FINAL

PRELIMINARY ASSESSMENT REPORT OF PFAS FORT CHAFFEE, ARKANSAS

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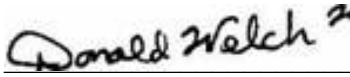

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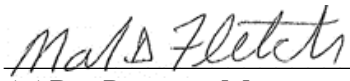

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TABLE OF CONTENTS

EXECUTIVE SUMMARY ES-1
1.0 INTRODUCTION 1
1.1 Project Background 1
1.2 PA Objectives 1
1.3 PA Process Description 2
2.0 INSTALLATION OVERVIEW 6
2.1 Site Terminology 6
2.2 Site Location 6
2.3 Pre-BRAC Mission and Brief Site History 6
2.4 BRAC Events 8
2.5 Climate 10
2.6 Geology 10
2.7 Topography 11
2.8 Hydrogeology 11
2.9 Surface Water Hydrology 12
2.10 Relevant Utility Infrastructure 12
2.11 Potable Water Supply and Drinking Water Receptors 13
2.12 Ecological Receptors 13
2.13 Previous PFAS Investigations 14
2.14 Exposure/Migration Pathways and Targets 15
3.0 SUMMARY OF PA ACTIVITIES 19
3.1 Records Review 19
3.2 Personnel Interviews 19
3.3 Site Reconnaissance 20
4.0 POTENTIAL PFAS USE, STORAGE, AND/OR DISPOSAL AREAS 21
4.1 AFFF Use, Storage, and Disposal Areas 21
4.2 Other PFAS Use, Storage, and/or Disposal Areas 25
4.3 Readily Identifiable Off-Post PFAS Sources 26
5.0 SUMMARY AND DISCUSSION OF PA RESULTS 28
5.1 AOPIs 28
5.2 Areas Not Retained for Further Investigation 34
6.0 CONCLUSIONS AND RECOMMENDATIONS 57
7.0 REFERENCES 62
APPENDIX A: Office of the Deputy Chief of Staff, Department of the Army. 2021. Memorandum: Notification & Authorization Pursuant to Releases of PFAS on BRAC Property & BRAC Transferred Property A-1

APPENDIX B: PA Quality Control Checklist.....B-1
APPENDIX C: GIS Deliverable CD (Included in Final Electronic Deliverable Only) C-1
APPENDIX D: Installation EDR Survey Reports D-1
APPENDIX E: Research Log E-1
APPENDIX F: Compiled Interview Logs F-1
APPENDIX G: Site Reconnaissance Photo Log G-1
APPENDIX H: Compiled Site Reconnaissance Logs H-1

LIST OF TABLES

Table 1-1. Screening Levels from the 2022 OSD Memorandum……..3
Table 2-1: Historical PFAS Analytical Results 14
Table 5-1: Installation Areas Not Retained for Further Investigation 35
Table 6-1: Summary of Locations Identified During the PD, Recommendations & Rationale .. 57

LIST OF FIGURES

Figure 2-1: Site Location 15
Figure 2-2: Site Layout 16
Figure 2-3: Topographic Map 17
Figure 2-4: Off-Post Potable Supply Wells 18
Figure 5-1: AOPI Decision Flowchart 28
Figure 5-2: AOPI Locations 38
Figure 5-3: Aerial Photo of Original Fire Training Area (FTCH-022) & New Fire Training Area AOPIs 40
Figure 5-4: Aerial Photo of Bldg. 5850 Airfield Fire Fighter & Rescue Fire Station AOPI 42
Figure 5-5: Aerial Photo of Bldg. 2100 Primary Fire Station AOPI 44
Figure 5-6: Aerial Photo of Bldg. 139 Central Cantonment Area Fire Station AOPI 46
Figure 5-7: Aerial Photo of Bldg. 2360 Fire Station & Warehouse AOPI 48
Figure 5-8: Aerial Photo of Bldg. 1852 Northeast Cantonment Area Fire Station AOPI 50
Figure 5-9: Aerial Photo of Bldg. 3799 Hospital Area Fire Station AOPI 52
Figure 5-10: Aerial Photo of FTCH-011 Sewage Lagoons & FTCH-033 Oil/Water Separator Disposal Area AOPIs 54
Figure 5-11: Aerial Photo of FTCH-043 East Land Application Site AOPI 56
Figure 5-12: Aerial Photo of FTCH-044 West Land Application Site AOPI 58
Figure 5-13: Aerial Photo of Arrowhead Landing Strip AOPI 60
Figure 5-14: Aerial Photo of Rattlesnake Landing Strip AOPI 62
Figure 5-15: Aerial Photo of Heliport 1 & Heliport 4 AOPIs 64
Figure 5-16: Aerial Photo of Heliport 2 & Heliport 3 AOPIs 66
Figure 5-17: Aerial Photo of Fort Chaffee Airfield AOPI 68
Figure 5-18: Non-AOPI Locations 70

ACRONYMS AND ABBREVIATIONS

Acronym	Definition
AAR	ARS Aleut Remediation
AFFF	aqueous film-forming foam
ANG	Arkansas National Guard
AOPI	areas of potential interest
ARARNG	Arkansas Army National Guard
Arcadis	Arcadis U.S., Inc.
Army	U.S. Army
ARNG	Army National Guard
BCP	BRAC Cleanup Plan
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, & Liability Act of 1980
CERFA	Community Environmental Response Facilitation Act
DDT	Dichlorodiphenyltrichloroethane
DNT	Dinitrotoluene
DoD	U.S. Department of Defense
DOE	Department of Energy
DERP	Defense Environmental Restoration Program
EDR	Environmental Data Resources, Inc.
ERM	Environmental Resource Management Group
FCJMTC	Fort Chaffee Joint Maneuver Training Center
FTCH	Original Fire Training Center
GIS	geographic information system
HFPO-DA	hexafluoropropylene oxide dimer acid
HQDA	Headquarters, Department of the Army
installation	U.S. Army or Reserve installation
ITRC	Interstate Technology Regulatory Council
JRTC	Joint Readiness Training Center
mg/kg	milligram/kilogram
NCOA	Noncommissioned Officer Academy
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
ng/L	nanograms per liter (parts per trillion)
OB/OD	open burn/open detonation
OSD	Office of the Secretary of Defense
PA	Preliminary Assessment
PBX	plastic-bonded explosives
PCTFE	polychlorotrifluoroethylene
PFAS	per- and polyfluoroalkyl substances

Acronym	Definition
PFBS	perfluorobutanesulfonic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
POC	points of contact
POL	Petroleum, Oil, and Lubricant
PTFE	polytetrafluoroethylene
PWS	public water system
RC	Reserve Components
U.S.	United States
UCMR3	third Unregulated Contaminant Monitoring Rule
USACE	U.S. Army Corps of Engineers
USAG	U.S. Army Garrison
USAR	U.S. Army Reserve
USEPA	U.S. Environmental Protection Agency

EXECUTIVE SUMMARY

The objective of a Preliminary Assessment (PA) is to identify areas of potential interest (AOPIs) based on whether use, storage, or disposal of potential per- and polyfluoroalkyl substances (PFAS)-containing materials, including aqueous film-forming foam (AFFF), occurred in accordance with the 2018 Army *Guidance for Addressing Releases of Per-and Polyfluoroalkyl Substances* (United States [U.S.] Army 2018). A PA for PFAS-containing materials with a focus on perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), perfluorobutane sulfonate (PFBS), perfluorononanoic acid (PFNA), perfluorohexane sulfonate (PFHxS), and hexafluoropropylene oxide dimer acid (HFPO-DA) and its ammonium salt ("GenX" chemicals) was completed at Fort Chaffee, to assess potential PFAS release areas and exposure pathways. This Fort Chaffee PA was completed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, The National Oil and Hazardous Substance Pollution Contingency Plan (NCP), the Defense Environmental Restoration Program (DERP), Army/U.S. Department of Defense (DoD) policy and guidance, Guidance for Performing Preliminary Assessments Under CERCLA (U.S. Environmental Protection Agency [USEPA] 1991), and the Federal Facilities Remedial Preliminary Assessment Summary Guide (USEPA 2005).

Fort Chaffee is located approximately six miles southeast of Fort Smith in the Ozark Mountains of the west central part of Arkansas. The maximum extent for the installation was estimated to be approximately 71,400 acres that extended through Sebastian County, Crawford County, and Franklin County in Arkansas (U.S. Army Garrison [USAG] 1991). The 1995 Base Realignment and Closure (BRAC) Commission recommended the closure of Fort Chaffee with the retention of essential ranges, facilities, and training areas to be used as a Reserve Component Training enclave for the conduct of individual and annual training. In late 1995, the federal government declared approximately 7,000 acres of Fort Chaffee to be surplus, and the remaining approximate 64,400 acres were licensed to the Arkansas National Guard (ANG) or the Arkansas Army National Guard (ARARNG) for operation of a training facility. On 27 September 1997, the active-duty garrison was closed and the ARARNG took control of those 64,400 acres, which became known as the Fort Chaffee Joint Maneuver Training Center (FCJMTC). This area is broken down into cantonment, maneuver, artillery impact, and special use areas. The remaining 7,000 acres (identified as the BRAC Surplus Property) was transferred for primarily non-federal control to the Fort Chaffee Redevelopment Authority, which has overseen the sale of the parcels within the BRAC Surplus Property for industrial, commercial, and residential redevelopment. Additionally, a small amount of BRAC Surplus Property was transferred to other Federal organizations such as the U.S. Army Reserve (USAR) and the U.S. Department of Energy (DOE). Final conveyances were completed on 24 September 2003 (Headquarters, Department of the Army [HQDA] 2019). This PA focuses on the 71,400 acres of property that was controlled and operated by the DoD/Active Army that comprised Fort Chaffee prior to the 1997 BRAC event.

In conducting the PA of the BRAC property at Fort Chaffee, 21 AOPIs were identified where a potential for release of PFAS exists resulting from site operational history. AOPIs were identified at potential PFAS-release locations on the Fort Chaffee.

Based on the potential PFAS releases at the AOPIs, the potential for exposure to PFAS contamination in soil exists. In addition, the potential for off-post exposure in groundwater exists, as on-post groundwater could influence downgradient drinking water sources. Given the findings of this PA, the AOPIs presented warrant further evaluation in a Site Investigation (SI).

1.0 INTRODUCTION

The Army conducted this Preliminary Assessment (PA) to investigate the potential presence of Per-and Polyfluoroalkyl Substances (PFAS) at Fort Chaffee in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, 42 U.S.C. §9601 et. seq.), the Defense Environmental Restoration Program (DERP, 10 U.S.C. §2701 et. seq.), the National Oil and Hazardous Substances Pollution Contingency Plan (NCP, 40 CFR Part 300), and guidance documents developed by the U.S. Environmental Protection Agency (USEPA) and the Department of the Army. Fort Chaffee is not on the National Priorities List and the U.S. Army (Army) is responsible for compliance with CERCLA in accordance with Executive Order 12580, as amended.

The purpose of this PFAS PA is to identify locations that are areas of potential interest (AOPIs) on the former Fort Chaffee based on the use, storage and/or disposal of potential PFAS-containing materials, in accordance with the 2018 Army *Guidance for Addressing Releases of Per-and Polyfluoroalkyl Substances* (Army 2018). The PA was conducted in general accordance with 40 CFR §300.420(b) and the U.S. Environmental Protection Agency (USEPA *Guidance for Performing Preliminary Assessments Under CERCLA* (USEPA 1991) and the U.S. Army (Army *Guidance for Addressing Releases of Per- and Polyfluoroalkyl Substances* (U.S. Army 2018). This report presents findings from research conducted to assess past use of materials containing PFAS and identify areas where these materials were stored, handled, used, or disposed at Fort Chaffee.

The entirety Fort Chaffee property was evaluated for this PFAS PA, including Army-owned property as well as transferred property. References to Fort Chaffee on- and off-post within this PA refer to the original Fort Chaffee property boundary prior to closure. Fort Chaffee is located six miles southeast of Fort Smith in the Ozark Mountains of the west central part of Arkansas, as shown in **Figure 2-1**.

1.1 Project Background

PFAS are a group of synthetic compounds that have been manufactured and used extensively worldwide since the 1950s for a variety of purposes. PFAS are stable, man-made fluorinated organic chemicals that repel oil, grease, and water. Common industrial uses of PFAS include paints, varnishes, sealants, hydraulic fluid, surfactants, and firefighting foams. PFAS include both per- and polyfluorinated compounds. Perfluorinated compounds, such as perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), perfluorobutanesulfonic acid (PFBS), perfluorononanoic acid (PFNA), perfluorohexane sulfonate (PFHxS), and hexafluoropropylene oxide dimer acid (HFPO-DA or Gen X) are a subset of PFAS with completely fluorinated carbon chains, while polyfluorinated compounds have at least one carbon chain atom that is not fully fluorinated. These six PFAS compounds together, and for the purposes of this PA, are referred to in this report as “target PFAS.”

Fort Chaffee was evaluated for all potential use, storage, and/or disposal of PFAS-containing materials. There are a variety of PFAS-containing materials used in relation to current and historical Army operations. However, the use, storage, and/or disposal of aqueous film-forming foam (AFFF) is the most common potential source of PFAS chemicals at DoD facilities. As

such, this section is organized to summarize the AFFF-related sources first, and all remaining potential PFAS-containing materials in the subsequent paragraph. AFFF is used as a firefighting agent to suppress petroleum hydrocarbon fires and vapors. Firefighting foams like AFFF were developed in the 1960s (Interstate Technology Regulatory Council [ITRC] 2020a), but AFFF did not see widespread DoD use until the early 1970s. Older fire training facilities often were unlined and not constructed to prevent infiltration of firefighting foams and combustion products leaching into the subsurface. Large quantities of AFFF may have been released into the environment as a result of fire training exercises, fire responses, fire suppression system activations, and tank and pipeline leaks/spills.

Other potential PFAS sources considered include installation storage warehouses, metal plating activities, some pesticide use, automobile maintenance shops, photo processing facilities, laundry/water-proofing facilities, car washes, stormwater or sanitary sewer components, and biosolid application areas.

Many PFAS compounds are highly soluble in water and have low volatility due to their ionic nature. The specific gravity/relative density for PFOS and PFOA is 1.8 (ITRC 2020c). Long-chain perfluorinated compounds have low vapor pressure and are expected to persist in aquatic environments. These compounds do not readily degrade by most natural processes. They are thermally, chemically, and biologically stable, and are resistant to biodegradation, atmospheric photooxidation, direct photolysis, and hydrolysis. The structure of these compounds increases their resistance to degradation; the carbon-fluorine bond is one of the strongest in nature, and the fluorine atoms shield the carbon backbone.

When PFAS are released to the environment, they can readily migrate into soil, groundwater, surface water, and sediment. Once in the environment, the compounds are persistent and may continue to migrate through airborne transport, surface water, groundwater, and/or biologic uptake. The amount of PFAS entering the environment depends on the type and amount of the PFAS material that may have been released, where and when it was used, the type of soil, and other factors. If private or public wells are located nearby, they potentially could be affected by PFAS. Similarly, surface water features may be impacted and may convey PFAS to downgradient receptors.

Of the thousands of PFAS chemicals, some are considered precursor compounds (typically polyfluoroalkyl substances). Precursor compounds can abiotically or biotically transform into PFOS and PFOA. PFOS and PFOA are referred to as terminal PFAS, meaning no further degradation products will form from them (ITRC 2020b).

1.2 PA Objectives

The purpose of a PA under the NCP is to 1) eliminate from further consideration those sites that pose no threat to public health or the environment; 2) determine if there is any potential need for removal action; 3) set priorities for Site Inspections (SIs); and 4) gather existing data to facilitate evaluation for the release pursuant to the Hazard Ranking System, if warranted (40 CFR §300.420(b)(1)).

The primary objective of the PA is to identify and evaluate locations at Fort Chaffee where there was use, storage, or disposal of PFAS-containing materials resulting in a potential release of PFAS to the environment and conduct an initial assessment of possible migration pathways of potential contamination. This PA also includes development of a preliminary conceptual site model (CSM) for AOPIs related to PFAS.

Please note that the focus of this PA is on the Active Army use of Fort Chaffee prior to the 1997 BRAC event that subdivided the site into portions for Arkansas Army National Guard (ARARNG) and non-DoD use. The use of potential PFAS-containing materials after the 1997 BRAC event is not the focus of this PA.

1.0.1 **PFAS REGULATORY OVERVIEW AND SCREENING CRITERIA** In May 2016, USEPA issued lifetime health advisories (LHAs) for PFOA and PFOS under the Safe Drinking Water Act (SDWA). To provide Americans, including the most sensitive populations, with a margin of protection from a lifetime of exposure to PFOS and PFOA in drinking water, USEPA established a health advisory level for PFOS and PFOA (individually or combined) of 70 nanograms per liter (ng/L) (parts per trillion [ppt]) (USEPA 2016).

In October 2019, the Office of the Assistant Secretary of Defense (OSD) issued guidance on investigation of PFOS, PFOA, and PFBS at DoD restoration sites. The OSD guidance provided risk screening levels for PFOS, PFOA, and PFBS in (groundwater) tapwater and soil, based on the USEPA Regional Screening Level (RSL) calculator for residential and industrial reuse and using the oral reference dose of 2E-05 mg/kg (milligram/kilogram)-day. USEPA Office of Water, USEPA provided new screening levels for PFOA, PFOS, PFNA, PFHxS, and HFPO-DA.

In July 2022, OSD issued a policy memorandum adopting these new screening levels to be used during the SI-phase to determine whether further investigation in a RI is warranted. This revised guidance is in effect as of July 2022 and is applicable to investigating PFOS, PFOA, PFBS, PFNA, PFHxS, and HFPO-DA at DoD restoration sites, including BRAC sites (DoD 2022). Currently, no legally enforceable Federal standards exist for PFAS in groundwater, surface water, soil, or sediment.

Table 1-1. Screening Levels from the 2022 OSD Memorandum

Chemical	Residential Tap Water HQ = 0.1 (ng/L or ppt)	Residential Soil HQ = 0.1 (µg/kg [microgram per kilogram] or ppb [parts per billion)
HFPO-DA (GenX)	6	23
PFBS	601	1,900
PFHxS	39	130
PFNA	6	19

PFOA	6	19
PFOS	4	13

Note
The Residential Tap Water SLs are used to evaluate groundwater and surface water data. The Residential Soil SLs are used to evaluate soil and sediment data.

The Army's strategy is to continue to assess and investigate potential releases and implement necessary response actions in accordance with CERCLA to ensure that no human health-based exposures are above the CERCLA risk-based values in drinking water. Therefore, sites where human exposure to contaminated drinking water exists will be addressed first and as quickly as possible to eliminate the exposure, and then will be subsequently prioritized and sequenced to conduct the investigations and response actions necessary to characterize and, if necessary, remediate the source of PFAS

1.3 PA Process Description

The PA for Fort Chaffee included a site visit, aerial photographic analysis, records review, and interviews that were conducted in accordance with the methods detailed in PA Quality Control Checklist (Appendix B). The Checklist outlines the approach and methodology for conducting the PFAS PA. As detailed in the Checklist, the PA activities focused on ascertaining and documenting the following information regarding PFAS history and use, storage or disposal at Fort Chaffee.

- On-post fire training activities;
- Use of PFAS-based AFFF in fire suppression systems or other systems;
- AFFF stored, used, and/or disposed of at buildings and crash sites;
- Activities or use of materials that are likely to contain PFAS constituents, such as chrome plating operations.
- Wastewater treatment plants (WWTPs) and landfills that may have received PFAS-containing materials;
- Studies conducted to assess environmental impacts at the facility;
- Potential PFAS use at parcels post transfer;
- Potential off-post sources that may impact Fort Chaffee

The data gathered during PA activities are summarized in Sections 1.3.1 through 1.3.3 below. Section 3 provides a summary of the PA activities completed at Fort Chaffee.

1.3.1 Pre-Site Visit

First, an installation kickoff teleconference was held between applicable points of contact (POC) from the U.S. Army Corps of Engineers (USACE), the Army BRAC organization, ARS Aleut Remediation (AAR), and Arcadis U.S., Inc. (Arcadis). The kickoff call occurred on 26 January 2022, before the site visit to discuss the goals and scope of the PA, project scheduling, installation access, timeline for the site visit, access to installation-specific databases, and to request available records.

Records research was conducted before the site visit to obtain electronically available documents from the installation and external sources for review. The purpose of the records research was to identify any area on the installation that may have been a location where PFAS-containing materials were used, stored, and/or disposed, as well as to gather information on the physical setting and site history at Fort Chaffee (40 C.F.R. 300.420(b)(2)).

1.3.2 Preliminary Assessment Site Visit

The site visit was conducted on 31 January through 01 February 2022. An in-briefing was held to provide the ARARNG staff at Fort Chaffee with the objectives of the site visit and team introductions.

Personnel interviews were conducted with military and civilian individuals having significant historical knowledge at Fort Chaffee. The interviews focused on confirming information discussed in historical documents, collecting information that may have not been in historical documents, corroborating other interviewees' information. **Section 3** includes information regarding personnel interviewed.

Site reconnaissance included visual surveys that assessed the points of potential use, storage, and/or disposal of PFAS-containing materials, as well as potential secondary impacts, and the migration potential from each AOPI (e.g., stormwater drains, building drains and sumps, cracks in the floor/pavement). Physical attributes of the preliminary locations were documented, including local slope and ground and floor conditions (i.e., paved, unpaved, visual staining), surface water bodies and surface flow, potential receptors, and the distance to the installation boundary. Access to existing groundwater monitoring wells, if present, were also noted during the site reconnaissance in case the monitoring wells could be proposed for SI sampling. Photo documentation of the preliminary locations was collected, and access limitations or advantages related to potential future sampling activities were noted.

An exit briefing is typically held following the conclusion of the PA site visit. However, the contractor field staff demobilized from the site on 01 February 2022 due to a winter storm and The findings identified during the PA were communicated during a conference call held on 14 February 2022.

1.3.3 Post-Site Visit

Information collected before, during, and after the site visit was reviewed and corroborated by cross-referencing records and reviewing interview details and observations noted during site visit reconnaissance. A site visit trip report was completed and provided to the installation POC, applicable Army Environmental Command POCs, and USACE regional POCs following the site visit. Map document files and associated geographic information system (GIS) data are provided as ***Appendix C***. GIS data layers created for the project are included in a Spatial Data Standards for Facilities, Infrastructure, and Environment-compliant geodatabase.

2.0 INSTALLATION OVERVIEW

The following subsections provide general information about Fort Chaffee, including the location and layout, the installation mission(s) over time, a brief site history, current and projected land use, climate, topography, geology, hydrogeology, surface water hydrology, potable wells within a 4-mile radius of the installation, and applicable ecological receptors.

