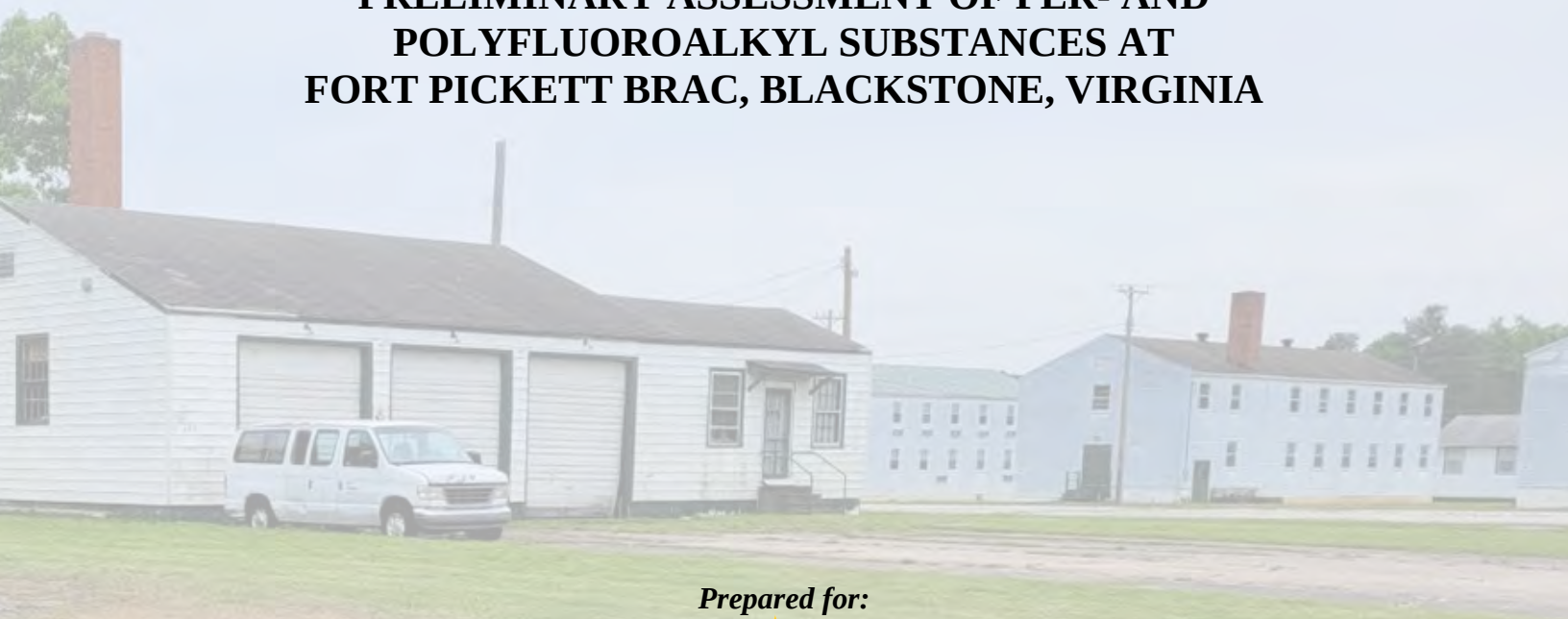
PRELIMINARY ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES AT FORT PICKETT BRAC, BLACKSTONE, VIRGINIA



Prepared for:

U.S. ARMY

ODCS, G-9, ISE BRAC

Final

November 2023

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LIST OF ACRONYMS AND ABBREVIATIONS

