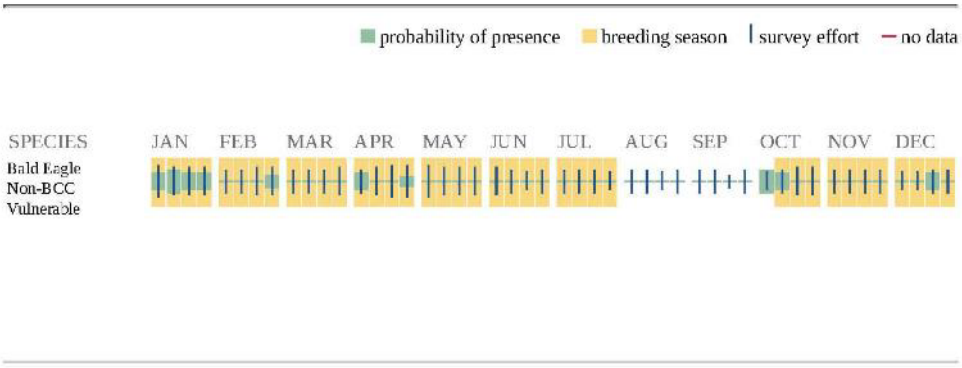
1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

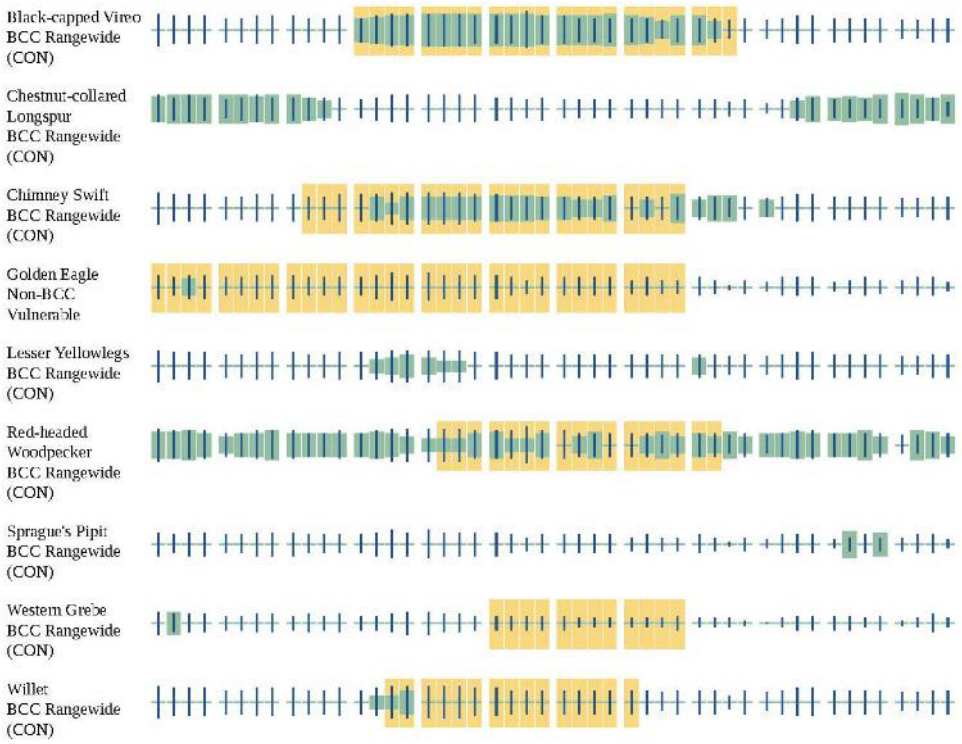
**Breeding Season (■)**
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

**Survey Effort (|)**
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

**No Data (–)**
A week is marked as having no data if there were no survey events for that week.

**Survey Timeframe**
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.






Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

## Migratory Birds FAQ

**Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.**

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits

may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

**What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?**
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

**What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?**
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

**How do I know if a bird is breeding, wintering or migrating in my area?**
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

**What are the levels of concern for migratory birds?**
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);

2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

**Details about birds that are potentially affected by offshore projects**

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

**What if I have eagles on my list?**

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

**Proper Interpretation and Use of Your Migratory Bird Report**

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities,

should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

# Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

Due to your project's size, the list below may be incomplete, or the acreages reported may be inaccurate. For a full list, please contact the local U.S. Fish and Wildlife office or visit https://www.fws.gov/wetlands/data/mapper.HTML

RIVERINE

- Riverine

FRESHWATER EMERGENT WETLAND

- Palustrine

## IPaC User Contact Information

Agency: Juniper Environmental, LLC
Name: Jessica Householder
Address: 1 Alby Street
City: Alton
State: IL
Zip: 62002
Email jessica.householder@juniperenv.com
Phone: 2176895016

# D.2 Oklahoma Department of Wildlife Conservation (ODWC) Threatened and Endangered Species List for Comanche County

OBS Ref. 2022-511-BUS-JUN

Dear Ms. Householder, October 31, 2022

We have reviewed occurrence information on federal and state threatened, endangered or candidate species, as well as non-regulatory rare species and ecological systems of importance currently in the Oklahoma Natural Heritage Inventory database for the following location you provided:

Fort Sill Base, portions of T2N-R10W through T2N-R15W and T3N-R10W through 3N-R15W, Comanche County

We found 8 occurrence(s) of relevant species within the vicinity of the project location as described.

| Species Name | Common Name | Federal Status |
|---|---|---|
| ***Coccyzus americanus*** | **Yellow-billed Cuckoo** | **Threatened** |
| ***County*** | ***TRS*** | ***Count*** |
| Comanche | Sec. 9-T2N-R12W | 2 |
| ***Grus americana*** | **Whooping Crane** | **Endangered** |
| ***County*** | ***TRS*** | ***Count*** |
| Comanche | Sec. 10-T2N-R14W | 1 |
| ***Perimyotis subflavus*** | **Tricolored bat** | **Proposed Endangered** |
| ***County*** | ***TRS*** | ***Count*** |
| Comanche | Sec. 9-T2N-R12W | 5 |

Additionally, absence from our database does not preclude such species from occurring in the area.

If you have any questions about this response, please send me an email, or call us at the number given below.

Although not specific to your project, you may find the following links helpful.

ONHI, guide to ranking codes for endangered and threatened species:
http://www.oknaturalheritage.ou.edu/content/biodiversity-info/ranking-guide/

Information regarding the Oklahoma Natural Areas Registry:
https://okregistry.wordpress.com/

Todd Fagin
Oklahoma Natural Heritage Inventory
(405) 325-4700
tfagin@ou.edu

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