2.1 Site Terminology

Fort Chaffee, Arkansas, including other iterations (e.g., Camp Chaffee) was activated in 1942. The maximum extent of the Fort Chaffee installation is shown on ***Figure 2-1***. The DoD/Active Army operated Fort Chaffee until the 1997 BRAC event when the installation was apportioned into two primary areas identified as the Fort Chaffee Joint Maneuver Training Center (FCJMTC; operated by the ARARNG) and the BRAC Surplus Property (property no longer under Federal Government control) as shown on ***Figure 2-1***. Therefore, text and figure references to Fort Chaffee indicate discussion regarding DoD/Active Army operation of the site prior to the 1997 BRAC closure referred to as "Pre-BRAC" throughout this document. Text and figure references to the FCJMTC and the BRAC Surplus Property indicate discussions related to post 1997 BRAC event operations and referred to as "Post-BRAC" throughout this document.

2.2 Site Location

Fort Chaffee is located approximately six miles southeast of Fort Smith, Arkansas in the Ozark Mountains of the west central part of Arkansas. The original area acquired for Fort Chaffee was 76,075 acres. After disposal, corrected surveys, and audits, the area encompassing Fort Chaffee was estimated to be approximately 71,400 acres that extended through Sebastian County, Crawford County, and Franklin County in Arkansas (Environmental Resource Management Group [ERM] 1996).

2.3 Pre-BRAC Mission and Brief Site History

Fort Chaffee has a long history as a major training area for all military services, including Active Components (those who are in the Army as their full-time occupation) and Reserve Components (RC), made up of the U.S. Army National Guard (ARNG) and U.S. Army Reserve (USAR), for several civilian agencies, and for other agencies including the U.S. Department of Energy (DOE), the Federal Bureau of Investigation, the Federal Marshal Service, Navy Sea, Air, Land special forces, the Justice Department, and the Department of the Interior. At the time of the 1995 BRAC commission's recommendation of closure, the mission of Fort Chaffee was to maintain a major training area for the Army and to serve as a Forces Command designated mobilization station and contingency mission site.

The facilities of Fort Chaffee made it uniquely qualified as a host for a wide array of training activities. In addition to the standard small arms ranges, Fort Chaffee also had two tactical landing strips, 19 drop zones, two mock villages, a mock prisoner of war compound, a Military Operation Urban Terrain site, a live-fire complex, a river-crossing site, and a 6,000-acre artillery impact area. Each year, more than 3,000 sorties were flown by active and RC members of the Air

Force, Navy, and Marines using an ARARNG-operated high-performance aircraft bombing and gunnery complex located on Fort Chaffee. In 1994, more than 10,000 Active Components and 40,000 RC soldiers trained at Fort Chaffee (Department of the Army 1996). From 1987 to 1993, the mission was to host and provide support for the Joint Readiness Training Center (JRTC).

In addition to its training support mission, Fort Chaffee was the mobilization site for 46 units with 10,500 assigned soldiers. Further, it served as a site for accommodation of contingency missions involving large numbers of people in resettlement programs.

The installation was activated on 27 March 1942 as Camp Chaffee. From 1948 until 1957, the mission was to host and support the 5th Armored Division. During World War II, several Armored Divisions trained there, and it served as a prisoner of war camp for enemy combatants. In 1957, the installation was renamed Fort Chaffee, and the Field Artillery Training Center was moved to Fort Sill, Oklahoma. From 1957 to 1959, the mission was to host and provide support as the Army's Field Artillery Training Center. From 1961 to 1962, the mission was to host and provide support for the 100th Infantry Division. From 1962 to 1986, the mission was to provide RC Training. It was declared inactive intermittently from 1960 to 1974. From 1975 to 1976, Fort Chaffee processed refugees from Southeast Asia and in May 1980, it began processing Cuban refugees.

2.3.1 Pre-BRAC Tenants and Operations

On-post activities (refers to any activity that was on the original Fort Chaffee boundary, prior to BRAC closure) included those related to the Garrison, site support, post exchange, and training activities. Garrison activities included physical plant and facility maintenance, grounds maintenance, roads and railroads maintenance, land management, pest control, as well as fire protection and prevention. Site support activities, including site support services to the USAR and ARNG, were under the responsibility of the Reserve Garrison. Post exchange activities included serving the retired military community in western Arkansas and eastern Oklahoma, as well as the USAR and ARNG troops while they were on active duty on weekends and in summer periods. As stated, training activities were the major use of lands and facilities. Army, Marine, and Navy reservists, ARARNG units, Reserve Officer Training Corps units, other units, and non-military tenants (listed below) were supported in their training activities (ERM 1996).

Training for the ARNG and USAR typically took place between May and September. Training activities at the installation included firing of artillery, operations by helicopters, fixed aircraft, and use of a jet aircraft bombing range. Inactive duty training had trained in two-day sessions for 15 weekends out of the year. U.S. Air Force High-performance Aircraft Range (Range 87) had year-round, daily training in the artillery impact area. JRTC training, when it was stationed at the installation, trained year-round (U.S. Army Garrison [USAG] 1991).

USAR tenant units included:

- 4003 USAG Support Unit
- 1st Battalion, 95th Training Support Brigade, 95th Division (institutional training)

- Noncommissioned Officer Academy (NCOA)
- Regional Training Sites - Medical
- USAR Forces Schools
- Equipment Concentration Site #15
- 271st Maintenance Company

National Guard tenant units included:

- 142nd Field Artillery Brigade
- 1-233d Air Defense Artillery Battalion
- Air Force Units Included:
- 188th Tactical Fighter Group

Additional tenants included:

- Regional Training Brigade
- DOE
- Worldwide Distributor of Graphic Training Aids
- Miles Contract Logistical Support Site
- U.S. Marshal
- Defense Reutilization and Marketing Office

2.4 BRAC Events

The 1991 BRAC Commission recommended that Fort Chaffee be returned to semi-active status with an Active Component Garrison to be used in support of RC Training. However, the permanent JRTC would be moved from Fort Chaffee and established at Fort Polk, Louisiana. This move was completed in 1993.

The 1995 BRAC Commission recommended the closure of Fort Chaffee with the retention of essential ranges, facilities, and training areas to be used as a RC training enclave for the execution of individual and annual training. In late 1995, the federal government declared approximately 7,000 acres of Fort Chaffee to be surplus (identified as the BRAC Surplus Property), and the remaining approximately 64,400 acres were transferred to the ARARNG for operation of a training facility, remaining under DoD control. On 27 September 1997, the active-duty garrison was closed and the ARARNG took control of those 64,400 acres, which became known as the FCJMTC. This area is broken down into cantonment, maneuver, artillery impact, and special use areas. Approximately 7,000 acres was transferred from federal control to the Fort Chaffee Redevelopment Authority. A small amount of the BRAC Surplus Property acreage was transferred to other Federal organizations such as the USAR and the DOE. Final conveyances were completed on 24 September 2003 (Headquarters, Department of the Army [HQDA] 2019). At the time of closure, tenants at Fort Chaffee included, but were not limited to the following (U.S. Army Training and Doctrine Command 1995):

- USAR NCOA, providing training to approximately 3,500 soldiers annually. The academy occupied approximately 151,000 square feet of facility space. It was set to remain in the RC enclave.
- Regional Training Site-Medical, providing training for Continental U.S. hospitals equipped with Deployable Medical Systems. It occupied 72,000 square feet of facility space and was set to remain in the RC enclave.
- The Equipment Concentration Site 15 received, stored, and maintained equipment for USAR units. It occupied a 27,268 square foot vehicle maintenance building and a 39,934 square foot warehouse building. It was set to remain in the RC enclave, but later dissolved by 2005 BRAC.
- The USAG Support Unit occupied 60,000 square feet of facility space. Some area did not remain within the RC enclave and was consolidated to fit.
- Regional Training Brigade as an Active Component unit tasked to provide combat arms, squad/platoon, and company lanes training to ARNG and USAR units. Their training footprint is not described but was assumed to be within the RC enclave.
- The 271st Maintenance Company provided maintenance to 122d Army RC units. It occupied 51,000 square feet of facility within the RC enclave.
- The Logistics Assistance Office was located within the RC enclave area.
- USAR Medical Department Troop Medical Clinic provided health services to eligible personnel. It was eliminated in 1997 during closure activities.
- DOE Safeguard Division conducted courier training for the DOE, occupying 33,000 square feet of facility space outside of the RC enclave, but would later claim this area during the federal screening process.
- The Defense Reutilization and Marketing Office accepted and disposed of excess government equipment and hazardous materials/waste for Fort Chaffee; disestablishing after disposal services completed after 1998.
- The 188th Tactical Fighter Group (ANG) utilized the bombing and strafing range and was within the RC enclave.
- The Organizational Maintenance Shop remained in the RC enclave.

2.4.1 Fort Chaffee Joint Maneuver Training Center

The FCJMTC was retained and operated by the ARARNG following the 1997 BRAC event as a training installation because of its ideal terrain for training the Army's contingency force pool units and the enhanced brigades, including the 45th Infantry Brigade (Oklahoma ARNG) and the 39th Infantry Brigade (ARARNG). The aerial bombing and gunnery range has the most available combined airspace for ground attack missions within a five-state region (Arkansas, Louisiana, Oklahoma, Montana, and Texas; National Guard Bureau 1995).

The FCJMTC is currently utilized by all DoD components, as well as several local, state, and federal agencies for maneuver training, live-fire exercises, river crossing operations, and urban combat training. It is one of nine National Guard Regional Collective Capability

sites in the U.S. capable of conducting Company Level Maneuver and Platoon Live-Fire training. The extent of the FCJMTC is shown on ***Figure 2-1***. This PA accounted for activities related to Army Actions on this property that took place prior to the 1997 BRAC event.

2.4.2 Fort Chaffee Redevelopment Authority

Approximately 7,000 acres (identified as the BRAC Surplus Property as shown on ***Figure 2-1***) were transferred to the local community following the 1997 BRAC event. The State of Arkansas formed the Fort Chaffee Redevelopment Authority in 1997 with the mission of overseeing the redevelopment of the BRAC Surplus Property for beneficial use and as a revenue generator for the local community. The majority of the BRAC Surplus Property was transferred to the Fort Chaffee Redevelopment Authority. The Fort Chaffee Redevelopment Authority created the Chaffee Crossing area, which consists of commercial, industrial, and residential property use types. Additionally, certain areas were intended for retention of certain community facilities. Any remaining area not allocated for a specific use was converted to parks, passive recreation area, and open space (U.S. Fort Chaffee Base Transition Team 1998).

2.5 Climate

Fort Chaffee weather is affected by the Boston Mountains to the north and its proximity to the Gulf of Mexico. The Boston Mountains allow for cold continental air in the winter, and the proximity to the gulf creates humid summers (ERM 1996). According to the National Oceanic and Atmospheric Administration's National Weather Service, the hottest month in the area occurs during July and ranges in the mid-90s with an average high of 73.8 degrees Fahrenheit (°F). There is an average of only 8.7 days where the temperature exceeds 100°F. The coldest month occurs in January and ranges in the high 20s with an average low of 50.9°F. There is an average of only 2.9 inches of snowfall per year.

Fort Chaffee lies in or near the humid subtropical belt resulting in abundant precipitation (ERM 1996). The area averages 47.34 inches of rainfall a year and 98.2 rainy days. The rainiest time is in the late spring and early summer. Precipitation is distributed throughout the year, with the least precipitation in February and the most in May (U.S. Department of Commerce, National Oceanic and Atmospheric Administration 2022).

2.6 Geology

The physiographic features within Fort Chaffee boundaries were developed by stream erosion on a series of deformed strata as shown on ***Figure 2-2***. The installation is underlain by Pennsylvania age rocks and Quaternary age rocks. The Atoka formation is the oldest, consisting of 7,000 feet of sandstone and shale. It is the surface feature in the southeastern portion of the installation. Above the Atoka formation is the Hartshorne formation, which consists of 200 feet of brown to light gray sandstone. It is the surface feature within the central portion and just north of the southeast corner of the installation. The McAlester formation overlays Hartshorne. It is reported to exceed 1,400 feet. The lower portion of the McAlester formation consists of thick beds of

sandstone and intervening beds of shale. The upper portion consists of alternating beds of sandstone and coal. The McAlester formation is the surface formation found in the western cantonment area, surrounding the central portion of the installation, and north of the Hartshorne surface features in the southeast. The youngest rock formation is the Savanna Sandstone, which is approximately 1,100 feet thick. There are five layers of this formation, ranging from 50 to 200 feet with shale seams between the sandstone layers. It is the surface feature of the eastern cantonment area and the northeast portion of the installation. Alluvial deposits along the Arkansas River yield sand, silt, clay, and occasionally gravel. Depth to bedrock at Fort Chaffee ranges between a few inches and 12 feet deep (Fort Chaffee USAG 1991).

2.7 Topography

The majority of Fort Chaffee lies within the Arkansas Valley, a section of the greater Ouachita Mountain Province. The installation is characterized by gently to moderately rolling hills (***Figure 2-3***). In the southeastern portion of the installation, steep and rugged ridges cut across the reservation in a southwesterly to northeasterly direction. The area is characterized by five physiographic groups. The riparian area to the north, the cantonment area to the west, the well-draining central hills, and the poorly draining Massard Prairie to the northeast, and the well-draining Washburn Mountains in the southeast (Fort Chaffee USAG 1991).

2.8 Hydrogeology

Fort Chaffee is underlain by rocks of Pennsylvanian age and alluvium of Quaternary age. Groundwater is held in the consolidated rocks and in the unconsolidated alluvial and terrace sediments that occur along the Arkansas River and its tributaries (USACE Little Rock District 1999). The hydrogeology in the area consists of a shallow alluvial system with a lower confining shale layer from the Savanna or McAlester formations (ERM 1996). Groundwater throughout the area varies due to the versatility of lithologies in the formations. Some areas have high permeability that can produce about 60 gallons per minute of water and others have low permeability that can produce about 20 gallons per minute of water. Areas with high permeability may be along fractures and areas with low permeability may be along the alluvial deposits (USACE Little Rock District 1999).

Small quantities of water can be obtained from wells 50 to 200 feet deep. Wells in the area do not produce much water due to the consolidated formations (USACE Little Rock District 1999). At around 500 feet the concentration of total dissolved solids begins increasing and does not become ideal for extraction. Six wells exist throughout the property, but the wells are not used for drinking purposes. One well was created during a gas exploration effort and the other five wells were created to retrieve water for vegetable gardens (Fort Chaffee USAG 1991). ***Figure 2-4*** displays the locations of water wells identified through an Environmental Data Resources, Inc. (EDR) survey.

Shallow groundwater system discharges directly to surface streams, drainage ways, and underlaying bedrock aquifers (ERM 1997). The groundwater flow in the area has not been

studied extensively but based off the local topography and groundwater sampling events, it is suggested that flow generally runs south to north.

2.9 Surface Water Hydrology

Multiple bodies of water are located on Fort Chaffee and the surrounding area. There are six streams/creeks that run throughout Fort Chaffee, with the major river being the Arkansas River. The Arkansas River crosses in the norther portion of Fort Chaffee. The six streams, in order from west to east are (ERM 1996):

1. Massard Creek
2. Little Vache Grasse Creek
3. Vache Grasse Creek
4. Flat Rock Creek
5. Big Creek
6. Gin Creek

All streams drain north to the Arkansas River with the exception of Gin Creek that drains south to Washburn Creek. A couple of lakes are located on and around Fort Chaffee as well. This includes Wells Lake, Torians Lake, and No-Name Lake. Bown's Lake, Mendenhall Swamp, Christmas Lake, Engineer Lake, and Darby Lake (ERM 1996). The surface water hydrology for the site is shown on ***Figures 2-2*** and ***2-4***.

2.10 Relevant Utility Infrastructure

The following subsections provide general information regarding the installation's stormwater and wastewater management systems, as well as information on how the utility infrastructures may influence the fate and transport of PFAS at Fort Chaffee.

2.10.1 Stormwater Management System Description

The Fort Chaffee stormwater system consists of culverts, channels, waterways, and streams. Several waterways serve as natural drainage in and around Fort Chaffee. The Little Vache Grasse Creek is the main creek that serves as drainage and runs northeast. Massard Creek also serves as drainage for the western portion of Fort Chaffee and runs northeast (USACE Little Rock District 1999).

The City of Barling maintained the storm drainage system under an Interim Lease Agreement until the approval of the Environmental Impact Statement. Post BRAC, the tenants or owners of the corresponding areas became responsible for maintaining the stormwater collection systems within their individual areas. The stormwater management system was under the management of the City of Barling. The stormwater management system bounded to the land retained for the Maneuver Training Center was under the management of Fort Chaffee (USACE Little Rock District 1999).

2.10.2 Sewer System Description

Fort Chaffee maintained its own sewer system. The sewer system is 63 miles long and consists of a collection system, a sewage lift station, and four bio-oxidation lagoons. From 1942 to the mid-1950s, treated sewage was discharged directly into the Arkansas River. Between the 1950s and 1975 the lagoons were constructed. The four lagoons are unlined and serve to treat the wastewater. Raw wastewater would enter the westernmost lagoons and effluent was discharged from the easternmost lagoons into the Little Vache Grasse Creek. Updates to the sewer system and a designated outfall to the Arkansas River became operational in 1996 (ERM 1996).

The City of Barling maintained the sewer system under an Interim Lease Agreement until the approval of the Environmental Impact Statement. Post BRAC, the tenants or owners of the corresponding areas became responsible for individual service connections (USACE Little Rock District 1999).

2.11 Potable Water Supply and Drinking Water Receptors

An EDR report includes search results from a variety of environmental, state, city, and other publicly available databases for a referenced property. An EDR report was generated for Fort Chaffee, which along with state and county GIS provided by the installation identified several off-post public and private wells within two miles of the installation boundary (***Figure 2-4***). The EDR report providing well search results provided as ***Appendix D***.

Fort Chaffee receives potable water from the City of Fort Smith. It does not utilize any wells on-post for any purpose other than a watering resource for vegetable gardens.

The City of Fort Smith extracts water from Lake Fort Smith in Mountainburg, Arkansas and the Lee Creek Reservoir, Arkansas and is treated by their water treatment plants. The water is delivered to Fort Chaffee through an 18-inch cast iron main. The water comes off the main at a connection on Massard Road and connects to the Fort Chaffee distribution system. Water is then sent to two water storage tanks for storage (ERM 1996).

2.12 Ecological Receptors

The PA team collected information on ecological receptors that was available in the installation documents reviewed. The following information is provided for future reference should the Army decide to evaluate exposure pathways relevant to the ecological receptors.

Generally, the installation lies within the broad southern forest, which stretches along the Atlantic Coastal Plan from southern Virginia down to the top of Florida, westward into the eastern portion of Texas and northward into Oklahoma. The installation is under the influence of two types of native forest regions: the northerly Oak-Hickory Forest and the southerly Oak-Pine Forest (Fort Chaffee USAG 1991). In 1993, a survey of rare and endangered plants and animals was completed for Fort Chaffee. The survey included insects, mollusks, fishes, crustaceans, amphibians, reptiles, mammals, birds, and plants. In this survey, the American burying beetle (*Nicrophorus americanus),* ornate box turtle (*Terrapene ornata ornata*), northern scarlet snake

(*Cemphora coccinea copei*), Bewick's wren (*Thryomanes bewickii*), and eastern harvest mouse (*Reithrondontomys humulis*) were identified. The spadefoot frog (*Scaphiopus holbrookii hurterii*) and Strecker's chorus frog (*Pseudacris streckeri streckeri*) were listed as "should occur at Fort Chaffee." Finally, the southern red-backed salamander (*Plethodon serratus*) was listed as possibly occurring (ERM 1996).

Common primary consumers in the area include the gray fox, gray squirrel, beaver, cottontail rabbit, and whitetail deer. Common secondary consumers include armadillo, opossum, racoon, skunk, mink, muskrat, red and gray foxes, bobcat, coyote, and mixed canids. A 1988 Audubon Christmas Bird count revealed 188 different species found on the installation (Fort Chaffee USAG 1991).

2.13 Previous PFAS Investigations

Previous (i.e., pre-PA) PFAS investigations relative to Fort Chaffee, including those conducted and not conducted by the Army, are summarized to provide full context of available PFAS data for Fort Chaffee. However, only data collected by the Army are used to make recommendations for further investigation.

In response to the USEPA's Third Unregulated Contaminant Monitoring Rule (UCMR3), public water systems (PWS) across the U.S. were sampled for select PFAS compounds, including PFOS and PFOA. The laboratory that analyzed samples under UCMR3 met the USEPA's UCMR3 Laboratory Approval Program application and Proficiency Testing criteria for USEPA Method 537 Version 1.1. The UCMR3 efforts were conducted by the USEPA. Three of these PWSs are adjacent to Fort Chaffee. They all also draw their potable water from surface water sources, rather than groundwater. The Central Water Users Association (PWS identifier AR0000503), located within the northern portion of the installation and northwards, was sampled in January, April, July, and December 2014. The Van Buren Waterworks (PWS identifier AR0000142), located approximately 20 miles north of the installation, was sampled in January, April, July, and December 2015. The Fort Smith Water Utilities (PWS identifier AR0000507), located on the northwestern border of the installation, was sampled in October 2014, January 2015, April 2015, and July 2015. The reporting limit at the time of UCMR3 sampling was 40 ng/L for PFOS, 20 ng/L for PFOA, and 90 ng/L for PFBS, less than or equal to the OSD risk screening levels for tap water. Samples were collected at the entry points of the distribution systems. PFOS, PFOA, and PFBS were not detected in any of these samples. Results from each of these sampling events are provided in ***Table 2-1***.

Table 2-1: UCMR3 Sampling Results

Location		Van Buren Waterworks (AR0000142)			
Sample ID		1501423-001B	1504675-001B	1510142-001A	1507605-001B
Sample Date		1/14/2015	4/15/2015	7/15/2015	10/5/2015
Chemical name	OSD risk screening level* (ng/L)	ng/L	ng/L	ng/L	ng/L
Perfluorooctanoic acid (PFOA)	40	ND	ND	ND	ND
Perfluorobutanesulfonic acid (PFBS)	600	NA	NA	NA	NA
Perfluorooctane sulfonate (PFOS)	40	ND	ND	ND	ND

Notes and Acronyms:
Units are provided in nanograms per liter (ng/L)
* risk screening level for tap water. To be conservative, the OSD tap water risk screening levels will be used to compare all groundwater and potable-use surface water for this Army PFAS PA/SI program.
ND - not detected
NA - not available

2.14 Exposure/Migration Pathways and Targets

The evaluation of potential exposure and migration pathways and the resulting targets (i.e., receptors) for PFAS in soil, surface water, groundwater, and/or air for the potential AOPIs at the site is presented below.