AFFF	Aqueous Film-Forming Foam
amsl	Above Mean Sea Level
AOI	Area of Interest
AOPI	Area of Potential Interest
Army	U.S. Army
BCT	BRAC Cleanup Team
bgs	Below Ground Surface
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COI	Constituent of Interest
CSM	Conceptual Site Model
DERP	Defense Environmental Restoration Program
DEQ	Department of Environmental Quality
DoD	U.S. Department of Defense
DPW	Department of Public Works
EBS	Environmental Baseline Survey
EDR	Environmental Data Resources, Inc.
FASTC	Foreign Affairs Security Training Center
FOST	Finding of Suitability to Transfer
FS	Feasibility Study
FTA	Fire Training Area
HFPO-DA	Hexafluoropropylene Oxide Dimer Acid (aka GenX)
HQ	Hazard Quotient
IPaC	Information for Planning and Consultation
LHA	Lifetime Health Advisory
LRA	Local Redevelopment Authority
LTM	Long-Term Monitoring
LUC	Land Use Control
MetalSpray	MetalSpray North America
MTC	Maneuver and Training Center
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
ODW	Office of Drinking Water
OSD	Office of the Secretary of Defense
P.E.	Professional Engineer
P.G.	Professional Geologist
PA	Preliminary Assessment
PFAS	Per- and Polyfluoroalkyl Substances
PFBA	Perfluorobutanoic Acid
PFBS	Perfluorobutane Sulfonate
PFHpA	Perfluoroheptanoic Acid
PFHxA	Perfluorohexanoic Acid
PFHxS	Perfluorohexane Sulfonate
PFNA	Perfluorononanoic Acid
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonate
ppb	Parts per Billion
ppt	Parts per Trillion

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

PMP	Project Management Professional
QA	Quality Assurance
RCRA	Resource Conservation and Recovery Act
REM	Registered Environmental Manager
RfD	Reference Dose
RI	Remedial Investigation
RSL	Regional Screening Level
SDS	Safety Data Sheet
SDWA	Safe Drinking Water Act
SI	Site Inspection
SL	Screening Level
T&E	Threatened and Endangered
U.S.C.	United States Code
UCMR3	Third Unregulated Contaminant Monitoring Rule
UCMR5	Fifth Unregulated Contaminant Monitoring Rule
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VAARNG	Virginia Army National Guard
Virginia Tech	Virginia Polytechnic Institute and State University
VDH	Virginia Department of Health
VPDES	Virginia Pollutant Discharge Elimination System
WWII	World War II
WWTP	Wastewater Treatment Plant

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 and conduct the PA in accordance with the 2018 *Army Guidance for Addressing Releases of Per- and Polyfluoroalkyl Substances* (U.S. Army 2018). A PA for PFAS-containing materials with a focus on perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), perfluorobutanoic acid (PFBA), perfluorobutane sulfonate (PFBS), perfluorononanoic acid (PFNA), perfluorohexanoic acid (PFHxA), perfluorohexane sulfonate (PFHxS), and hexafluoropropylene oxide dimer acid (HFPO-DA) and its ammonium salt ("GenX" chemicals) was completed for the Base Realignment and Closure (BRAC) property at the former Fort Pickett, to assess potential PFAS release areas and exposure pathways. The entire Fort Pickett facility was selected for closure under BRAC, and all property has been retained or conveyed. The majority of the property (approximately 42,000 acres) was retained by the U.S. Army (Army) under Virginia Army National Guard (VAARNG) control (i.e., VAARNG property). The remaining transferred property at Fort Pickett, which is the focus of this report, is located on 2,873 acres of land in Nottoway County, Virginia, and will be referred to as the BRAC property for the purposes of this report. The completion of this PA included the execution of the following tasks:

- Conducted a kickoff meeting with the BRAC Office and the U.S. Army Corps of Engineers (USACE) on June 21, 2021, to present all parties' preliminary knowledge of the former Fort Pickett and provide information to guide the PA and site visit.
- Reviewed available records (e.g., aerial photography, historical maps, technical reports, previous studies, investigations) from online sources (i.e., Internet-based searches), environmental investigations and/or regulatory programs and internal Army documents from the Administrative Record. In addition, an Environmental Data Resources, Inc. (EDR) Report for the former Fort Pickett and any listed sites within and up to a 2-mile search distance was conducted.
- Conducted a 2-day site visit on May 5 and 6, 2022, to identify potential sources of PFAS and gather information for developing conceptual site models (CSMs) at AOPIs.
- Interviewed individuals with historical and present-day knowledge of operations on the BRAC property.
- Identified AOPIs and developed preliminary CSMs for pathways of potential PFAS in soil, groundwater, surface water, and sediment.