2.14.1 Soil Exposure Pathways and Targets

The use of PFAS containing material at the site is known to have occurred at one or more AOPIs at the site. The primary source of known PFAS impacts for the site is AFFF and it is reported to have been used and potentially released to the ground surface at the Original Fire Training Area and New Fire Training Area. Additionally, AFFF may have been released to the ground surface as part of routine training (e.g., nozzle training) at fire stations and at current and former airfield locations. Additional areas of potential PFAS impacts to soil include the former land application sites (where soil from the Original Fire Training Area were deposited), and disposal lagoons. The PFAS impacts to soil may remain present near the AOPIs (described further in Section 5.1) and may present exposure pathways for direct contact. Potentially affected targets include nearby residents, commercial workers, and potential construction workers as described below:

- Residential targets living near the two former fire training areas and the former Airfield Fire and Rescue Station. Impacts to surficial soil are potentially present at the former fire station and training areas, which are located 200 feet south or east of a residential neighborhood. Access to these areas were uncontrolled at the time of the PA. Additionally, the property containing the former fire training area may be redeveloped in the future and would also present a potential exposure scenario for construction workers and/or commercial workers.
- Non-ARARNG commercial targets working at BRAC excess areas that are being used as commercial business may encounter PFAS-impacted surface soil from former fire

training areas, the former Airfield Fire and Rescue Station, a former helipad, and the former airfield area.

- ARARNG personnel and contractors (i.e., commercial worker targets) working on the active Fort Chaffee installation may encounter PFAS-impacted surface soil from former training activities (e.g., nozzle testing) at current and former fire stations, at the two landing strips, and at former helipads.

2.14.2 Surface Water Migration Pathways and Targets

A well-developed surface water drainage system is present at the site as detailed in ***Section 2.9***. All surface water in the area eventually drains to the Arkansas River or into the underlying shallow and bedrock aquifers. Surface water at the site has potential to be an exposure and migration pathway as precipitation drains over and through potential surface soil impacts and enters the intermittent drainages. Potential surface water exposures are possible on-post and off-post as surface water originating on the site exits Fort Chaffee and/or the BRAC surplused areas potentially containing PFAS impacts to surface soil.

Targets for potential surface water impacts on-post include site workers who may rarely access intermittent surface water bodies for maintenance activities. Off-post targets include workers, residents, and recreational users that may enter the intermittent surface water drainages or surface water bodies (e.g., Arkansas River) as off-post access is uncontrolled.

2.14.3 Groundwater Migration Pathways and Targets

Shallow groundwater is present at the site and is potentially impacted by releases of PFAS containing materials from soil at the AOPIs. Shallow groundwater flow for the area of Fort Chaffee is generally to the north, with localized differences in flow direction due to topography.

Groundwater is not used as a drinking water source at Fort Chaffee or for most of the surrounding area, which is supplied with drinking water from distant reservoirs. However, there are water wells (e.g., domestic, livestock, irrigation, etc.) present around Fort Chaffee, as shown on ***Figure 2-4***, including several reported domestic wells are present in the BRAC Surplus area. The potential users of these wells may represent targets for ingestion.

2.14.4 Air Migration Pathways and Targets

PFAS impacts in soil or surface water present from pre-BRAC event releases are unlikely to volatize and/or migrate through air under normal atmospheric pressure, pH, and temperatures. A potential may exist for surficial soil with PFAS impacts to dry and become airborne as dust at the release point (e.g., a fire training area exposed to AFFF). Such potential exposure pathways would be limited to the potential release areas and the potential targets would include residents for the AOPIs located on BRAC surplus areas adjacent to residential housing areas and commercial workers and construction workers that may be working near potential release areas.

Figure 2-1: Site Location

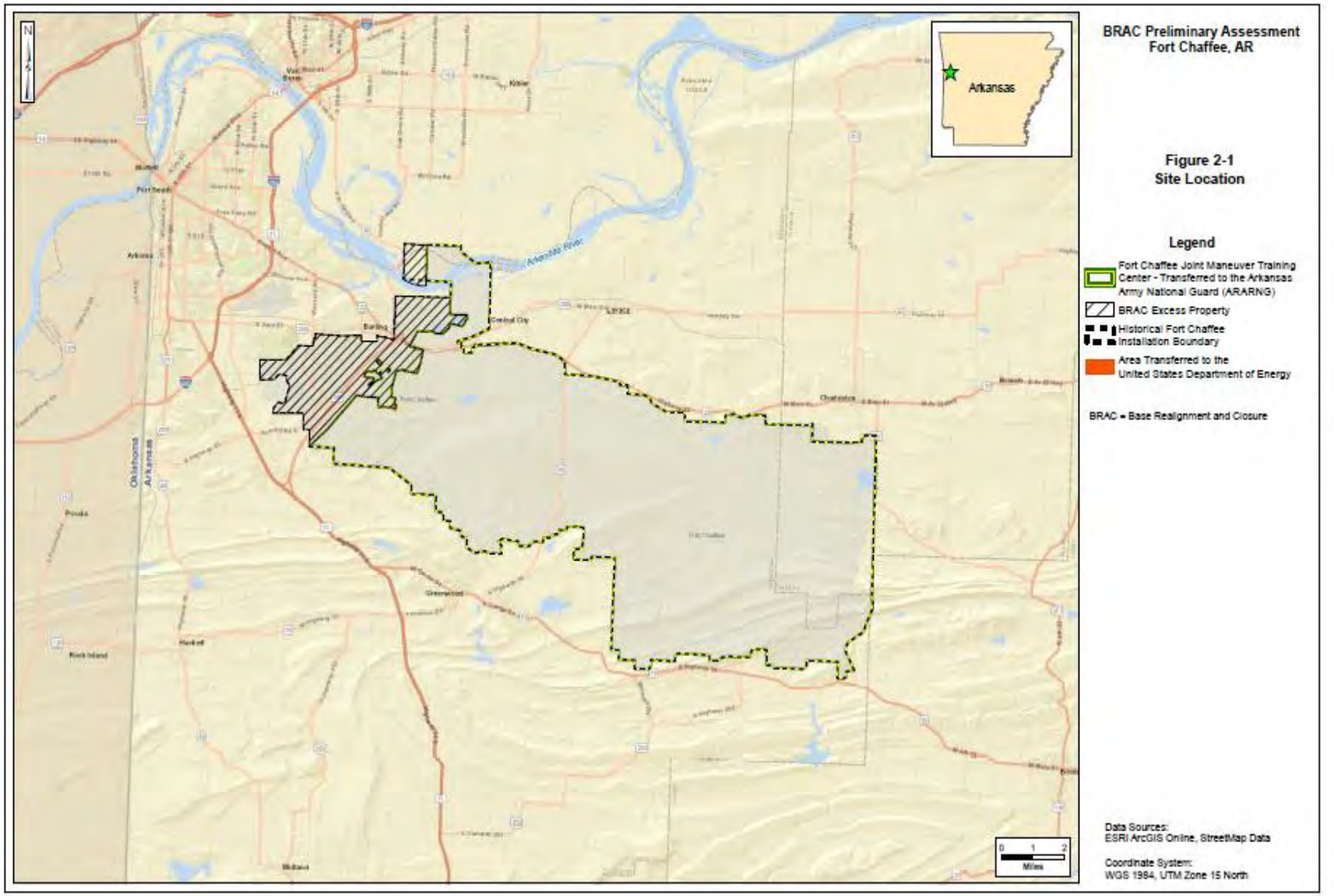


Figure 2-2: Site Layout

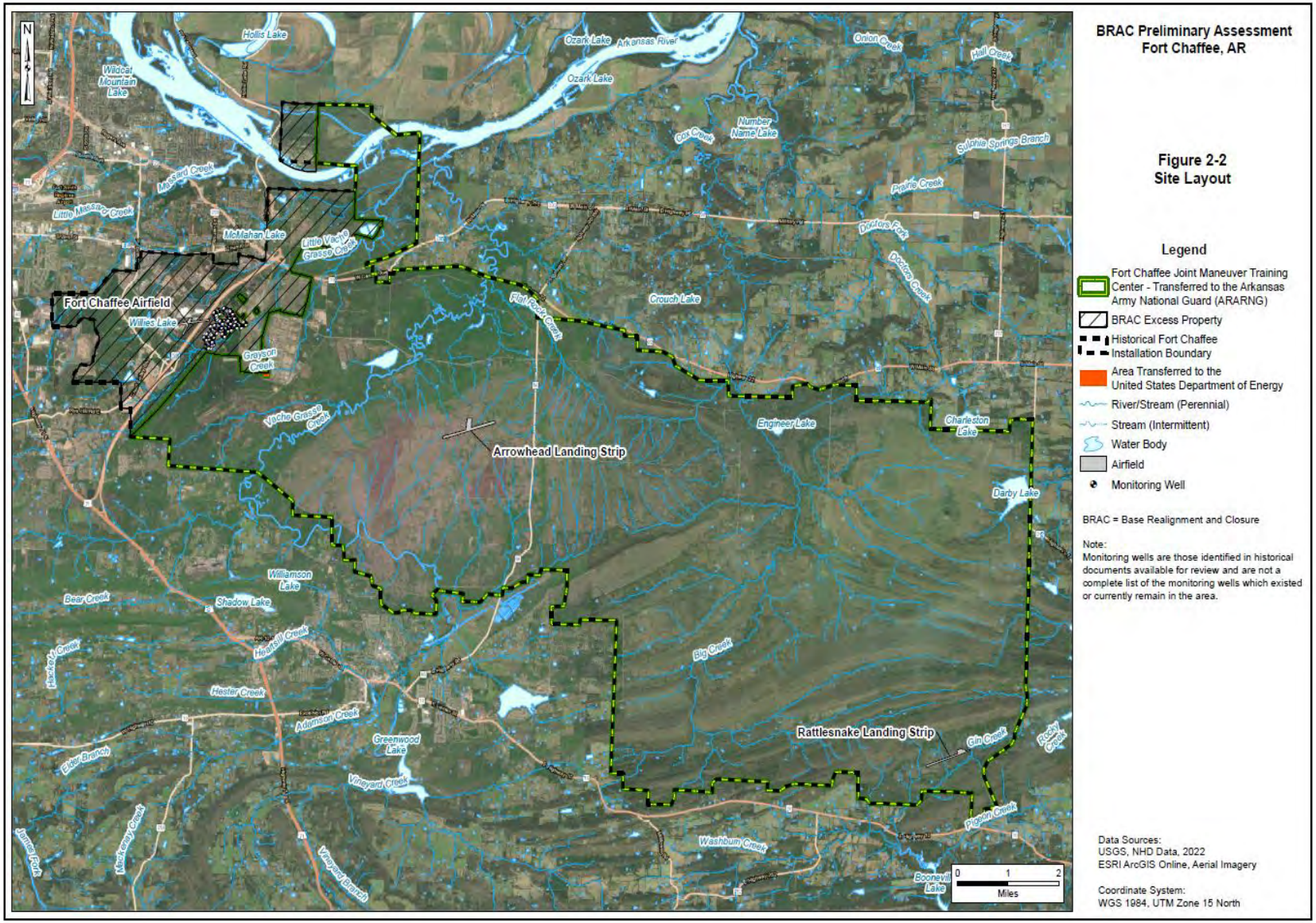


Figure 2-3: Topographic Map

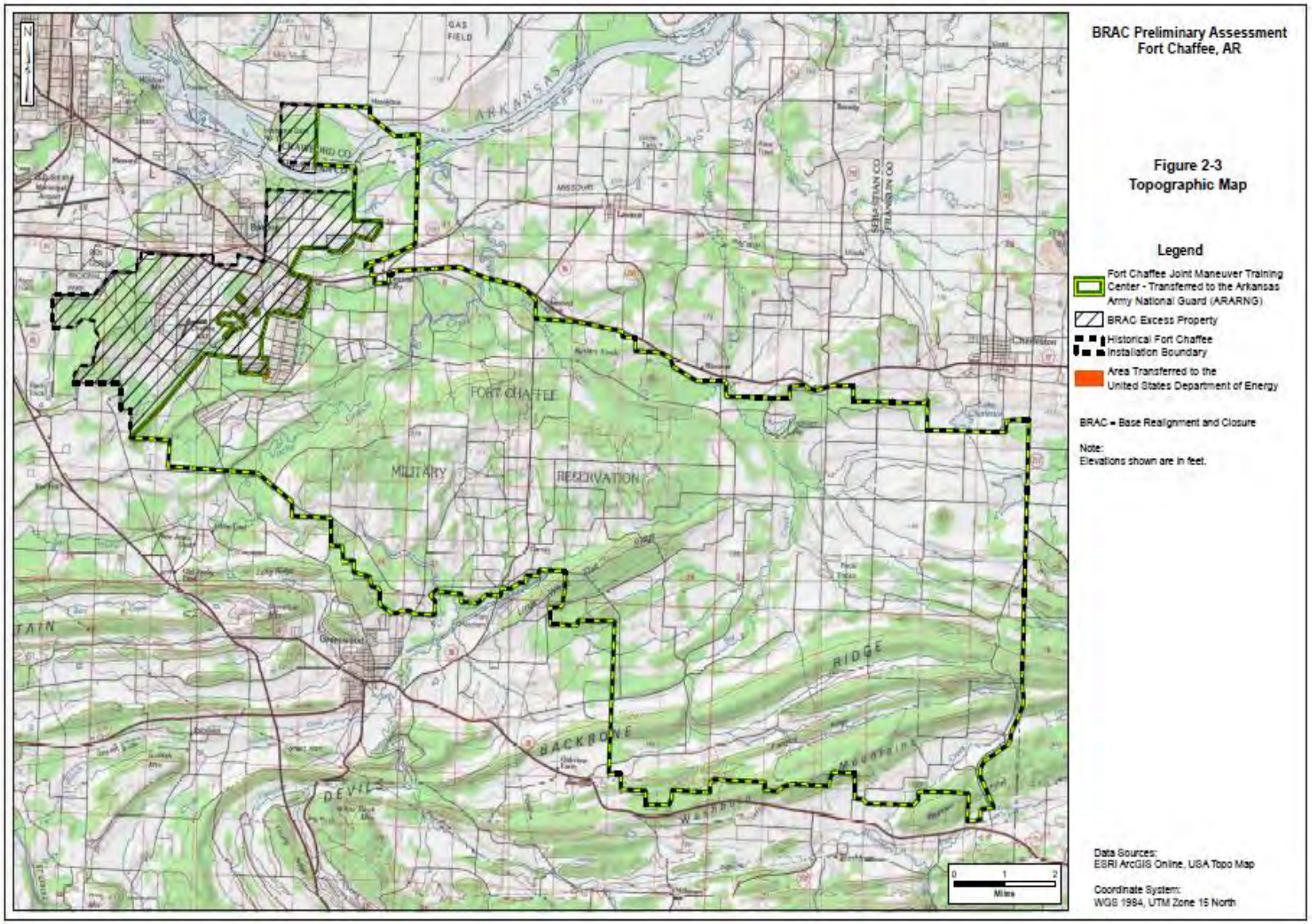
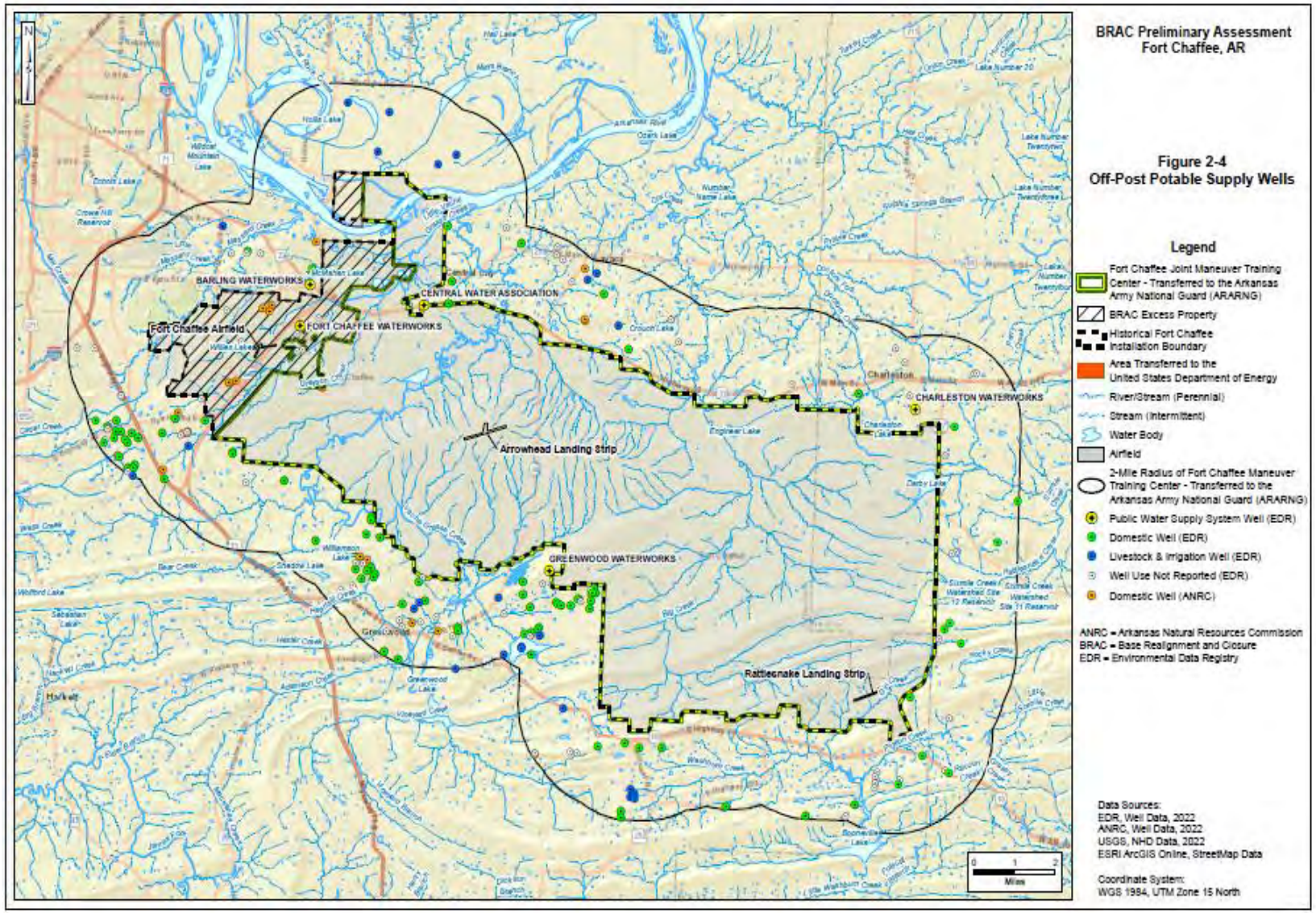


Figure 2-4: Off-Post Potable Supply Wells



3.0 SUMMARY OF PA ACTIVITIES

To document areas where any potential current and/or historical PFAS-containing materials were used, stored and/or disposed at Fort Chaffee, data were collected from three principal sources of information:

1. Records review,
2. Personnel interviews, and
3. Site reconnaissance.

These sources of data, along with their relative application to this PA, are discussed below. The specific findings of records review, personnel interviews, and site reconnaissance relevant to PFAS-containing materials at Fort Chaffee are described in **Section 4**.

3.1 Records Review

The records reviewed for this PA included, but were not limited to, various Installation Restoration Program administrative record documents, compliance documents, Fort Chaffee, and the City of Barling fire department documents, Fort Chaffee directorate of public works documents, and GIS files. Internet searches were also conducted to identify publicly available and other relevant information. A list of the specific documents reviewed for Fort Chaffee is provided in ***Appendix F***.

3.2 Personnel Interviews

Interviews were conducted during the PA site visit.

However, in the 25 years since the 1997 BRAC transfer event, most DoD personnel associated with the Active Army at Fort Chaffee had transferred to alternate assignments and/or retired or have passed away. Therefore, interviewees with recollections of historical site activities were typically unavailable. Additionally, the Active Army records from Fort Chaffee were transferred offsite and pre-1997 environmental records were not available. The list of roles for the installation personnel interviewed during the PA process for Fort Chaffee is presented below (affiliation is with Fort Chaffee unless otherwise noted).

- Barling Fire Chief
- Fort Smith Fire Chief
- ARARNG FCJMTC Environmental Program Manager
- ARARNG FCJMTC Fire Chief
- ARARNG FCJMTC Former and Current Range Control Officer
- ARARNG FCJMTC Range Support
- Former Fort Chaffee Site Manager
- Fort Chaffee Redevelopment Authority, Chaffee Crossing Director of Finance
- Fort Chaffee Redevelopment Authority, Chaffee Crossing Contracts Support
- Fort Chaffee Redevelopment Authority, Chaffee Crossing Executive Director

The compiled interview logs provided in ***Appendix F***.

3.3 Site Reconnaissance

Site reconnaissance and visual surveys were conducted at the preliminary locations identified at Fort Chaffee during the records review process, the installation in-briefing, and/or during the installation personnel interviews. A photo log from the site reconnaissance is provided in ***Appendix G***; photos were used to assist in verification of qualitative data collected in the field. The site reconnaissance logs are provided in ***Appendix H***.

Access to existing groundwater monitoring wells, if present, were also noted during the site reconnaissance in case the monitoring wells could be proposed for future sampling. The infrastructure of Fort Chaffee has changed dramatically across its history, continuing after BRAC event land transfers. Much of the installation's infrastructure was left in disrepair before the recommendation for transfer. Furthermore, land which was redeveloped under the Fort Chaffee Redevelopment Authority may be dramatically different than historically presented.

Preliminary locations of potential use, storage, and/or disposal of PFAS-containing materials were then evaluated in the PA (during records review, personnel interviews, and/or site reconnaissance) and were categorized as AOPIs or as areas not retained for further investigation at this time based on a combination of information collected (e.g., records reviewed, personnel interviews, internet searches). A summary of the observations made, and data collected through records reviews (***Appendix F***), installation personnel interviews (***Appendix F***), and site reconnaissance logs (***Appendix H***) during the PA process for Fort Chaffee is presented in **Section 3**. Further discussion regarding rationale for not retaining areas for further investigation is presented in **Section 5.2**.

4.0 POTENTIAL PFAS USE, STORAGE, AND/OR DISPOSAL AREAS

Fort Chaffee was evaluated for all potential current and historical use, storage, and/or disposal of PFAS-containing materials. There are a variety of PFAS-containing materials used in relation to current and historical Army operations. However, the use, storage, and/or disposal of AFFF is the most prevalent potential source of PFAS chemicals at DoD facilities. As such, this section is organized to summarize the AFFF-related uses first, and all remaining potential PFAS-containing materials in the subsequent sections.

4.1 AFFF Use, Storage, and Disposal Areas

AFFF was developed in the mid-1960s in response to a need for firefighting foams better suited to extinguish Class B, fuel-based fires. AFFF formulations consist of water, an organic solvent, up to 5 percent (%) hydrocarbon surfactants, and 1 to 3% PFAS (ITRC 2020). AFFF concentrate is designed to be diluted with water to become a 1, 3, or 6% foam. AFFF releases at DoD facilities may have occurred during firefighter training, emergency response actions, equipment testing, or accidental releases. The military still primarily uses AFFF for Class B fires; however, the current formulations of AFFF contain significantly lower amounts of PFOS, PFOA, and their precursors, and significant operational changes have been implemented to restrict uncontrolled releases and non-essential use of PFAS-containing foams. Army installations may still house AFFF, commonly stored in closed containers (e.g., 55-gallon drums, 5-gallon buckets), within designated storage buildings or at firehouses.

As described in **Section 3.2**, due to the time interval since the 1997 BRAC event, interviewees with recollection of historical site activities not typically well documented in environmental records, like AFFF or even general firefighting foam inventory data were not available. However, the timeline of firefighting activities, the types of firefighting activities, and commonly known firefighting behaviors provide contextual insight on the types of foam being utilized.

Emergency preparedness procedures practiced by the Fort Chaffee Fire Department regarding nozzle testing (spraying AFFF through fire equipment to ensure proper consistency and flow of extinguishing material; avoiding blockages), wetlining (spraying diluted concentrations of AFFF or AFFF through a foam nozzle device to prevent the spread of fires) or arc training (training to maximize the arc, reach, and distance covered by AFFF) were not available through interviews or document review. However, a 1995 interview with the Fort Chaffee Fire Chief, conducted as part of the ERM Environmental Baseline Study, shows that the Fire Department would occasionally respond to flammable material spills (ERM 1996). The response actions were not specified, although AFFF is commonly used by firefighting departments to prevent combustion or ignition of fuel-based spills. However, no records of Fire Department spill response procedures or records of where they may have responded to spills have been identified. The Environmental Baseline Survey Report indicates that minor petroleum-based spills (e.g., used oil, gasoline, jet fuel, diesel, hydraulic fluid) occurred at all oil houses, fueling stations, used oil storage facilities, gasoline storage buildings, and the Motor Pool at Building 470. It is unknown

whether the Fort Chaffee Fire Department responded to these or utilized AFFF when responding to them.

Firefighting training activities were confirmed to have occurred at the two firefighter training areas which were collocated on Fort Chaffee as shown on ***Figure 5-3***. The Fort Chaffee Fire Department would train here in addition to neighboring fire departments (e.g., 188th Tactical Fighter Group based in Fort Smith, Arkansas) according to an interview. The Original Fire Training Area, identified as FTCH-022, was constructed between 1971 and 1980, according to historical aerials. Flammable liquids were routed from a fuel storage tank to two pits, ignited, an extinguished with “fire suppression chemicals”. Used oil from across the installation was also burned here; stored in a fuel storage bin. A 500-gallon "fire training pit fuel truck” serviced the area. Soil was removed in a 1990 removal action and reportedly land applied to remediate petroleum hydrocarbon impacts at the East and West Land Application Areas (FTCH-043 and FTCH-044). The new fire training area was completed in the early 1990s; considered to be a more “environmentally friendly” setup. It also had a fuel storage tank. An aircraft hull and lined containment area would be filled with flammable materials and used for fuel-based firefighter training. Piping from the aircraft hull containment area conveyed overflow fuel and extinguishing media to a lined overflow weir and then to an oil/water separator. It is unclear whether this oil/water separator was connected to the sanitary sewer system.

Records at Fort Chaffee indicate that there were six fire stations built at Fort Chaffee in its history. These fire stations were built in the early 1940s. These were the Northeast Cantonment Area Fire Station (Building 1852), Hospital Area Fire Station (Building 3799), Central Cantonment Area Fire Station (Building 139), Primary Fire Station (Building 2100), Fire Station and Warehouse (Building 2360), and the Airfield Fire and Rescue Station (B5850; USACE Little Rock District 1990). By 1996, only Building 2100 and the Airfield Fire and Rescue Station remained in operation (ERM 1996). At the time of closure, a third fire station was reportedly active, but the location was not identified and there were no interviewees available with living memory of fire station utilization prior to the 1997 BRAC event. The large number of fire stations present at Fort Chaffee can be attributed to the heightened level of fire department support required for the primarily wooden infrastructure comprising the cantonment area. It is possible that not all of these buildings had the purpose or capability to respond to Class B fires and may not have had AFFF stored or used there. However, records and interviewees were not available to confirm this information.

The Airfield Fire and Rescue Station (Building 5850) has been used as recently as 1990, but the building was reported to be in substandard conditions (USACE Little Rock District 1990). The Airfield Fire and Rescue Station is located in the BRAC Surplus Property area, in the former western cantonment area, adjacent to the firefighter training area. There was one chemical additive pumper listed in a site inventory and described as having been housed primarily here until closure and transfer. This chemical additive pumper may have utilized AFFF.

The Primary Fire Station (Building 2100) is the original fire station for Fort Chaffee and originally had capacity for three firefighting vehicles when constructed in 1943. The fire station has undergone several additions, including a new storage building and extended garage. One heliport was located south of the building, in a large field, near a fire hydrant. Tire tracks from historical aerials indicate that access to the heliport was made from the Primary Fire Station. This building was utilized as a fire station until the 1997 BRAC closure event when fire services were contracted to the City of Barling, Arkansas. Upon closure, the majority of fire trucks were excessed. Two fire trucks were kept at this building. One fire truck of unknown foam-carrying capability was sold sometime in 2010. The remaining truck has Class A foam capability. This building was subsequently chosen as the fire station headquarters for the FCJMTC when the ARARNG re-established their own firefighting services in approximately 2007. Following the 1997 BRAC event, a satellite building to this fire station was constructed nearby. A fire station storage building was constructed for crash equipment storage in 2014. There are no records of the FCJMTC Fire Department having ever had AFFF in their inventory.

The Central Cantonment Area Fire Station (Building 139) had capacity to hold two firefighting vehicles when constructed in 1942. No detailed records on the operation of this building exist, and no interviewees were familiar with pre-BRAC fire department operations, so limited knowledge on the possibility for the use or storage of AFFF at this facility exists. It is known, however, that a heliport was located in close proximity to this fire station to the northeast.

The Fire Station and Warehouse (Building 2360) was constructed in the early 1940s. The building was utilized as a fire station and warehouse, but it is unclear when the building transitioned to warehouse use. However, it appears on a 1998 Building Assignment List as having been renovated in 1992. Therefore, it is assumed that the building was utilized as a fire station until 1992 The building was subsequently demolished as it no longer appears in aerial photographs between 1994 and 2001.

The Northeast Cantonment Area Fire Station (Building 1852) was constructed in 1942 and located amongst barracks. It was destroyed in a 2008 fire.

Hospital Area Fire Station (Building 3799) was constructed in 1942. Very little information could be gathered about this building. The Hospital Area, which was located in the cantonment area, comprised of 122 buildings, and covering 75 acres, was generally in disrepair as late as the early 1990s (USACE Little Rock District 1990). A 1998 survey of the area stated that these buildings, including the Hospital Area Fire Station, were in such poor and unsafe conditions, that demolition of these buildings was recommended (Fort Chaffee Public Trust 1998).

For emergency preparedness, fire department personnel may be trained to perform nozzle testing with AFFF to ensure optimal flow and use of the AFFF mixture. Nozzle testing involved spraying AFFF through fire equipment. Fire equipment training also can include arc training to maximize the arc, reach, and distance covered by AFFF in an emergency response. Emergency responses are not well documented in Fort Chaffee records. A photo album of Fort Chaffee Fire

Department ongoings was identified during the PA site visit, displaying charred remains of several vehicle fires, where Class B firefighting foam is likely to have been expended. However, no locational data or confirmation of foam type was provided along with this information.

Upon completion of the 1997 BRAC event, the City of Barling Fire Department was contracted to establish a station and equipment presence at Fort Chaffee, providing fire protection support until approximately 2007, when FCJMTC would instate its own Fire Department (U.S. Army Training and Doctrine Command 1995, Fort Chaffee Public Trust 1998). The Barling Fire Department did not possess or utilize any equipment that had Class B foam capabilities based on an interview with the Barling Fire Chief.

The Fort Chaffee Airfield, located in the BRAC Surplus Property as shown on ***Figure 5-4***, like the Airfield Fire and Rescue Station, was used as recently as 1990. It was an unpaved runway, used exclusively by rotary winged aircraft. Maintenance hangars for this airfield were converted from World War II motor pool buildings (USACE Little Rock District 1990).

The Arrowhead Landing Strip is a 4,500-foot-long earthen landing strip used by military aircraft. Training exercises occurred here regularly throughout the JRTC mission and prior to the 1997 BRAC event. An interviewee stated that nozzle testing was completed at unspecified location at the landing strip as part of routine operations. Presently, the FCJMTC Fire Department reports to this location on standby, along with ARARNG firefighting equipment from Little Rock, Arkansas if fire response support is required. Fort Chaffee does not presently possess fire trucks with Class B foam support capability. Little Rock ARARNG pumper trucks feature AFFF capabilities and the FCJMTC Fire Department fire trucks provide water capacity for additional assistance, if needed. According to interviews, foam response has not occurred at this landing strip since the installation was transferred to the ARARNG. However, records related to potential foam response records during the time that JRTC was on-post prior to the 1997 BRAC event occurred remain a data gap.

The Rattlesnake Landing Strip is an earthen landing strip developed for military aircraft training exercises and was likely operated similarly to the Arrowhead Landing Strip. However, foam response records during the time that JRTC was on-post remain a data gap.

Vehicle wash racks across the installation were processed through oil/water separators, which would flow through the sanitary wastewater line to the Sewage Treatment Lagoons (FTCH-011). Fire trucks, after having used AFFF, would likely be washed at wash racks, resulting in a release to the sanitary system or the area surrounding the wash rack. There is a wash rack located at Building 5866; it is closest to the Airfield Fire and Rescue Station. The wash racks were mostly installed in 1975. Although the majority of oil/water separators were determined to be inoperative by 1988, it could have been used for washing fire trucks until BRAC was completed. Prior to the installation of oil/water separators in these wash racks, discharge from the vehicle wash racks would be routed to Vehicle Wash Rack Drainage Ditches (FTCH-017).

Used between 1975 and 1983, the Oil/Water Separator Sludge Disposal Area (FTCH-033) was used for oily debris which clogged up the wash racks. The material collected from the wash rack area was not from the oil/water separator as indicated in the name, but instead from the concrete wash basin itself. Material was spread on the ground surface.

Four sewage lagoons (FTCH-011) were installed in the northern portion of the installation between 1967 and 1995. They process sanitary sewer waste across the installation and discharge into the Arkansas River Contributions to the system include wastewater from the FTCH-025 Troop Medical Clinic Recovery Unit (1985-1990). All wash racks from the installation were routed here following oil/water separator processing after being routed through the Sewage Pumping Station (FTCH-031). Wastewater from the New Firefighter Training Area oil/water separator may have been routed here, but the connectivity of this utility is unconfirmed.

East and West Land Application Sites (FTCH-043 and FTCH-044) received petroleum-impacted soils excavated during the removal of petroleum impacted soils from the former Fire Training Area in 1990. Soil was treated biologically using a landfarming technique.

4.2 Other PFAS Use, Storage, and/or Disposal Areas

Following document research, personnel interviews, and site reconnaissance at Fort Chaffee, former ANG burn pit, silver recovery unit, x-ray and photo film generators, vehicle wash rack drainage ditches, sewage pump stations, potential fuel spill locations, as well as pesticide storage and handling buildings were identified and reviewed as potential PFAS use, storage, and/or disposal areas. A summary of information gathered in the PA for each of these preliminary locations is described below. Specific discussion regarding areas retained as AOPIs is presented in **Section 5.1** and specific discussion regarding areas not retained for further investigation is presented in **Section 5.2**.

Potential PFAS use associated with metal plating activities may also be relevant to Army installations. During metal plating operations, a metal surface may be treated with a layer of electrochemically deposited metals in an acid bath. PFAS, specifically PFOS, have been used in metal plating operations as surface tension-reducing wetting agents to mitigate the release of aerosolized chemicals into a working environment. Hard chromium plating is one type of metal plating operation where PFAS-containing mist suppressants were commonly used. Historically, it was common for spent plating baths from metal plating operations to be disposed of in a lined or unlined pit or into a sanitary or storm sewer. Therefore, PFAS present in mist suppressants during the metal plating process could be released to the environment. However, no evidence of metal plating was identified to have occurred at Fort Chaffee during the PA.

Fluorinated surfactants have been used as antifoaming agents in silver halide photographic processing solutions in order to eliminate air bubbles that can cause failure in image transfer (Gluege et al. 2020). Building 130, the Troop Medical Clinic Silver Recovery Unit (FTCH-025) recovered silver from x-ray films from various buildings across the installation. Although no safety data sheets were available for review, the silver being recovered may have been in a

solution which contained PFAS. The photochemical solution discharged through a filter to the sanitary sewer which went to the sewage treatment lagoons that led to the Arkansas River. The unit was removed in 1990. After 1990, the processing of x-rays was completed in X-Ray Processing (Building 1340), where all developer was collected and picked up by Fort Chaffee Environmental Branch until BRAC 1995. This included the Former Dental Clinic (Building 1313), Current Troop Medical Clinic (Building 1339), Former Dental Clinic (Building 1393), Photo Lab (Building 2051), and Hospital Area (Building 3261). These areas all collected and developed either x-rays or film photographs. Waste was collected in jugs and then sent to FTCH-025 - Troop Medical Clinic Silver Recovery Unit to capture generated silver. No spills were reported. As activities were conducted inside buildings, any unreported spills would not be absorbed into media (Directorate of Resource Management BRAC 1996).

Sulfuramid, flursulamid, novaluron, nifluiridide, and lithium PFOS are among several insecticides which are formulated with PFAS. The Army PA team reviewed available pesticide use inventory documentation provided by the installation and did not identify PFAS-containing pesticides use, storage, or disposal. Further discussion regarding areas not retained for further investigation is presented in **Section 5.2**.

4.3 Readily Identifiable Off-Post PFAS Sources

An exhaustive search to identify all potential off-post PFAS sources (i.e., not related to operations at Fort Chaffee) is not part of the PA. However, potential off-post PFAS sources within a 5-mile radius of the installation that were identified during the records search and site visit are described below.

The City of Fort Smith has three sewage treatment facilities between one and three miles northwest of the former Fort Chaffee installation boundary. Further, two Fort Smith sanitary landfills sit less than a mile west of the installation. Owens Corning Non-Woven Tech and Glatfelter Advanced Materials are nonwoven fabric mills located less than a mile west of the installation. Nonwoven fabric mills may use and release PFAS in the fabrication of their materials.

Industrial Oils Unlimited, LLC is a manufacturer of petroleum lubricating oil and grease. This type of manufacturing may utilize or produce materials which contain PFAS. It is located less than three miles west of the installation.

Calvert McBride Printing, Inc. is a commercial printer. Printing activities (excluding screen and book printing) may utilize or produce materials which contain PFAS. It is located less than three miles west of the installation.

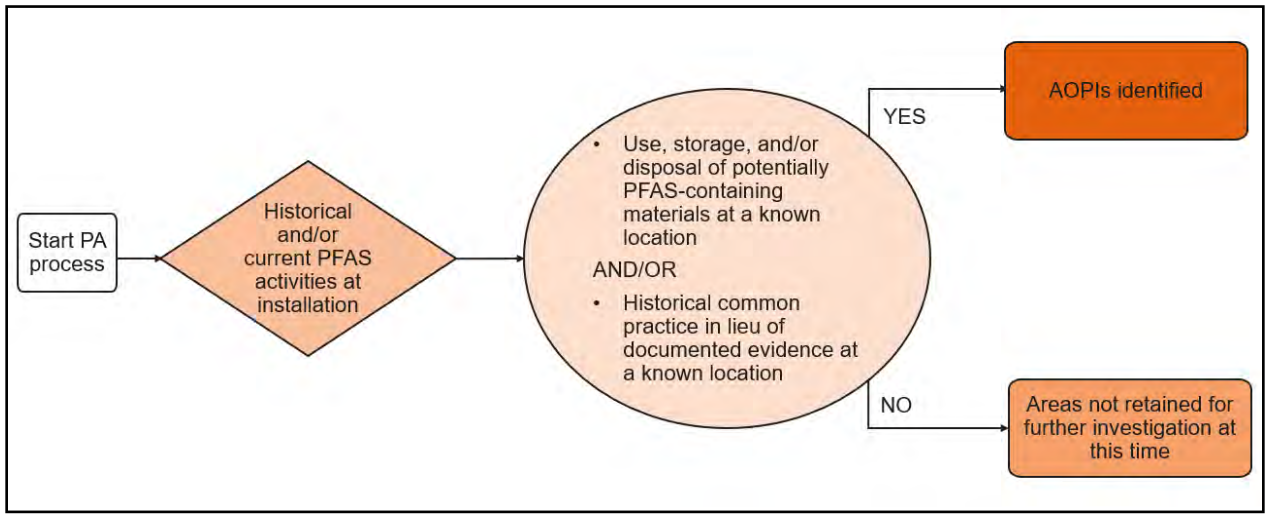
Industrial Plastics Company is an unlaminated plastics films and sheet manufacturer, creating unsupported plastics film and sheet (except packaging). This type of plastics manufacturing may utilize or produce materials which contain PFAS. It is located less than three miles west of the installation.

Fort Smith Municipal Airport was at one point required to use AFFF as part of its Federal Aviation Administration Part 139 Airport Certification. It is located approximately two miles west of the installation.

5.0 SUMMARY AND DISCUSSION OF PA RESULTS

The preliminary locations evaluated for potential use, storage, and/or disposal of PFAS-containing materials at Fort Chaffee, were further refined during the PA process and identified either as an area not retained for further investigation or as an AOPI. In accordance with the established process for the PA, 21 areas have been identified as AOPIs on ***Figure 5-1***, below.

Figure 5-1: AOPI Decision Flowchart



The areas not retained for further investigation are presented in **Section 5.2**.

Data limitations for this PA at Fort Chaffee are presented in **Section 6**.

5.1 AOPIs

Overviews for each of the 19 AOPIs identified during the PA process are presented in this section. The AOPI locations are shown on ***Figure 5-2***. Aerial photographs of each AOPI that also show the approximate extent of AFFF use (if applicable) are presented on ***Figures 5-3*** through ***Figures 5-19***.

5.1.1 Original Fire Training Area (FTCH-022)

The Original Fire Training Area (FTCH-022) is identified as an AOPI following records research, personnel interviews, and site reconnaissance. The Original Fire Training Area is collocated with the New Fire Training Area. Together, they represent two generations of fire training areas as shown on ***Figure 5-3***. Firefighting training activities were confirmed to have occurred here. The Fort Chaffee Fire Department would train here in addition to neighboring fire departments (e.g., 188th Tactical Fighter Group based in Fort Smith, Arkansas) according to an interview. This training area first appeared between 1971 and 1980 and was comprised of two unlined deep earthen pits located to the southeast of the parcel (***Figure 5-3***). Flammable liquids were routed from a fuel storage tank to the pits, ignited, an extinguished with "fire suppression

chemicals." Used oil from across the installation was also burned here; stored in a fuel storage bin. A 500-gallon "Fire Training Pit Fuel Truck" serviced the area. Soil was removed in 1990 removal action and reportedly land applied to remediate petroleum hydrocarbon impacts at the East and West Land Application Areas (FTCH-043 and FTCH-044).

An aerial photograph of the Original Fire Training Area is provided on ***Figure 5-3***. The Original Fire Training Area is located on a grassy field with variability in elevation. Runoff flows north towards the drainage ditches located along Custer Boulevard. Drainage ditches run from west to east.

This area was transferred to private ownership with no restrictions imposed.

5.1.2 New Fire Training Area

The New Fire Training Area was constructed to replace the Original Fire Training Area (FTCH-022). Together, they represent two generations of fire training areas as shown on ***Figure 5-3***. The Fort Chaffee Fire Department would train here in addition to neighboring fire departments (e.g., 188th Tactical Fighter Group based in Fort Smith, Arkansas) according to an interview. Flammable liquids were routed from a fuel storage tank to the pits, ignited, and extinguished with "fire suppression chemicals". Used oil from across the installation was also burned here; stored in a fuel storage bin kept to the west of the pit. The new fire training area was completed in the early 1990s; considered to be a more "environmentally friendly" setup. An aircraft hull and lined containment area would be filled with flammable materials and used for fuel-based firefighter training. Piping from the aircraft hull containment area conveyed overflow fuel and extinguishing media to a lined overflow weir and then to an oil/water separator. It is unclear whether this oil/water separator was connected to the sanitary sewer system.

An aerial photograph of the New Fire Training Area is provided on ***Figure 5-3***. The New Fire Training Area is located on a grassy field with variability in elevation. Runoff flows north towards the drainage ditches located along Custer Boulevard. Drainage ditches run from west to east.

This area was transferred to private ownership with no restrictions imposed.

5.1.3 Airfield Fire and Rescue Station (Building 5850)

The Airfield Fire and Rescue Station (Building 5850) is identified as an AOPI following records review due to possible nozzle testing, vehicle maintenance and washing, and AFFF storage being conducted here. Building 5850 was constructed in 1943 and is located in the Western Cantonment Area. This building was utilized as a fire station until the 1997 BRAC event at Fort Chaffee and was described as being in very poor condition. At the time of this PA the building still stands. Various records also describe it as a vehicle maintenance building.

This fire station is the closest to the Original Fire Training Area (FTCH-022), New Fire Training Area, and the Fort Chaffee Airfield. Records show that it was named the "Airfield Fire Fight and

Rescue Building". One chemical additive pumper was listed as a firefighting support vehicle and primarily housed here. One wash rack is located south of the building near Building 5866, where fire response vehicles could have been washed. An aerial photograph of the Airfield Fire and Rescue Station is provided on ***Figure 5-4***.

This area was transferred to private ownership with no restrictions imposed.

5.1.4 Primary Fire Station (Building 2100)

The Primary Fire Station (Building 2100) is identified as an AOPI following records review, personnel interviews, and site reconnaissance due to possible nozzle testing and AFFF storage being conducted here. The Primary Fire Station is located at Building 2100 and was constructed in the early 1940s and located in the Eastern Cantonment Area (***Figure 5-5***). It is currently utilized by the ARARNG. At the time of closure, Fort Chaffee had one pumper, one tanker, two brush trucks, one rescue truck, one chemical foam additive pumper, and hazardous material response equipment. The chemical foam additive pumper was housed primarily at the Airfield Fire and Rescue Station but was here for some amount of time. It is not indicated whether the chemical foam used with this pumper was Class B, but as it was used primarily at the Airfield Fire and Rescue Station, it is assumed to be AFFF. It was near one of the installation heliports, which was installed between 1971 and 1980 and used as part of the JRTC training mission. An aerial photograph of the Primary Fire Station is provided on ***Figure 5-5***.