In conducting the PA of the BRAC property at the former Fort Pickett, three 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 BRAC property only. Based on the potential PFAS releases at the AOPIs, the potential exists for exposure to PFAS contamination in soil and groundwater. In addition, the potential exists for off-post exposure in groundwater, 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 Inspection (SI).

1. INTRODUCTION

The U.S. Army (Army) conducted this Preliminary Assessment (PA) to investigate the potential presence of per- and polyfluoroalkyl substances (PFAS) at the former Fort Pickett in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, 42 United States Code [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 Code of Federal Regulations [CFR] Part 300); and guidance documents developed by the U.S. Environmental Protection Agency (USEPA) and the Department of the Army. The former Fort Pickett is not on the National Priorities List (NPL), and the 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 Pickett based on the use, storage and/or disposal of potential PFAS-containing materials, in accordance with the *Army Guidance for Addressing Releases of Per- and Polyfluoroalkyl Substances* (U.S. Army 2018). This PA was conducted in general accordance with 40 CFR §300.420(b), the USEPA *Guidance for Performing Preliminary Assessments Under CERCLA* (USEPA 1991) and the 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 PFAS-containing materials and identify areas where these materials were stored, handled, used, or disposed of at the former Fort Pickett.

The entire Fort Pickett was selected for the Base Realignment and Closure (BRAC), and the property is generally divided into two segments: 1) land retained by the Army under Virginia Army National Guard (VAARNG) command and control, and 2) conveyed or transferred property. The conveyed Fort Pickett property was evaluated for this PFAS PA. For the purposes of this report, the conveyed property in question will be referred to as the BRAC property, BRAC property operated by VAARNG will be referred to as the VAARNG property, and both BRAC properties will be referred to as Fort Pickett. Fort Pickett is located in Blackstone, Virginia, as shown in Figure 1-1.

1.1 PFAS BACKGROUND INFORMATION

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), perfluorobutanoic acid (PFBA), perfluorobutane sulfonate (PFBS), perfluorononanoic acid (PFNA), perfluorohexanoic acid (PFHxA), 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 eight PFAS compounds together, and for the purposes of this PA, are referred to in this report as "Target PFAS."

Fort Pickett was evaluated for all potential use, storage, and/or disposal of PFAS-containing materials. A variety of PFAS-containing materials are 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 U.S. Department of Defense (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 (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, some pesticide use, automobile maintenance shops, photographic processing facilities, laundry/waterproofing facilities, car washes, stormwater or sanitary sewer components, and biosolid application areas.

Many PFAS 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 2020b). 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 was 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, 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 2020c).

1.2 PURPOSE AND 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 locations at Fort Pickett 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 areas of potential interest (AOPIs) related to PFAS.

1.3 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 an LHA level for PFOS and PFOA (individually or combined) of 70 ng/L (USEPA 2016).

In October 2019, the Office of the Secretary of Defense (OSD) issued guidance on investigating PFOS, PFOA, and PFBS at DoD restoration sites. The OSD guidance provided risk screening levels (SLs) for PFOS, PFOA, and PFBS in (groundwater) tap water and soil, based on the USEPA regional screening level (RSL) calculator for residential and industrial reuse and using the oral reference dose (RfD) of 2E-05 mg/kg-day. These SLs are used during the SI to determine if further investigation in a Remedial Investigation (RI) is warranted.