This area was transferred to Arkansas Army National Guard (ARARNG) with no restrictions imposed.

5.1.5 Central Cantonment Area Fire Station (Building 139)

The Central Cantonment Area Fire Station (Building 139) is identified as an AOPI following records research and site reconnaissance due to possible nozzle testing and AFFF storage being conducted here. Located in Building 139, it was constructed in 1942 and located in the Central Cantonment Area (***Figure 5-6***). It had capacity for two firefighting vehicles. The fire station was near one of the installation heliports, which was installed between 1971 and 1980 and used as part of the JRTC training mission. The final date of use as a fire station is unknown; however, it was not actively used as a fire station by the time of the 1997 BRAC event. An aerial photograph of the Central Cantonment Area Fire Station is provided on ***Figure 5-6***.

This area was transferred to Ft. Chaffee Redevelopment Trust with no restrictions imposed.

5.1.6 Fire Station and Warehouse (Building 2360)

The Fire Station and Warehouse (Building 2360) is identified as an AOPI following records review due to possible nozzle testing and AFFF storage being conducted here. Located in Building 2360, it was constructed in the early 1940s and located in the Eastern Cantonment Area (***Figure 5-7***). The building was utilized as a fire station and warehouse. It is unclear when the

building was transitioned to a warehouse. However, it appears on a 1998 Building Assignment List as having been renovated in 1992. Therefore, it is assumed that the building was utilized as a fire station until 1992. The Fire Station and Warehouse is not visible in historical aerials between 1994 and 2001 and is assumed to have been demolished. An aerial photograph of the Fire Station and Warehouse is provided on ***Figure 5-7***.

This area was transferred to Arkansas Army National Guard (ARARNG) with no restrictions imposed.5.1.7 Northeast Cantonment Area Fire Station (Building 1852)

The Northeast Cantonment Area Fire Station (Building 1852) is identified as an AOPI following records review due to possible nozzle testing and AFFF storage being conducted here. Located in Building 1852, it was constructed in 1942 and located in the Eastern Cantonment Area (***Figure 5-8***). It had capacity to house three fire-related vehicles. The building was destroyed in a 2008 fire. An aerial photograph of the Northeast Cantonment Area Fire Station is provided on ***Figure 5-8***.

This area was transferred to a private party with no restrictions imposed.

5.1.8 Hospital Area Fire Station (Building 3799)

The Hospital Area Fire Station (Building 3799) is identified as an AOPI following records research due to possible nozzle testing and AFFF storage being conducted here. Located in Building 3799, it was constructed in 1942 and located in the Hospital Area in the southern portion of the cantonment area (***Figure 5-9***). Little site history could be uncovered regarding this location and the Hospital Area Fire Station is no longer present on historical aerials between 2001 to 2002. An aerial photograph of the former Hospital Area Fire Station is provided on ***Figure 5-9***.

This area was transferred to Arkansas Army National Guard (ARARNG) with no restrictions imposed.

5.1.9 Oil/Water Separator Sludge Disposal Area (FTCH-033)

The Oil/Water Separator Sludge Disposal Area (FTCH-033) is identified as an AOPI following records review due to PFAS-containing sludge from AFFF-related activities being disposed of here. Used between 1975 and 1983, the site was used for oily debris which clogged up the wash racks. The material collected from the wash rack area was not from the oil/water separator as indicated in the name, but instead from the concrete wash basin itself. Material was spread on the ground surface. The disposal area was located northwest of the Sewage Treatment Lagoons (FTCH-011; ***Figure 5-10***). An aerial photograph of the Oil/Water Separator Sludge Disposal Area is also provided on ***Figure 5-10***.

This area was transferred to a private party with no restrictions imposed.

5.1.10 Sewage Treatment Lagoons (FTCH-011)

The Sewage Treatment Lagoons (FTCH-011) are identified as an AOPI following records review due to PFAS-containing materials from AFFF-related activities as well as other PFAS related activities such as film processing being disposed of here. Four sewage lagoons were installed in the northern portion of the installation, south of the Arkansas River between 1967 and 1995 (***Figure 5-10***). The lagoons processed sanitary sewer waste from across the installation and can be a concentration point for potential PFAS-impacted materials from various sources including x-ray and film processing facilities, wash racks, and oil/water separators. These lagoons discharge into the Arkansas River. All wash racks from the installation were routed here following oil/water separator processing. However, it is not confirmed whether wastewater from the New Fire Training Area oil/water separator was routed here, due to the recent nature of its development and a lack of engineering references. It is possible, albeit unlikely, that this separator discharge was routed elsewhere. An aerial photograph of the Sewage Treatment Lagoons is also provided on ***Figure 5-10***.

This area was transferred to City of Barling with no restrictions imposed.

5.1.11 East Land Application Site (FTCH-043)

The East Land Application Site (FTCH-043) is identified as an AOPI following records research due to potentially PFAS-containing soils from the Original Fire Training Area (FTCH-022) being disposed of here after they were excavated from the site. The site is located east of the cantonment area (***Figure 5-11***). It received soils excavated during the removal of petroleum-impacted soils from the Original Fire Training Area in 1990. Soil was treated biologically using a landfarming technique. An aerial photograph of the East Land Application Site is provided on ***Figure 5-11***.

This area was transferred to ARARNG with no restrictions imposed.

5.1.12 West Land Application Site (FTCH-044)

The West Land Application Site (FTCH-044) is identified as an AOPI following records review due to PFAS-containing soils disposed of here from the Original Fire Training Area (FTCH-022) after excavation. The site is located east of the western cantonment area and north of the Fort Chaffee Airfield (***Figure 5-12***). It received soils excavated during the removal of petroleum-impacted soils from the Original Fire Training Area in 1990. Soil was treated biologically using a landfarming technique.

An aerial photograph of the West Land Application Site is provided on ***Figure 5-12***. The West Land Application Site has been partly converted to open space and a supplies warehouse. The area is flat and includes a paved parking area and a grassy field. Stormwater drainage is located west along property and runs parallel to Chad Colley Boulevard. A pond is located east of the property.

This area was transferred to a private party with no restrictions imposed.

5.1.13 Arrowhead Landing Strip

The Arrowhead Landing Strip is identified as an AOPI following records research, personnel interviews, and site reconnaissance due to the possibility of nozzle testing or AFFF use in aircraft failure responses being made here. This landing strip is located on the south-central portion of the installation (***Figure 5-13***). It is 4,500 feet long and was used by C-130 aircraft. Training missions using the landing strip occurred here regularly throughout the JRTC mission. At the time of this PA, the FCJMTC Fire Department reports to this location on standby, along with firefighting assets from the Little Rock National Guard if fire response support is required. Fort Chaffee does not presently possess fire trucks with Class B foam support capability. Little Rock Air Force pumpers feature Class B foam (AFFF) capabilities; Fort Chaffee Fire Department fire trucks provide water capacity for additional assistance, if needed. According to interviews with FCJMTC Fire Department personnel, foam response has not occurred at this landing strip since the installation was transferred to the ARARNG. Foam response records during the time that JRTC was on-post and generally prior to BRAC remain a data gap, and if fire department procedures were similar historically (i.e., fire trucks with AFFF capabilities present during exercises), then it is possible that a foam response may have been necessary. Further, nozzle testing could possibly occur while Fort Chaffee Fire Department support awaited landings or takeoff to ensure effective foam response capabilities. Designated nozzle testing location(s) have not been established at the air strip and would likely have been at a convenient access point to the runway (e.g., west end, mid-point, or east end) based on training requirements and landing patterns for a particular day. An aerial photograph of the Arrowhead Landing Strip is provided on ***Figure 5-13***.

This area was transferred to ARARNG with no restrictions imposed.

5.1.14 Rattlesnake Landing Strip

The Rattlesnake Landing Strip is identified as an AOPI following records review and personnel interviews due to the possibility of nozzle testing or AFFF use in aircraft failure responses being made here. It was developed as an earthen landing strip for C-130 military aircraft and is located in the southeastern corner of the installation (***Figure 5-14***). The landing strip was in poor condition during the PA site visit; it was indicated that it was used less frequently than the Arrowhead Landing Strip. Foam response records during the time that JRTC was on-post and generally prior to BRAC remain a data gap, and if fire department procedures were similar historically (i.e., fire trucks with AFFF capabilities present during exercises), then it is possible that a foam response may have been necessary. Further, nozzle testing could possibly occur while Fort Chaffee Fire Department support awaited landings or takeoff to ensure effective foam response capabilities. Designated nozzle testing location(s) have not been established at the air strip and would likely have been at a convenient access point to the runway (e.g., west end, mid-

point, or east end) based on training requirements and landing patterns for a particular day. An aerial photograph of the Rattlesnake Landing Strip Station is provided on ***Figure 5-14***.

This area was transferred to ARARNG with no restrictions imposed.

5.1.15 Cantonment Area Heliports

The four Cantonment Area Heliports are identified as an AOPI following records review due to the possibility of AFFF being used in response to helicopter failures here. Four heliports are indicated to exist within the Cantonment Area (***Figures 5-15*** and ***5-16***). The area around the Fort Chaffee Airfield was also used as a drop zone for parachute JRTC training. They first appear in 1980 historical aerials. Two of these helicopter pads are located in close proximity to the Central Cantonment Area Fire Station and Primary Fire Station. An aerial photograph of the Cantonment Area Heliports is provided on ***Figures 5-15*** and ***5-16***.

This area was transferred to Ft. Chaffee Redevelopment Trust and Sebastian County with no restrictions imposed.

5.1.16 Fort Chaffee Airfield

The Fort Chaffee Airfield is identified as an AOPI following records review due to the possible use of AFFF in response to aircraft fires or nozzle testing here. It is located east of the western cantonment area and south of the West Land Application Site (***Figure 5-17***). The airfield was primarily used from 1953 and 1965, and then again from 1972 to sometime before 1991. It was used in JRTC training primarily as a helicopter drop zone. It began being redeveloped in 2001. It has been developed into other use buildings across the majority of the original airfield footprint. An aerial photograph of the Fort Chaffee Airfield is provided on ***Figure 5-17***.

This area was transferred to City of Ft. Smith with no restrictions imposed.

5.2 Areas Not Retained for Further Investigation

Through the evaluation of information obtained during records review, personnel interviews, and/or site reconnaissance, the areas described below were categorized as areas not retained for further investigation at this time (i.e., non-AOPIs). The locations of the non-AOPIs are shown on ***Figure 5-20***.

A brief site history and rationale for areas not retained for further investigation is presented in ***Table 5-1***, on the following page.

Table 5-1: Installation Areas Not Retained for Further Investigation

Area Description	Dates of Operation	Relevant Site History	Rationale	Land Ownership
FTCH-025 Troop Medical Clinic Silver Recovery Unit	1972 to 1991	Processed x-ray films from various buildings across the installation. The unit, which was small, recovered silver from a photochemical in x-rays. The photochemical solution discharged through a filter to the sanitary sewer which went to the sewage treatment lagoons that led to the Arkansas River. The unit was removed in 1990. After 1990, the processing of x-rays was completed in X-Ray Processing (Building 1340), where all developer was collected and picked up by Fort Chaffee Environmental Branch until BRAC 1995.	No spills of PFAS-containing materials indicated.	BRAC Surplus
X-Ray and Photograph Material Generators	Assumed 1985 to 1997	Included Former Dental Clinic (Building 1313), Current Troop Medical Clinic (Building 1339), Former Dental Clinic (Building 1393), Photo Lab (Building 2051), and Hospital Area (Building 3261). These areas all collected and developed either x-rays or film photographs. Waste was collected in jugs and then sent to FTCH-025 - Troop Medical Clinic Silver Recovery Unit to capture generated silver. No spills were reported. As activities were conducted inside buildings, any unreported spills would not be absorbed into media.	No spills of PFAS-containing materials indicated. Any spills would not be absorbed into media.	BRAC Surplus
Fire Station Storage	2014 to Present	Used as crash equipment storage area for the Primary Fire Station. Located in Building 2104.	Fire station storage building was installed following BRAC.	BRAC Surplus to ARARNG
FTCH-017 Vehicle Wash Rack Drainage Ditches	1942 to 1975	Natural and man-made drainage ditches for wash racks. In 1975, oil/water separators were installed at all of these drainage ditches and lines were routed to FTCH-011 Sewage Treatment Lagoons.	The beginning of relevant potential PFAS occurs after oil/water separators were installed throughout the installation.	BRAC Surplus to ARARNG Surplus
FTCH-031 Sewage Pumping Station	1942 to 1980	Wastewater was routed here before routing to the FTCH-011 Sewage Lagoons. Waste from FTCH-025 Troop Medical Clinic Recovery Unit and the wash racks would have been routed here prior to treatment in the lagoons. All wash racks from the installation were routed here following oil/water separator processing. Wastewater from the New Fire Training Area oil/water separator may have been routed here, although it is not confirmed whether these utilities were connected or if the discharge from the separator was routed elsewhere.	Material did not accumulate here but was rather conveyed to the Sewage Lagoons.	BRAC Surplus
FTCH-021 Used Oil Satellite Storage Containers	Unknown to 1997	Buildings were used to store used oil. The Fort Chaffee Fire Chief indicated in a 1995 interview that the Fort Chaffee Fire Department would occasionally respond to flammable material spills. The response actions were not specified, although AFFF has been used pre-emptively to prevent combustion during flammable material spills. If minor spills ignited, they could potentially have been responded to using AFFF as well. However, no records of Fire Department spill response procedures or records of where they may have responded to spills have been identified. The Environmental Baseline Survey Report indicates that minor petroleum-based spills (e.g., used oil, gasoline, jet fuel, diesel, hydraulic fluid) occurred at all oil houses, fueling stations, used oil storage facilities, gasoline storage buildings, and the Building 470 Motor Pool.	No confirmed spill response locations by the Fort Chaffee Fire Department.	BRAC Surplus to ARARNG
FTCH-009 Former Dichlorodiphenyl trichloroethane	Before 1966 to 1979	FTCH-009, the surrounding lot, and the rear-area drainage ditch made up the DDT storage area. Building 314 was a structure of 25 open-front sheds or bays with unbermed earthen floors. Excess DDT was stored in 55-gallon drums stacked on	Pesticides did not contain PFAS.	BRAC Surplus to Chaffee Commercial

Area Description	Dates of Operation	Relevant Site History	Rationale	Land Ownership
(DDT) storage area		wooden pallets in Bay 11 of Building 314. A review of historical documents indicates that Fort Chaffee did not store, use, or dispose of PFAS-containing pesticides.		Properties, LLC
Historic Pesticide Storage and Mixing Building	Unknown to late 1970s	Building utilized to store and mix various pesticides. Located at Building 477. Served by a septic tank and leach field which remain in place. A review of historical documents indicates that Fort Chaffee did not store, use, or dispose of PFAS-containing pesticides.	Pesticides did not contain PFAS.	BRAC Surplus to Chaffee Commercial Properties, LLC
FTCH-042A Pesticide Handling Area	Operated since late 1970s to an Unknown	Site no longer in use. Located at Building 540. Drums were stored in a secondary containment area and mixing activities took place on concrete mixing pads adjacent to the building. No pesticides were disposed through the building drainage system. Floor drains in the building are sealed and the drain discharge holding tank is gone. A review of historical documents indicates that Chaffee did not store, use, or dispose of PFAS-containing pesticides.	Pesticides did not contain PFAS.	BRAC Surplus
Storage of Petroleum, Oil, and Lubricant (POL), paint and former pesticide	Unknown to 1997	Located at Building 3911. A review of historical documents indicates that Fort Chaffee did not store, use, or dispose of PFAS-containing pesticides. The Fort Chaffee Fire Chief indicated in a 1995 interview that the Fort Chaffee Fire Department would occasionally respond to flammable material spills. The response actions were not specified, although AFFF has been used pre-emptively to prevent combustion during flammable material spills. If minor spills ignited, they could potentially have been responded to using AFFF as well. However, no records of Fort Chaffee Fire Department spill response procedures or records of where they may have responded to spills have been identified. The Environmental Baseline Survey Report indicates that minor petroleum-based spills (e.g., used oil, gasoline, jet fuel, diesel, hydraulic fluid) occurred at all oil houses, fueling stations, used oil storage facilities, gasoline storage buildings, and the Building 470 Motor Pool.	No documentation of Fire Department response to spill; pesticides did not contain PFAS.	BRAC Surplus
Oil Water Separators and Attached Systems (FTCH-034)	1975 to Approximately 1988	Twenty-two oil/water separators were installed across the main cantonment areas of Fort Chaffee. Potential PFAS impacted water and soil could enter the systems during the washing of fire department vehicles that carried AFFF. Potential PFAS impacts could be present at the oil/water separators and have been passed along to the sludge disposal area (FTCH-033) and/or sewage treatment lagoons.	Sampling at the water and waste collection areas (FTCH-011 and FTCH-033) is recommended to be completed first.	BRAC Surplus to ARARNG
Open burn/open detonation (OB/OD) Area (FTCH-020)	1987 to 1994	The OB/OD Area was a Resource Conservation and Recovery Act interim status unit for open burning of excess powder increments and OD of unexploded ordnance. The site began operation in 1987 and consisted of three clay-lined trenches (150 feet long by 10 feet wide by six inches deep) for OB and two craters for OD. The area was inspected in 1992 by the Arkansas Department of Pollution Control and Ecology, which issued a violation for destroying waste materials not included in the RCRA air permit, but records do not indicate what unpermitted materials were destroyed. Explosive demolition was conducted on trinitrotoluene, Fougasse, and C4. A list munitions specifically destroyed at the OB/OD Area is unavailable. However, munitions items including practice hand grenades, practice landmines, ground rockets, medium caliber munitions (20mm, 25mm, and 30mm), various exploding munitions, 2.75-inch rockets, MK-106, BDU33, claymore mine devices, smoke grenades, practice rifle grenades, 40mm	Interviews and physical records available for review did not identify PFAS-containing materials as having been disposed of here.	BRAC Surplus to ARARNG

Area Description	Dates of Operation	Relevant Site History	Rationale	Land Ownership
Open burn/open detonation (OB/OD) Area (FTCH-020)	1987 to 1994	grenades, M23 illumination signals, and slap flares are all described as having been used at the installation and could potentially have been destroyed at the OB/OD Area (2003 URS Group Inc.). Munitions may have contained fluoropolymers. In 1993, metal burn pads were added. OB/OD operations ceased in 1994.		BRAC Surplus to ARARNG
Former ANG Burn Pit (FTCH-004)	1973 to 1988	Originally constructed in 1973, the pit was used by the ANG to burn waste materials, including munitions items which may have contained fluoropolymers. At one point, the pit was 100 feet long, by 12 feet wide, by 5 feet deep. Fuel oil covered packing material was used to start a fire to destroy residual compounds. The pit included dummy munitions, residual pyrotechnics, ammunition casings, and metal fragments.	Interviews and physical records available for review did not identify PFAS-containing materials as having been disposed of here.	BRAC Surplus to ARARNG

Note: BRAC Surplus indicates the property is not under DoD, Active Army, or FCJMTC control.

Figure 5-2: AOPI Locations

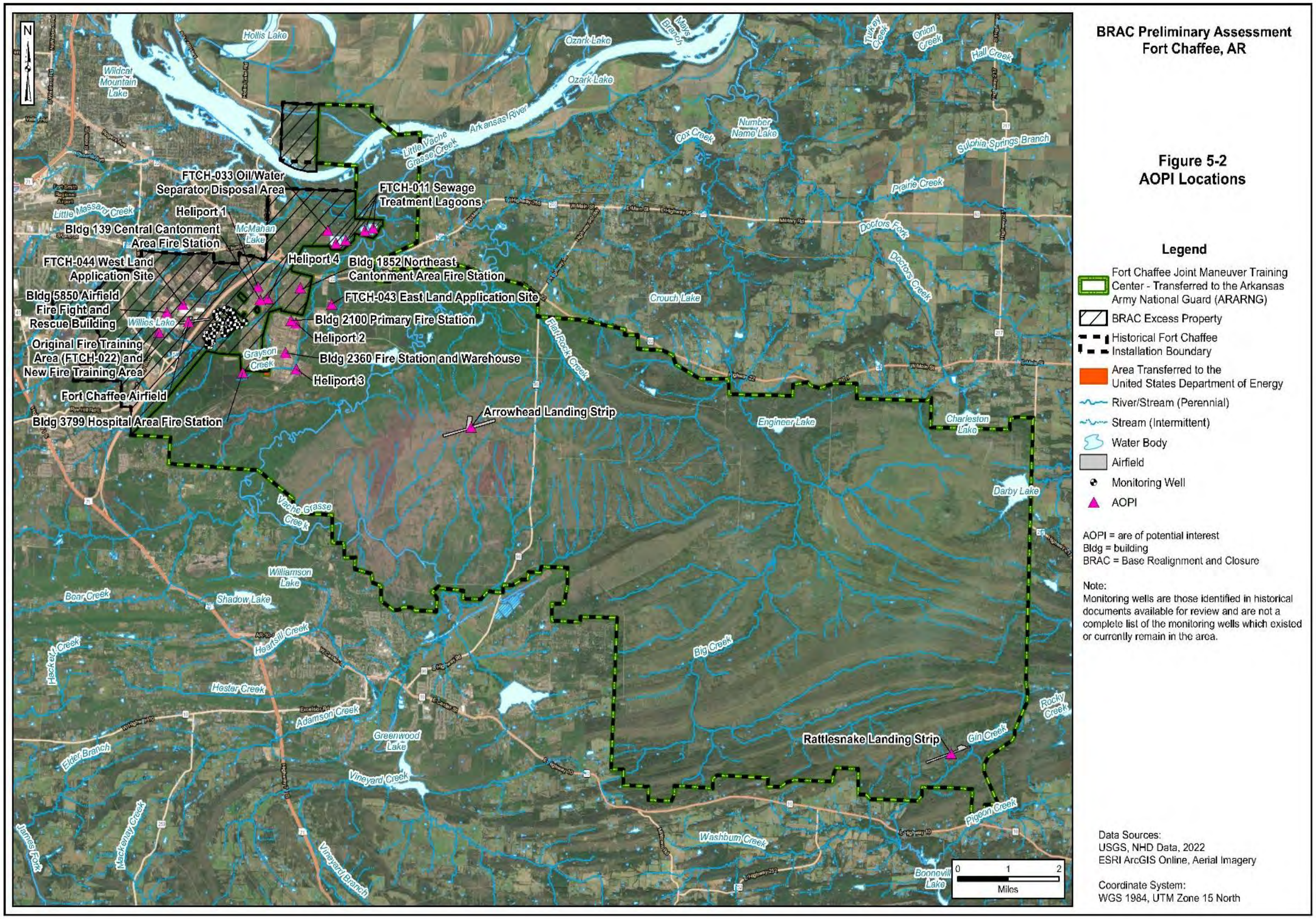

BRAC Preliminary Assessment
Fort Chaffee, AR
Figure 5-2
AOPI Locations
Legend
Fort Chaffee Joint Maneuver Training Center - Transferred to the Arkansas Army National Guard (ARARNG)
BRAC Excess Property
Historical Fort Chaffee Installation Boundary
Area Transferred to the United States Department of Energy
River/Stream (Perennial)
Stream (Intermittent)
Water Body
Airfield
Monitoring Well
AOPI
AOPI = are of potential interest
Bldg = building
BRAC = Base Realignment and Closure
Note:
Monitoring wells are those identified in historical documents available for review and are not a complete list of the monitoring wells which existed or currently remain in the area.
Data Sources:
USGS, NHD Data, 2022
ESRI ArcGIS Online, Aerial Imagery
Coordinate System:
WGS 1984, UTM Zone 15 North
FTCH-033 Oil/Water Separator Disposal Area
Heliport 1
Bldg 139 Central Cantonment Area Fire Station
FTCH-044 West Land Application Site
Bldg 5850 Airfield Fire Fight and Rescue Building
Original Fire Training Area (FTCH-022) and New Fire Training Area
Fort Chaffee Airfield
Bldg 3799 Hospital Area Fire Station
FTCH-011 Sewage Treatment Lagoons
Heliport 4
Bldg 1852 Northeast Cantonment Area Fire Station
FTCH-043 East Land Application Site
Bldg 2100 Primary Fire Station
Heliport 2
Bldg 2360 Fire Station and Warehouse
Heliport 3
Arrowhead Landing Strip
Rattlesnake Landing Strip
Arkansas River
0 1 2
Miles

Figure 5-3: Aerial Photo of Original Fire Training Area (FTCH-022) & New Fire Training Area AOPIs


N
Wilds Lake Rd
9100
Custer Blvd
Veterans Ave
Former Fuel Storage AST
New Fire Training Pit
New Fire Training Area
Oil/Water Separator
Former Fuel Storage Bin
Overflow Weir
Old Fire Training Pits
Former Fuel Storage AST
Original Fire Training Area (FTCH-022)
0 50 100
Feet
BRAC Preliminary Assessment
Fort Chaffee, AR
Figure 5-3
Aerial Photo of
Original Fire Training Area
(FTCH-022) and
New Fire Training Area
AOPIs
Legend
Fort Chaffee Joint Maneuver Training Center - Transferred to the Arkansas Army National Guard (ARARNG)
BRAC Excess Property
River/Stream (Perennial)
Water Body
AOPI
Site Feature
AOPI = area of potential interest
AST = above ground storage tank
BRAC = Base Realignment and Closure
Data Sources:
USGS, NHD Data, 2022
ESRI ArcGIS Online, Aerial Imagery
Coordinate System:
WGS 1984, UTM Zone 15 North

Figure 5-4: Aerial Photo of Bldg. 5850 Airfield Fire Fighter & Rescue Fire Station AOPI


N
Bldg 5850 Airfield Fire Fight and Rescue Building
Wash Rack
Veterans Ave
0 50 100
Feet
BRAC Preliminary Assessment
Fort Chaffee, AR
Figure 5-4
Aerial Photo of
Building 5850 Airfield Fire Fight and Rescue Fire Station AOPI
Legend
Fort Chaffee Joint Maneuver Training Center - Transferred to the Arkansas Army National Guard (ARARNG)
BRAC Excess Property
AOPI
AOPI = area of potential interest
Bldg = building
BRAC = Base Realignment and Closure
Data Sources:
USGS, NHD Data, 2022
ESRI ArcGIS Online, Aerial Imagery
Coordinate System:
WGS 1984, UTM Zone 15 North

Figure 5-5: Aerial Photo of Bldg. 2100 Primary Fire Station AOPI

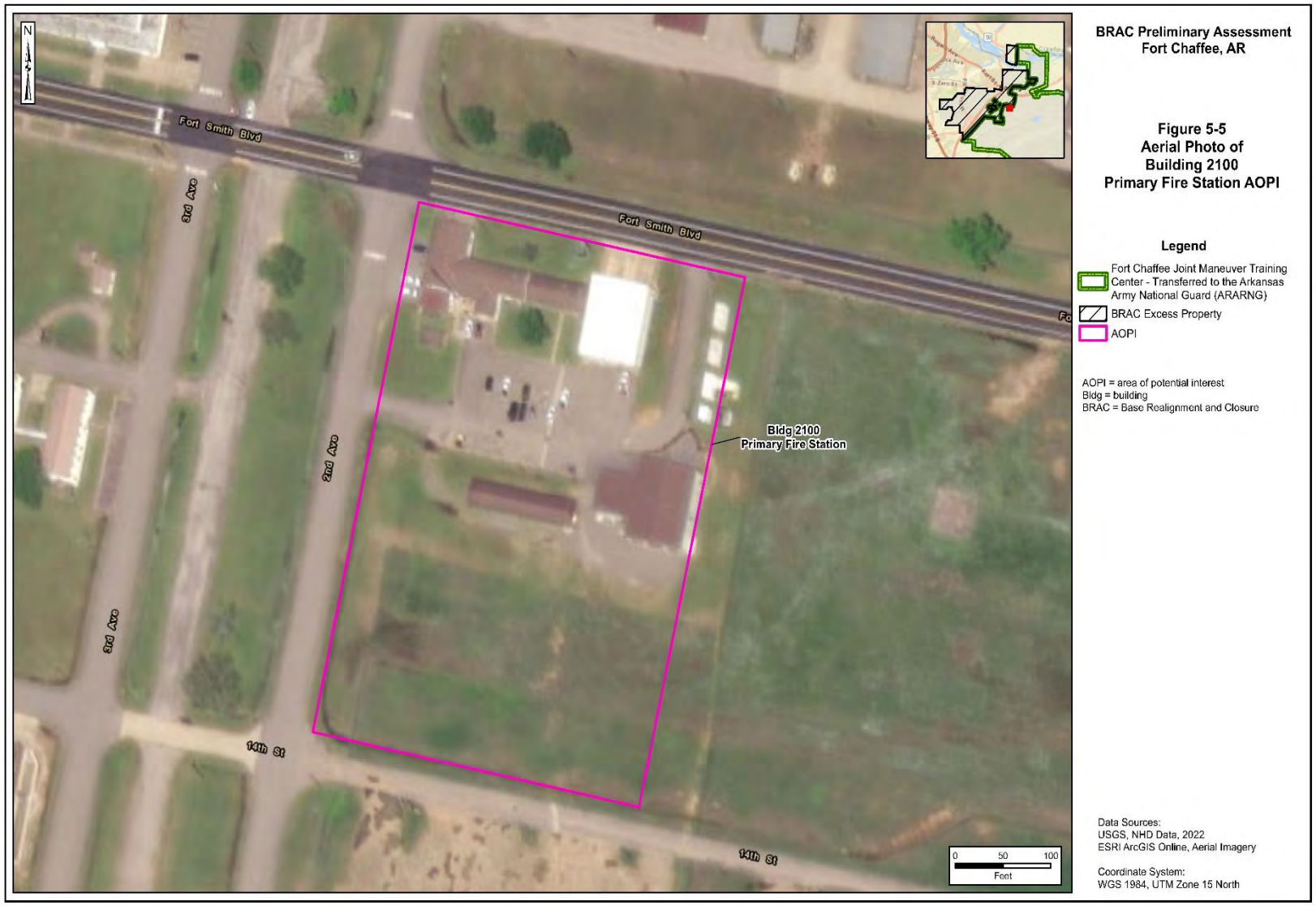

N
Fort Smith Blvd
Fort Smith Blvd
3rd Ave
2nd Ave
3rd Ave
14th St
14th St
Bldg 2100
Primary Fire Station
0 50 100
Feet
BRAC Preliminary Assessment
Fort Chaffee, AR
Figure 5-5
Aerial Photo of
Building 2100
Primary Fire Station AOPI
Legend
Fort Chaffee Joint Maneuver Training Center - Transferred to the Arkansas Army National Guard (ARARNG)
BRAC Excess Property
AOPI
AOPI = area of potential interest
Bldg = building
BRAC = Base Realignment and Closure
Data Sources:
USGS, NHD Data, 2022
ESRI ArcGIS Online, Aerial Imagery
Coordinate System:
WGS 1984, UTM Zone 15 North

Figure 5-6: Aerial Photo of Bldg. 139 Central Cantonment Area Fire Station AOPI

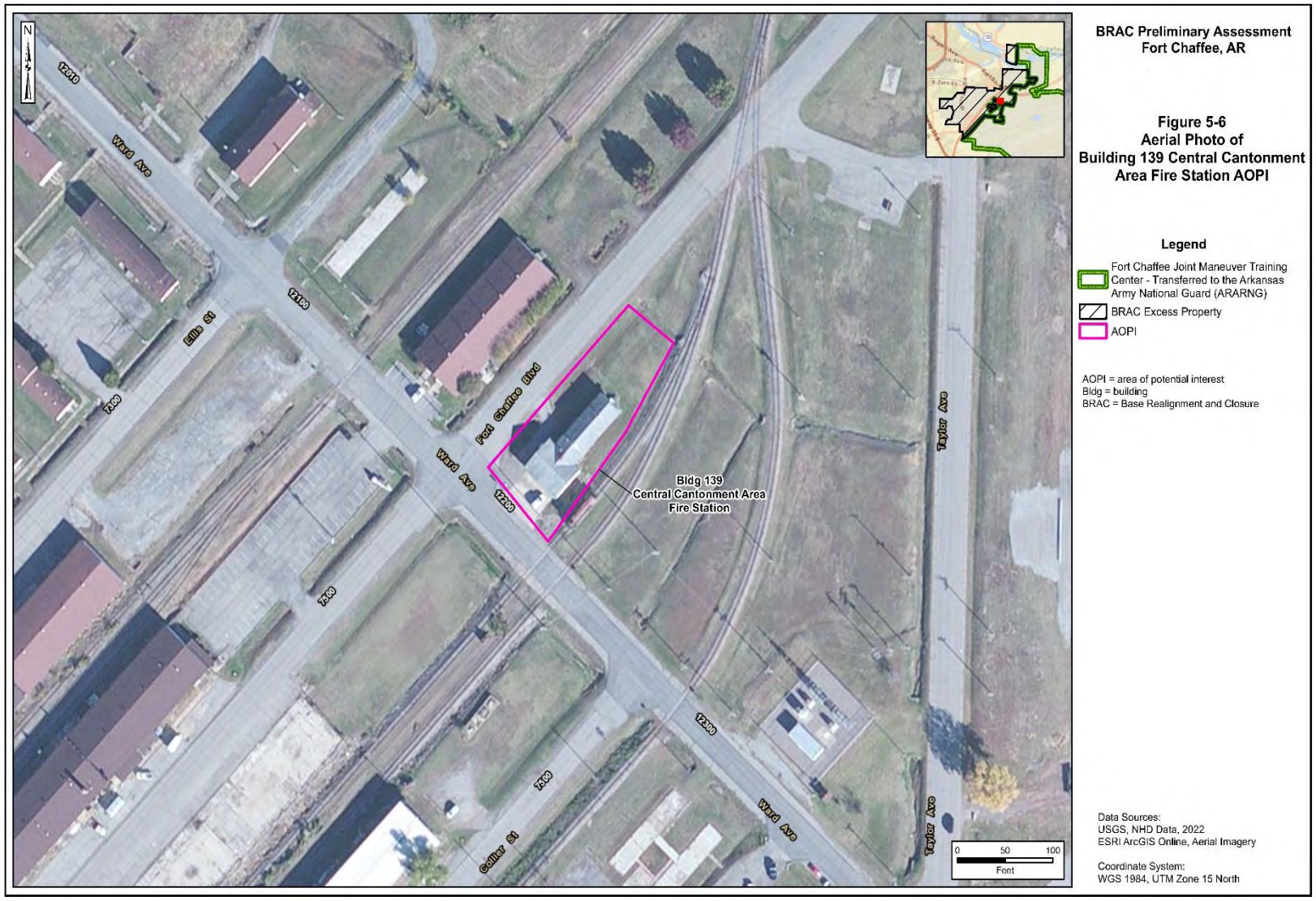

N
Ward Ave
Ellis St
Fort Chaffee Blvd
Taylor Ave
Bldg 139
Central Cantonment Area
Fire Station
Geiger St
0
50
100
Feet
BRAC Preliminary Assessment
Fort Chaffee, AR
Figure 5-6
Aerial Photo of
Building 139 Central Cantonment
Area Fire Station AOPI
Legend
Fort Chaffee Joint Maneuver Training Center - Transferred to the Arkansas Army National Guard (ARARNG)
BRAC Excess Property
AOPI
AOPI = area of potential interest
Bldg = building
BRAC = Base Realignment and Closure
Data Sources:
USGS, NHD Data, 2022
ESRI ArcGIS Online, Aerial Imagery
Coordinate System:
WGS 1984, UTM Zone 15 North

Figure 5-7: Aerial Photo of Bldg. 2360 Fire Station & Warehouse AOPI


N
22nd St
2nd Ave
3rd Ave
Former Building Footprint
Bldg 2360 Fire Station and Warehouse
23rd St
24th St
0 50 100
Feet
BRAC Preliminary Assessment
Fort Chaffee, AR
Figure 5-7
Aerial Photo of
Building 2360 Fire Station
and Warehouse AOPI
Legend
Fort Chaffee Joint Maneuver Training Center - Transferred to the Arkansas Army National Guard (ARARNG)
BRAC Excess Property
AOPI
Former Building Footprint
AOPI = area of potential interest
Bldg = building
BRAC = Base Realignment and Closure
Data Sources:
USGS, NHD Data, 2022
ESRI ArcGIS Online, Aerial Imagery
Coordinate System:
WGS 1984, UTM Zone 15 North

Figure 5-8: Aerial Photo of Bldg. 1852 Northeast Cantonment Area Fire Station AOPI

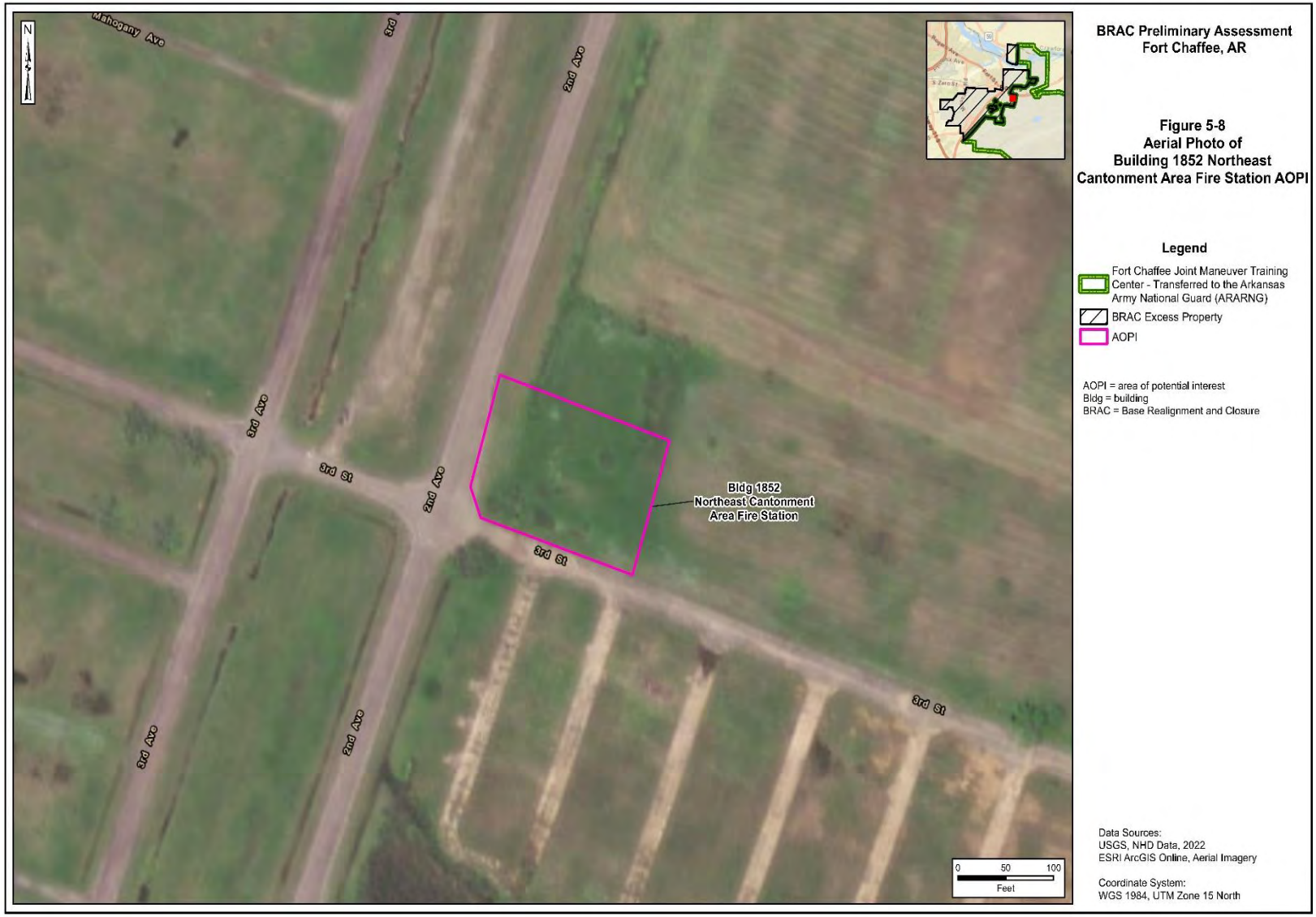

N
Mahogany Ave
3rd Ave
2nd Ave
3rd St
Bldg 1852
Northeast Cantonment
Area Fire Station
0
50
100
Feet
BRAC Preliminary Assessment
Fort Chaffee, AR
Figure 5-8
Aerial Photo of
Building 1852 Northeast
Cantonment Area Fire Station AOPI
Legend
Fort Chaffee Joint Maneuver Training Center - Transferred to the Arkansas Army National Guard (ARARNG)
BRAC Excess Property
AOPI
AOPI = area of potential interest
Bldg = building
BRAC = Base Realignment and Closure
Data Sources:
USGS, NHD Data, 2022
ESRI ArcGIS Online, Aerial Imagery
Coordinate System:
WGS 1984, UTM Zone 15 North

Figure 5-9: Aerial Photo of Bldg. 3799 Hospital Area Fire Station AOPI

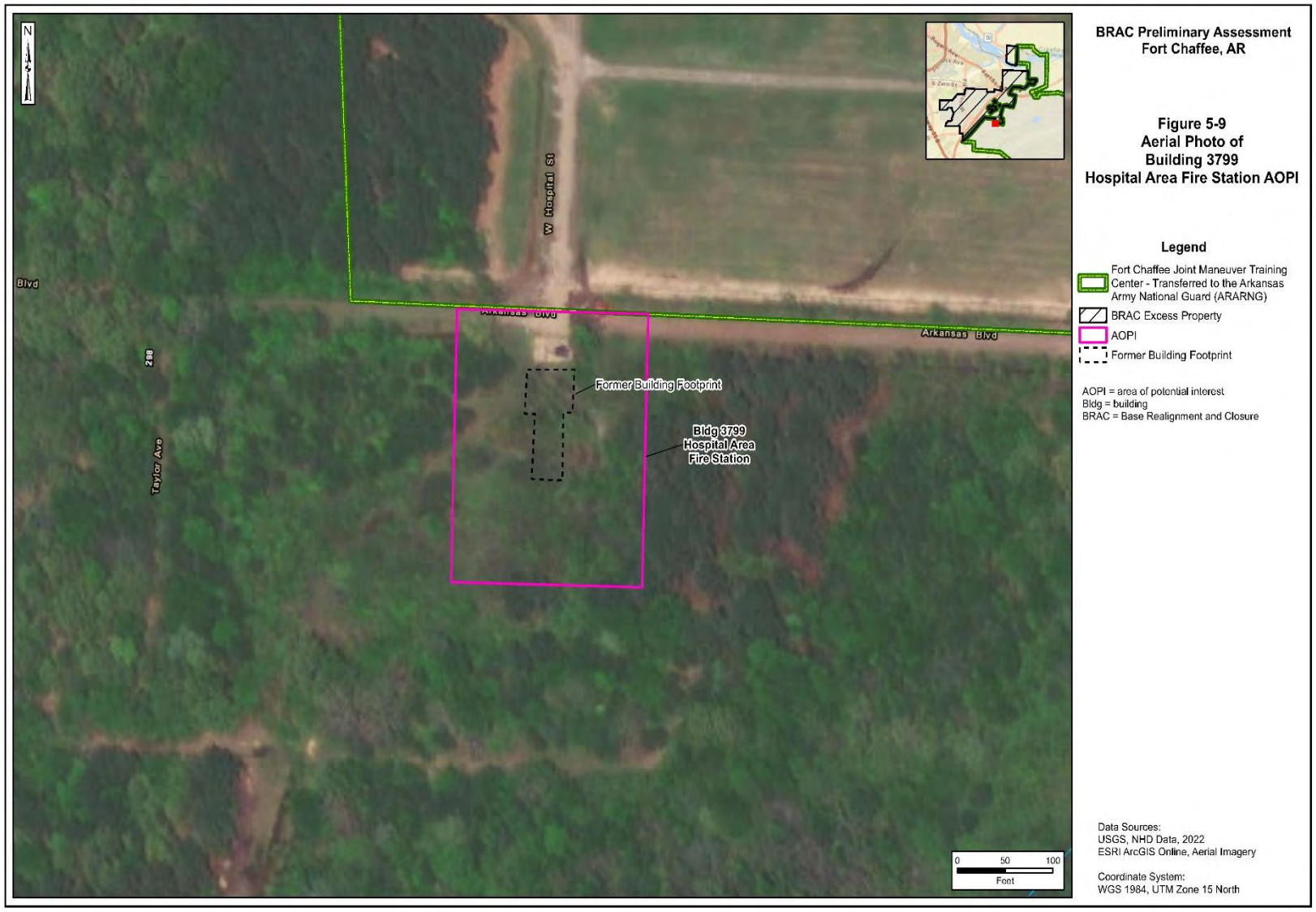

N
W Hospital St
Blvd
Arkansas Blvd
Arkansas Blvd
298
Taylor Ave
Former Building Footprint
Bldg 3799
Hospital Area
Fire Station
0 50 100
Feet
BRAC Preliminary Assessment
Fort Chaffee, AR
Figure 5-9
Aerial Photo of
Building 3799
Hospital Area Fire Station AOPI
Legend
Fort Chaffee Joint Maneuver Training Center - Transferred to the Arkansas Army National Guard (ARARNG)
BRAC Excess Property
AOPI
Former Building Footprint
AOPI = area of potential interest
Bldg = building
BRAC = Base Realignment and Closure
Data Sources:
USGS, NHD Data, 2022
ESRI ArcGIS Online, Aerial Imagery
Coordinate System:
WGS 1984, UTM Zone 15 North