In April 2021, USEPA released an updated toxicity assessment for PFBS. USEPA developed chronic (0.0003 mg/kg-day) and subchronic (0.001 mg/kg-day) RfDs for PFBS as part of USEPA's toxicity

assessment. The RSL for PFBS was previously calculated using the RfD of 0.02 mg/kg day. New toxicity values resulted in revisions to the RSLs for PFBS in May 2021 (USEPA 2021).

In September 2021, OSD issued a revision to *Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program* (DoD 2021). The revised memorandum accounts for the updated PFBS SLs attributable to USEPA's reassessment of PFBS toxicity in 2021. Based on USEPA research, the RSLs for PFOS and PFOA are calculated using an RfD of 2E-05 mg/kg-day. The RSL for PFBS is calculated using an RfD of 3E-04 mg/kg-day. When multiple PFAS are encountered at a site, a 0.1 factor is applied to the SL when it is based on noncarcinogenic endpoints.

In May 2022, based on continued evaluation of Target PFAS by the Agency for Toxic Substances and Disease Registry and the USEPA Office of Water, USEPA provided new SLs for PFOA, PFOS, PFNA, PFHxS, and HFPO-DA.

In July 2022, OSD issued a policy memorandum adopting these new SLs to be used during the SI phase to determine whether further investigation in an RI is warranted. This revised guidance was in effect as of July 2022 and was applicable to investigating PFOS, PFOA, PFBS, PFNA, PFHxS, and HFPO-DA at DoD restoration sites, including BRAC (DoD 2022). In August 2023, OSD issued a memorandum to account for the May 2023 USEPA RSLs for PFBA and PFHxA in addition to the RSLs for the other six PFAS (DoD 2023). The SLs for Target PFAS are listed in Table 1-1. Currently, no legally enforceable Federal standards exist for PFAS in groundwater, surface water, soil, or sediment.

Table 1-1. Screening Levels from the 2023 OSD Memorandum

Chemical	Residential Tap Water HQ = 0.1 (ng/L or ppt)	Residential Soil HQ = 0.1 (µg/kg or ppb)
HFPO-DA (GenX)	6	23
PFBA	1,800	7,800
PFBS	600	1,900
PFHxA	990	3,200
PFHxS	39	130
PFNA	5.9	19
PFOA	6	19
PFOS	4	13

Note: The Residential Tap Water Screening Levels are used to evaluate groundwater and surface water data. The Residential Soil Screening Levels 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 or the LHA 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 contamination (U.S. Army 2018).

1.4 PA METHODOLOGY

The PA for the Fort Pickett BRAC property included a site visit, aerial photographic analysis, records review, and interviews that were conducted in accordance with the methods detailed in the Programmatic PA Work Plan (Leidos 2021). The Programmatic PA Work Plan outlines the approach and methodology for conducting the PFAS PA. As detailed in the Work Plan, the PA activities focused on ascertaining and documenting the following information regarding PFAS history and usage at Fort Pickett:

- 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, such as metal 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 the Fort Pickett BRAC property.

The data gathered during PA activities are summarized in Section 3.

1.5 REPORT ORGANIZATION

The contents of this PA Report are summarized below:

- ***Section 2. Site Background***—This section presents site-specific information related to site operational history and discusses the environmental setting. Demographics, land use, topography, geology, hydrogeology, hydrology, groundwater, potable wells, ecological receptors, and climate are described.
- ***Section 3. PA Analysis***—This section provides observations and results from the PA site visit, aerial photographic analysis, records review, and interviews.
- ***Section 4. Summary of PA Data***—This section provides an overview of the data collected during the PA for the different potential PFAS sources.
- ***Sections 5. Summary of PA Results***—This section synthesizes the data gathered from the PA activities and determines whether each area evaluated during the PA is an AOPI or was not retained as an AOPI.
- ***Section 6. Conclusions***—This section presents conclusions of the PA.
- ***Section 7. References—***This section lists the references that were used in the preparation of this report.
- ***Appendices***—Appendices A through F include data from field activities or related assessments:
  - Appendix A. Final Fort Pickett Kickoff Meeting Minutes
  - Appendix B. Documents/Sources Reviewed During PA
  - Appendix C. Aerial Photographs
  - Appendix D. Site Visit Photographs
  - Appendix E. Interview Notes
  - Appendix F. Environmental Data Resources, Inc. (EDR) Report.