Figure 5-10: Aerial Photo of FTCH-011 Sewage Lagoons & FTCH-033 Oil/Water Separator Disposal Area AOPIs

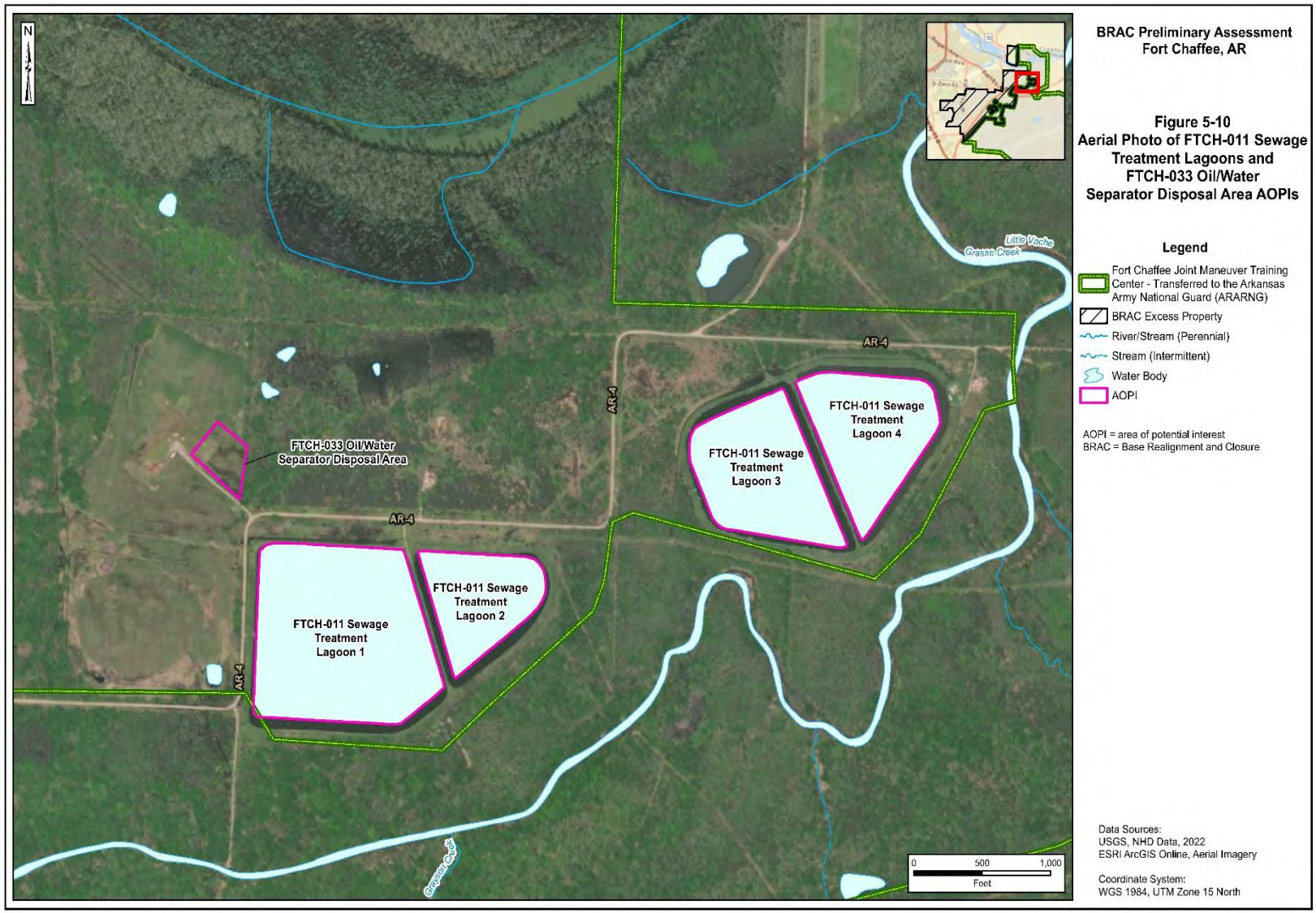

N
FTCH-033 Oil/Water Separator Disposal Area
FTCH-011 Sewage Treatment Lagoon 1
FTCH-011 Sewage Treatment Lagoon 2
FTCH-011 Sewage Treatment Lagoon 3
FTCH-011 Sewage Treatment Lagoon 4
AR-4
AR-4
AR-4
Little Vache Grasse Creek
Grayson Creek
0
500
1,000
Feet
BRAC Preliminary Assessment
Fort Chaffee, AR
Figure 5-10
Aerial Photo of FTCH-011 Sewage Treatment Lagoons and FTCH-033 Oil/Water Separator Disposal Area AOPIs
Legend
Fort Chaffee Joint Maneuver Training Center - Transferred to the Arkansas Army National Guard (ARARNG)
BRAC Excess Property
River/Stream (Perennial)
Stream (Intermittent)
Water Body
AOPI
AOPI = area of potential interest
BRAC = Base Realignment and Closure
Data Sources:
USGS, NHD Data, 2022
ESRI ArcGIS Online, Aerial Imagery
Coordinate System:
WGS 1984, UTM Zone 15 North

Figure 5-11: Aerial Photo of FTCH-043 East Land Application Site AOPI

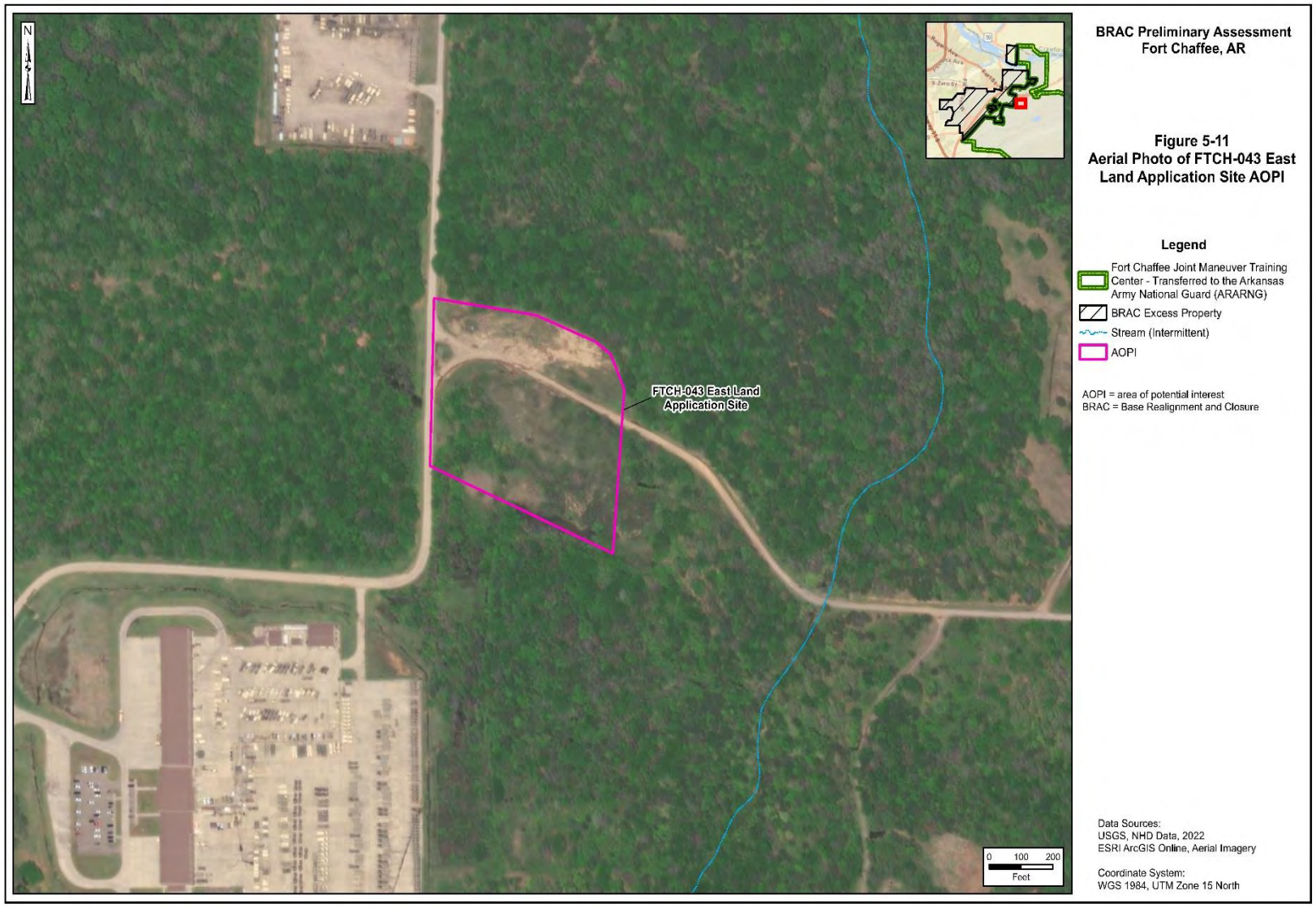

N
FTCH-043 East Land Application Site
0 100 200
Feet
BRAC Preliminary Assessment
Fort Chaffee, AR
Figure 5-11
Aerial Photo of FTCH-043 East Land Application Site AOPI
Legend
Fort Chaffee Joint Maneuver Training Center - Transferred to the Arkansas Army National Guard (ARARNG)
BRAC Excess Property
Stream (Intermittent)
AOPI
AOPI = area of potential interest
BRAC = Base Realignment and Closure
Data Sources:
USGS, NHD Data, 2022
ESRI ArcGIS Online, Aerial Imagery
Coordinate System:
WGS 1984, UTM Zone 15 North

Figure 5-12: Aerial Photo of FTCH-044 West Land Application Site AOPI


BRAC Preliminary Assessment
Fort Chaffee, AR
Figure 5-12
Aerial Photo of FTCH-044 West Land Application Site AOPI
Legend
Fort Chaffee Joint Maneuver Training Center - Transferred to the Arkansas Army National Guard (ARARNG)
BRAC Excess Property
Stream (Intermittent)
AOPI
AOPI = area of potential interest
BRAC = Base Realignment and Closure
FTCH-044 West Land Application Site
Roberts Blvd
Chad Colley Blvd
Flagstone Rd
Black Bear Trl
Veterans Ave
Free Blvd
0 100 200
Feet
Data Sources:
USGS, NHD Data, 2022
ESRI ArcGIS Online, Aerial Imagery
Coordinate System:
WGS 1984, UTM Zone 15 North

Figure 5-13: Aerial Photo of Arrowhead Landing Strip AOPI

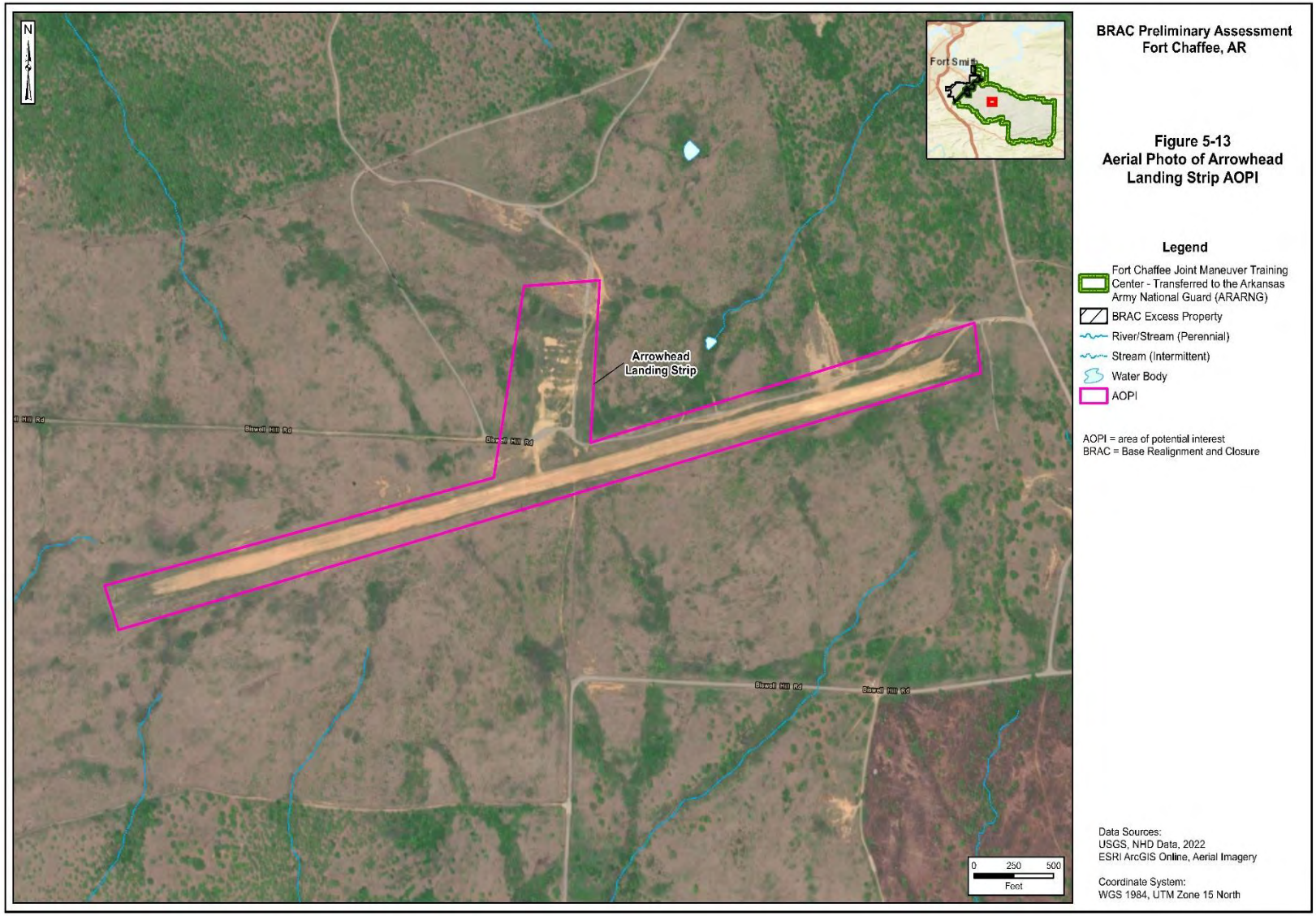

N
Fort Smith
Arrowhead Landing Strip
Biswell Hill Rd
Biswell Hill Rd
Biswell Hill Rd
Biswell Hill Rd
0 250 500
Feet
BRAC Preliminary Assessment
Fort Chaffee, AR
Figure 5-13
Aerial Photo of Arrowhead Landing Strip AOPI
Legend
Fort Chaffee Joint Maneuver Training Center - Transferred to the Arkansas Army National Guard (ARARNG)
BRAC Excess Property
River/Stream (Perennial)
Stream (Intermittent)
Water Body
AOPI
AOPI = area of potential interest
BRAC = Base Realignment and Closure
Data Sources:
USGS, NHD Data, 2022
ESRI ArcGIS Online, Aerial Imagery
Coordinate System:
WGS 1984, UTM Zone 15 North

Figure 5-14: Aerial Photo of Rattlesnake Landing Strip AOPI

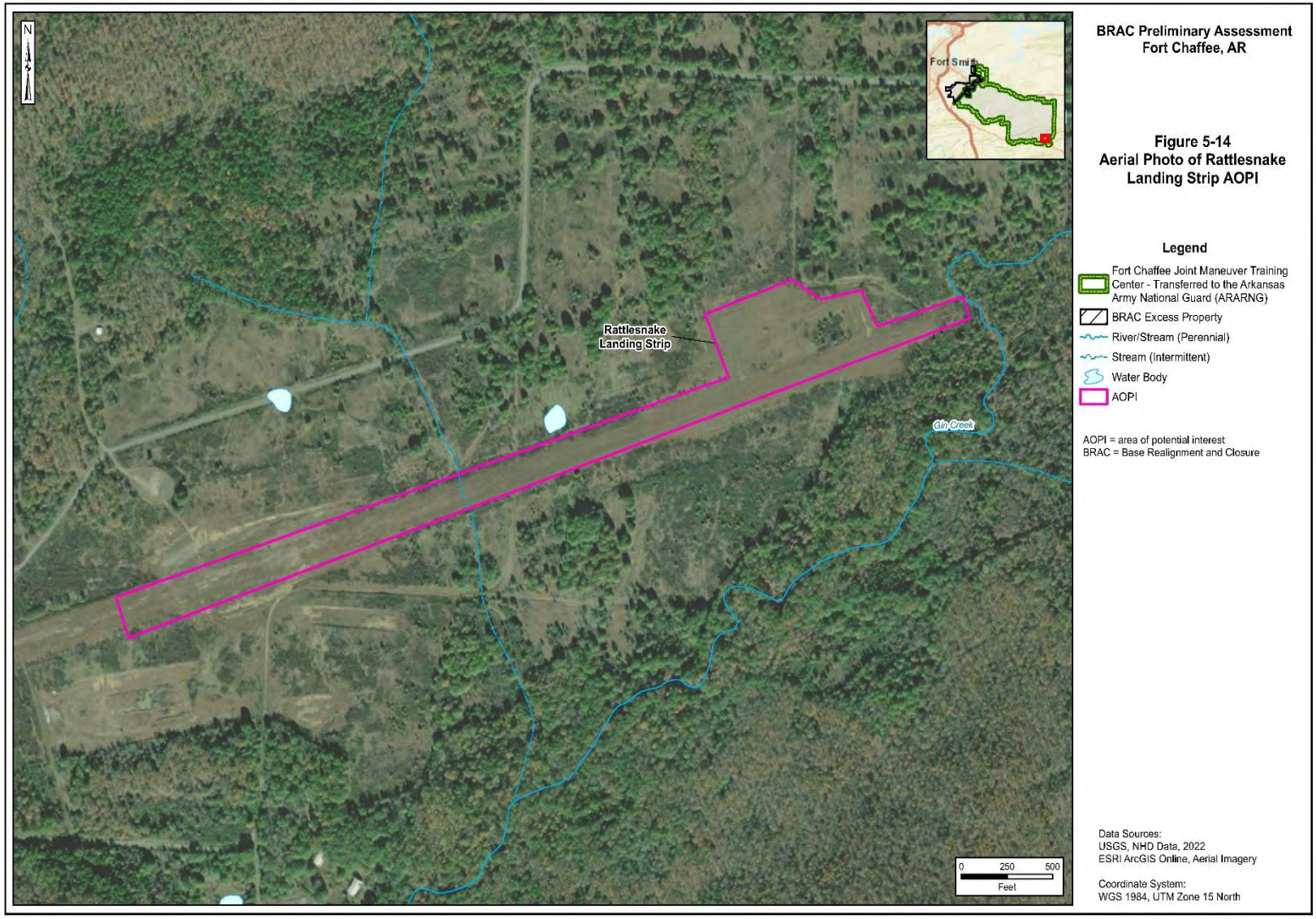

N
Fort Smith
Rattlesnake
Landing Strip
Gin Creek
0 250 500
Feet
BRAC Preliminary Assessment
Fort Chaffee, AR
Figure 5-14
Aerial Photo of Rattlesnake
Landing Strip AOPI
Legend
Fort Chaffee Joint Maneuver Training Center - Transferred to the Arkansas Army National Guard (ARARNG)
BRAC Excess Property
River/Stream (Perennial)
Stream (Intermittent)
Water Body
AOPI
AOPI = area of potential interest
BRAC = Base Realignment and Closure
Data Sources:
USGS, NHD Data, 2022
ESRI ArcGIS Online, Aerial Imagery
Coordinate System:
WGS 1984, UTM Zone 15 North

Figure 5-15: Aerial Photo of Heliport 1 & Heliport 4 AOPIs


N
Heliport 1
Heliport 4
7000
Taylor Ave
7100
Terry St
7200
12100
12000
Redwood Dr
Wood Ave
12200
7300
Buckhorn St
0
100
200
Feet
BRAC Preliminary Assessment
Fort Chaffee, AR
Figure 5-15
Aerial Photo of Heliport 1 and Heliport 4 AOPIs
Legend
Fort Chaffee Joint Maneuver Training Center - Transferred to the Arkansas Army National Guard (ARARNG)
BRAC Excess Property
Stream (Intermittent)
AOPI
AOPI = area of potential interest
BRAC = Base Realignment and Closure
Data Sources:
USGS, NHD Data, 2022
ESRI ArcGIS Online, Aerial Imagery
Coordinate System:
WGS 1984, UTM Zone 15 North

Figure 5-16: Aerial Photo of Heliport 2 & Heliport 3 AOPIs

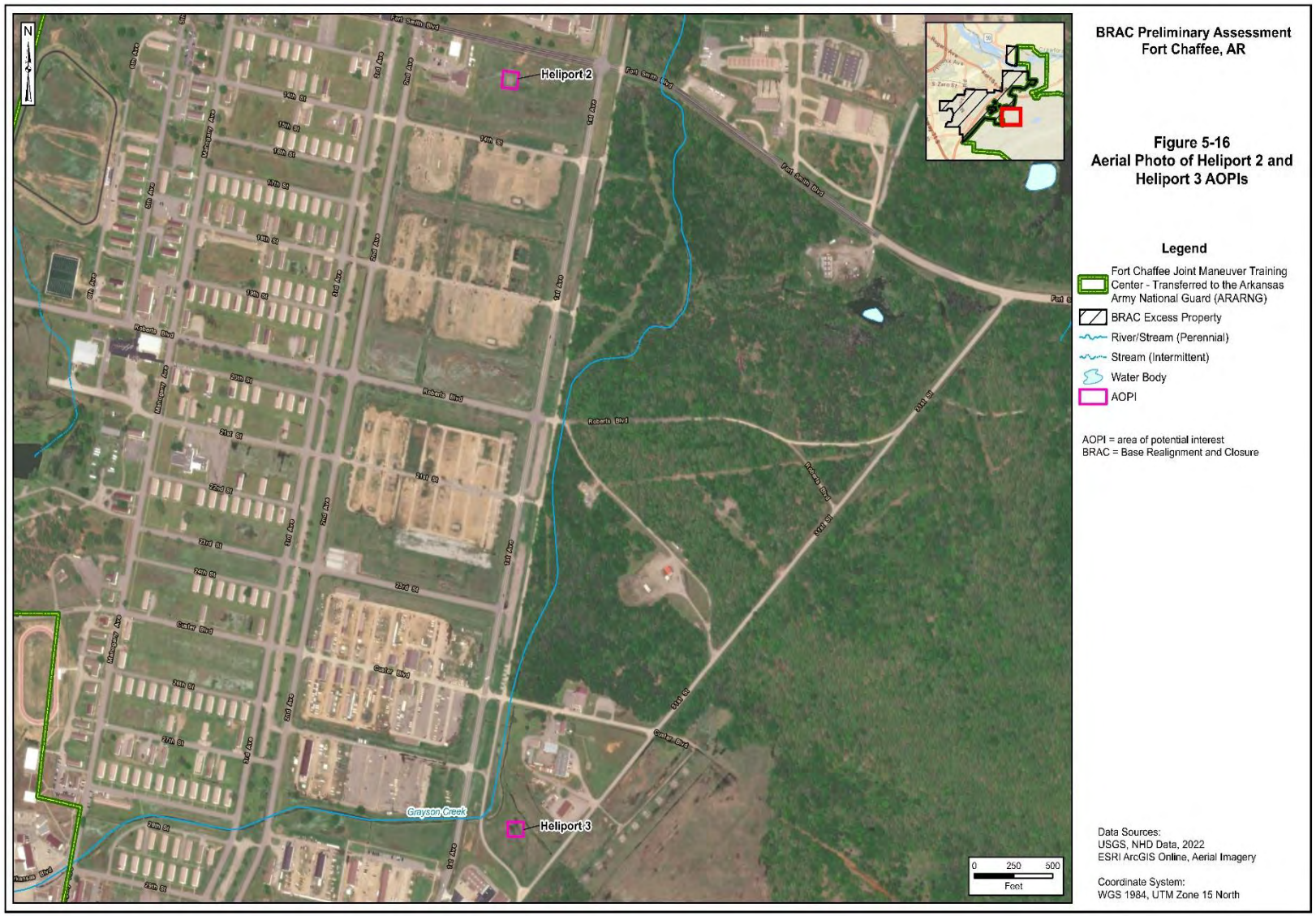

BRAC Preliminary Assessment
Fort Chaffee, AR
Figure 5-16
Aerial Photo of Heliport 2 and Heliport 3 AOPIs
Legend
Fort Chaffee Joint Maneuver Training Center - Transferred to the Arkansas Army National Guard (ARARNG)
BRAC Excess Property
River/Stream (Perennial)
Stream (Intermittent)
Water Body
AOPI
AOPI = area of potential interest
BRAC = Base Realignment and Closure
Heliport 2
Heliport 3
Grayson Creek
Roberts Blvd
Fort Smith Blvd
Custer Blvd
0 250 500
Feet
Data Sources:
USGS, NHD Data, 2022
ESRI ArcGIS Online, Aerial Imagery
Coordinate System:
WGS 1984, UTM Zone 15 North

Figure 5-17: Aerial Photo of Fort Chaffee Airfield AOPI

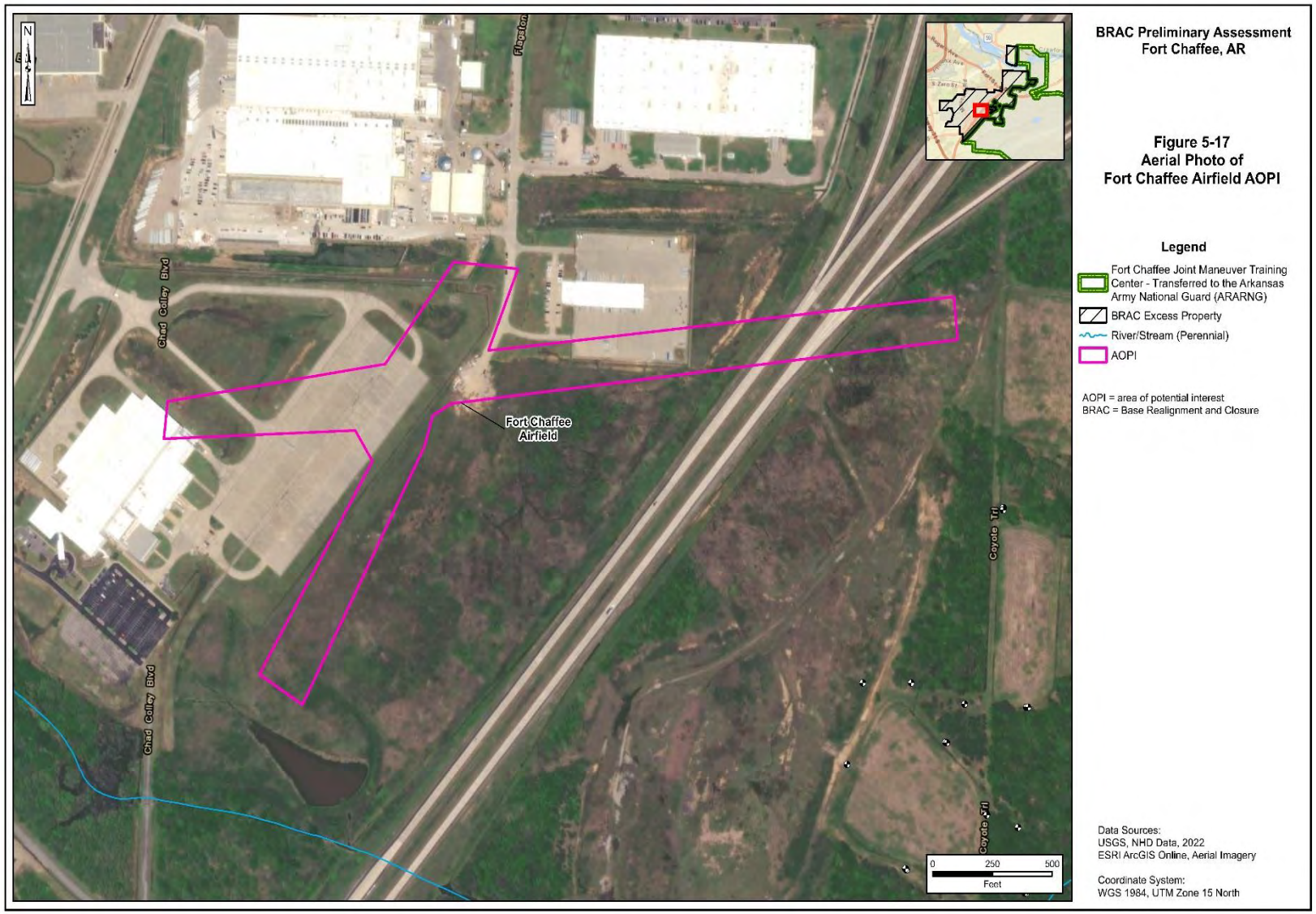
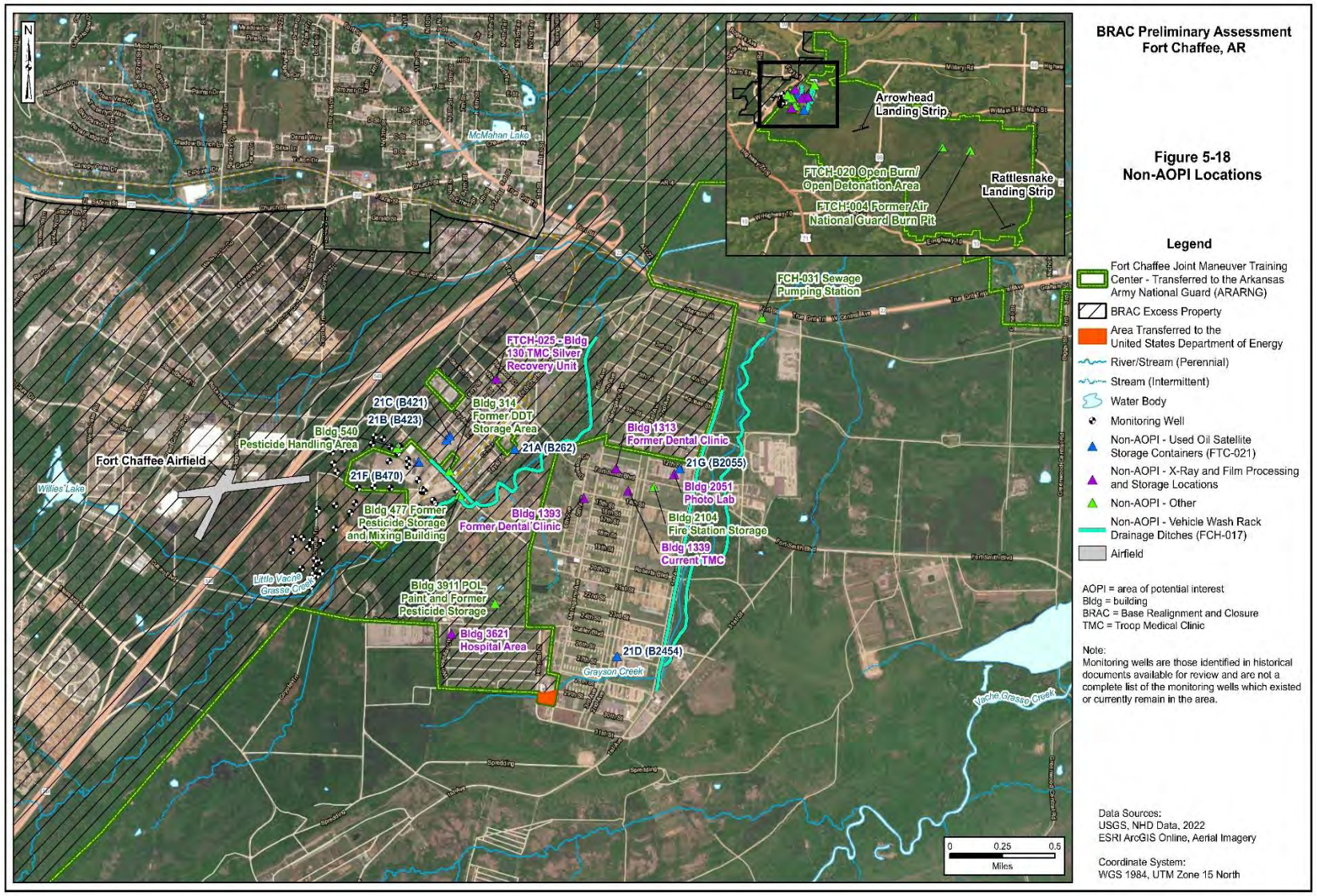

N
Flightline
Chad Colley Blvd
Chad Colley Blvd
Fort Chaffee Airfield
Coyote Trl
Coyote Trl
0
250
500
Feet
BRAC Preliminary Assessment
Fort Chaffee, AR
Figure 5-17
Aerial Photo of
Fort Chaffee Airfield AOPI
Legend
Fort Chaffee Joint Maneuver Training Center - Transferred to the Arkansas Army National Guard (ARARNG)
BRAC Excess Property
River/Stream (Perennial)
AOPI
AOPI = area of potential interest
BRAC = Base Realignment and Closure
Data Sources:
USGS, NHD Data, 2022
ESRI ArcGIS Online, Aerial Imagery
Coordinate System:
WGS 1984, UTM Zone 15 North

Figure 5-18: Non-AOPI Locations


BRAC Preliminary Assessment
Fort Chaffee, AR
Figure 5-18
Non-AOPI Locations
Legend
Fort Chaffee Joint Maneuver Training Center - Transferred to the Arkansas Army National Guard (ARARNG)
BRAC Excess Property
Area Transferred to the United States Department of Energy
River/Stream (Perennial)
Stream (Intermittent)
Water Body
Monitoring Well
Non-AOPI - Used Oil Satellite Storage Containers (FTC-021)
Non-AOPI - X-Ray and Film Processing and Storage Locations
Non-AOPI - Other
Non-AOPI - Vehicle Wash Rack Drainage Ditches (FCH-017)
Airfield
AOPI = area of potential interest
Bldg = building
BRAC = Base Realignment and Closure
TMC = Troop Medical Clinic
Note:
Monitoring wells are those identified in historical documents available for review and are not a complete list of the monitoring wells which existed or currently remain in the area.
Data Sources:
USGS, NHD Data, 2022
ESRI ArcGIS Online, Aerial Imagery
Coordinate System:
WGS 1984, UTM Zone 15 North
0 0.25 0.5
Miles
N
Arrowhead Landing Strip
Rattlesnake Landing Strip
FTCH-020 Open Burn/ Open Detonation Area
FTCH-004 Former Air National Guard Burn Pit
FCH-031 Sewage Pumping Station
FTCH-025 - Bldg 130 TMC Silver Recovery Unit
21C (B421)
21B (B423)
Bldg 314 Former DDT Storage Area
Bldg 540 Pesticide Handling Area
21A (B262)
Bldg 1313 Former Dental Clinic
21G (B2055)
Fort Chaffee Airfield
21F (B470)
Bldg 2051 Photo Lab
Bldg 2104 Fire Station Storage
Bldg 1339 Current TMC
Bldg 477 Former Pesticide Storage and Mixing Building
Bldg 1393 Former Dental Clinic
Bldg 3911 POL, Paint and Former Pesticide Storage
Bldg 3621 Hospital Area
21D (B2454)
McMahan Lake
Willies Lake
Little Vache Grasse Creek
Grayson Creek
Vache Grasse Creek

6.0 CONCLUSIONS AND RECOMMENDATIONS

The PFAS PA at Fort Chaffee evaluated preliminary locations for the use, storage, and/or disposal of PFAS-containing materials, in accordance with the 2018 Army Guidance for Addressing Releases of PFAS (Army 2018). A combination of document review, internet searches, interviews with installation personnel, and an installation site visit were used to identify preliminary locations (potential AOPIs) of suspected use, storage, and/or disposal of PFAS-containing materials at Fort Chaffee.

Based on the results of the PA for the entire installation, 19 AOPIs were identified. Therefore, further investigation for PFAS at Fort Chaffee is warranted at this time. ***Table 6-1*** below summarizes the AOPIs identified at Fort Chaffee as well as sampling recommendations for each AOPI.

Table 6-1: Summary of Locations Identified During the PD, Recommendations & Rationale

Location Name	Identifier	AOPI	Recommendation	Rationale	Land Ownership
Original Fire Training Area	FTCH-022	Yes	Further study in SI	Interview statements indicate that AFFF was used in the area. During its time of operation, it was also historical common practice to use AFFF as an extinguishing material for fuel-based fires.	Transferred outside of Federal Government
New Fire Training Area	--	Yes	Further study in SI	Evidence of AFFF being utilized in this area includes interview statements and historical common practice of extinguishing materials for fuel-based fires to be AFFF during the period of use.	Transferred outside of Federal Government
Airfield Firefight and Rescue Station	Building 5850	Yes	Further study in SI	Historical common practice of nozzle testing or AFFF storage at fire stations.	Transferred outside of Federal Government
Primary Fire Station	Building 2100	Yes	Further study in SI	Historical common practice of nozzle testing or AFFF storage at fire stations.	BRAC Surplus to ARARNG
Central Cantonment Area Fire Station	Building 139	Yes	Further study in SI	Historical common practice of nozzle testing or AFFF storage at fire stations.	Transferred outside of Federal Government
Fire Station and Warehouse	Building 2360	Yes	Further study in SI	Historical common practice of nozzle testing or AFFF storage at fire stations.	BRAC Surplus to ARARNG
Northeast Cantonment Area Fire Station	Building 1852	Yes	Further study in SI	Historical common practice of nozzle testing or AFFF storage at fire stations.	Transferred outside of Federal Government

Location Name	Identifier	AOPI	Recommendation	Rationale	Land Ownership
Hospital Area Fire Station	Building 3799	Yes	Further study in SI	Historical common practice of nozzle testing or AFFF storage at fire stations.	BRAC Surplus to ARARNG
Oil/Water Separator Sludge Disposal Area	FTCH-033	Yes	Further study in SI	Sediments and sludge collected from vehicle wash rack troughs and related OWSs were spread evenly on the ground surface at the site.	Transferred outside of Federal Government
Sewage Treatment Lagoons	FTCH-011	Yes	Further study in SI	Wastewater from the silver recovery unit and vehicle washout near fire training areas was routed here for treatment.	Transferred outside of Federal Government
East Land Application Site	FTCH-043	Yes	Further study in SI	Impacted soil from the Fire Training Area being brought here for disposal.	BRAC Surplus to ARARNG
West Land Application Site	FTCH-044	Yes	Further study in SI	Impacted soil from the Fire Training Area being brought here for disposal.	Transferred outside of Federal Government
Arrowhead Landing Strip	--	Yes	Further study in SI	Current fire department procedure requires that AFFF be available for use during takeoff and landing procedures. There are no reported incidents of AFFF being utilized in response to a crash or fire. However, it is likely that AFFF was also made available for use during takeoff and landing procedures historically and it was historical common practice to conduct AFFF nozzle testing to prepare for potential fuel-based fire response at the area of staging.	BRAC Surplus to ARARNG
Rattlesnake Landing Strip	--	Yes	Further study in SI	Current fire department procedure requires that AFFF be available for use during takeoff and landing procedures. There are no reported incidents of AFFF being utilized in response to a crash or fire. However, it is likely that AFFF was also made available for use during takeoff and landing procedures historically and it was historical common practice to conduct AFFF nozzle testing to prepare for potential fuel-based fire response at the area of staging.	BRAC Surplus to ARARNG
Cantonment Area Heliports *4 Total*	--	Yes	Further study in SI	Current fire department procedure requires that AFFF be available for use during takeoff and landing procedures at the landing strips.	Transferred outside of Federal Government

Location Name	Identifier	AOPI	Recommendation	Rationale	Land Ownership
Cantonment Area Heliports *4 Total*			Further study in SI	These heliports are not currently utilized. There are no reported incidents of AFFF being utilized in response to a crash or fire. However, it is likely that AFFF was also made available for use during takeoff and landing procedures historically and it was historical common practice to conduct AFFF nozzle testing to prepare for potential fuel-based fire response at the area of staging.	Transferred outside of Federal Government
Fort Chaffee Airfield	--	Yes	Further study in SI	Current fire department procedure requires that AFFF be available for use during takeoff and landing procedures at the landing strips. This airfield no longer exists. There are no reported incidents of AFFF being utilized in response to a crash or fire. However, it is likely that AFFF was also made available for use during takeoff and landing procedures historically and it was historical common practice to conduct AFFF nozzle testing to prepare for potential fuel-based fire response at the area of staging.	Transferred outside of Federal Government
OB/OD Area	FTCH-020	No	No action at this time	No records of PFAS-containing munitions items were identified.	BRAC Surplus to ARARNG
Former ANG Burn Pit	FTCH-004	No	No action at this time	Interviews and physical records did not identify PFAS-containing materials as having been used, stored, or disposed of	BRAC Surplus to ARARNG
Troop Medical Clinic Silver Recovery Unit	FTCH-025	No	No action at this time	No spills of PFAS-containing materials indicated.	Transferred outside of Federal Government
X-Ray and Photograph Material Generators	--	No	No action at this time	No spills of PFAS-containing materials indicated. Any spills would not be absorbed into media.	Transferred outside of Federal Government
Fire Station Storage	--	No	No action at this time	Fire station storage building was installed following BRAC.	BRAC Surplus to ARARNG
Vehicle Wash Rack Drainage Ditches	FTCH-017	No	No action at this time	Wash racks were outfitted with oil/water separators prior to the earliest date that AFFF would have been potentially used on-post. As such, drainage ditches would not have received effluent impacted by AFFF (and therefore PFAS).	BRAC Surplus to ARARNG

Location Name	Identifier	AOPI	Recommendation	Rationale	Land Ownership
Sewage Pumping Station	FTCH-031	No	No action at this time	Material did not accumulate here but was rather conveyed to the Sewage Lagoons.	Transferred outside of Federal Government
Used Oil Satellite Storage Containers	FTCH-021	No	No action at this time	No confirmed spill response locations by Fire Department.	BRAC Surplus to ARARNG
Former DDT storage area	FTCH-009	No	No action at this time	Pesticides did not contain PFAS.	Transferred outside of Federal Government
Historic Pesticide Storage and Mixing Building	--	No	No action at this time	Pesticides did not contain PFAS.	Transferred outside of Federal Government
Pesticide Handling Area	FTCH-042A	No	No action at this time	Pesticides did not contain PFAS.	Transferred outside of Federal Government
Storage of POL, Paint and Former Pesticide	--	No	No action at this time	No documentation of Fire Department response to spill; pesticides did not contain PFAS.	Transferred outside of Federal Government
Oil/Water Separators and Attached Systems (22 locations throughout main cantonment area)	FTCH-034	No	No action at this time	Sampling at the water collection areas (FTCH-011 Sewage Treatment Lagoons and FTCH-033 Oil/Water Separator Sludge Disposal Area) is recommended prior to contemplating sampling at the rest of the wash rack and storm water management system.	BRAC Surplus to ARARNG

Data collected during the PA (**Sections 3** through **5**) were sufficient to draw conclusions and recommendations summarized above. The data limitations relevant to the development of this PA at Fort Chaffee are discussed below.

In the 25 years since the 1997 BRAC transfer event, most DoD personnel associated with the Active Army at Fort Chaffee had transferred to alternate assignments and/or retired or have passed away. Therefore, interviewees with recollections of historical site activities were typically unavailable. Additionally, the Active Army records from Fort Chaffee were transferred to other DoD facilities and pre-1997 environmental records were not available.

The infrastructure of Fort Chaffee has changed dramatically across its history, continuing after the 1997 BRAC land transfer. Much of the installation's infrastructure was left in disrepair before the recommendation for transfer. Furthermore, land which was redeveloped under the Fort

Chaffee Redevelopment Authority may be dramatically different than historically presented. For example, the Fort Chaffee Airfield and West Land Application Site (FTCH-044) have been completely demolished and redeveloped. Details of redevelopment are also unknown, including whether soil excavation was conducted, how deep soil may have been excavated, and where excavated soil was disposed of.

Records gathered for the use, storage and/or disposal of PFAS-containing materials were reviewed during the PA process. Documentation specific to AFFF may have been limited (e.g., each AFFF use; procurement records, documentation of AFFF used during crash responses or fire training activities) due to lack of recordkeeping requirements for the full timeline of common AFFF practices. Anecdotal accounts of AFFF use (and therefore likely PFOS, PFOA, and PFBS use) were limited to available installation personnel, whose knowledge of AFFF use may have been restricted by their time spent at the installation or previous roles held that limited their relevant knowledge of potential AFFF (or other PFAS-containing material) use.

A comprehensive well survey was not completed as part of this PA; therefore, the information reviewed regarding off-post wells is limited to what is contained in the off-post well search results (***Appendix D***).

The searches for ecological receptors and off-post PFAS sources were not exhaustive and were limited to easily identifiable and readily available information evaluated during the relevant records review, installation personnel interviews, and site reconnaissance.

Following the PA evaluation, 19 AOPIs were identified. Therefore, further investigation of PFAS in a site investigation at Fort Chaffee is warranted at this time.

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