2. SITE BACKGROUND

2.1 SITE LOCATION

Fort Pickett is a former combat training facility that encompassed approximately 45,000 acres at the time of closure (U.S. Army 2020). Located at 1729 Military Road, Blackstone, Virginia, Fort Pickett is approximately 40 miles southwest of downtown Richmond and immediately east of the town of Blackstone. The majority of Fort Pickett is in the eastern portion of Nottoway County, adjacent to Blackstone; however, southern reaches of the installation are in Brunswick County and eastern reaches are in Dinwiddie County (Matrix 2021). The BRAC property evaluated for this PA is located entirely within Nottoway County. Figure 2-1 depicts the Fort Pickett site features.

2.2 SITE OPERATIONAL HISTORY

Prior to inception, Fort Pickett was primarily agricultural lands (USACE 1997). Fort Pickett was purchased by the U.S. Government in 1941 and activated as the Blackstone Military Area (Woodward Clyde 1997). In late 1941, it was dedicated as Camp Pickett as a 46,000-acre Army installation and has primarily been used for military training operations since its inception. Air transportation to and from Camp Pickett became possible in late 1942 upon completion of the Blackstone Army Airfield (U.S. Army 2020).

During World War II (WWII), the camp housed a peak number of troops (85,000 circa 1943) and had 1,600 buildings in the cantonment area. Camp Pickett had four 5,000-foot-long airplane runways, 37 miles of paved roads, 125 miles of secondary roads, and 11 miles of railroad. Part of Camp Pickett was also designated as a prisoner-of-war camp (Woodward Clyde 1997).

After WWII, Camp Pickett's mission was redefined for essential training purposes (U.S. Army 2020). The Army discontinued combat training at the camp in the fall of 1944 and closed the facility at the end of WWII. The installation reopened for several short time periods prior to being fully reactivated in 1950 at the beginning of the Korean War as a medical replacement Army training center (Woodward Clyde 1997). By 1960, areas of Camp Pickett were remodeled to support visiting battalions for specialized training maneuvers, including but not limited to, U.S. Army National Guard and Reserve units, Navy, and Marine Corps personnel. Camp Pickett was redesignated as Fort Pickett in 1974 as a full-time training facility for active and Reserve Component forces (U.S. Army 2020).

In 1995, Fort Pickett was selected by the BRAC Commission and began undergoing closure except for minimum essential training areas and facilities. As a result, VAARNG assumed command and control of the installation on October 1, 1997. Between 1998 and 2005, 2,873 acres of BRAC property were transferred to Nottoway County and the Virginia Polytechnic Institute and State University (Virginia Tech) Southern Piedmont Agricultural Research and Extension Center; subsequently, VAARNG retained approximately 42,000 acres (U.S. Army 2020).

2.3 DEMOGRAPHICS, PROPERTY TRANSFER, AND LAND USE

Fort Pickett is located directly east of Blackstone and is in Nottoway, Brunswick, and Dinwiddie Counties. Except for the eastern portion, Fort Pickett is surrounded by rural areas primarily composed of forested and agricultural lands. The land between Fort Pickett and downtown Blackstone is zoned primarily for agriculture, conservation, and rural/urban residential. Blackstone is predominantly residential and zoned for light, medium, and heavy residential land uses with smaller zoned areas for residential/suburban and residential/business (Matrix 2021). The BRAC property lies exclusively in Nottoway County, and Blackstone is the only adjacent town. The population of Blackstone and Nottoway County at the time of the 2020 Census was 3,352 and 15,642, respectively (U.S. Census Bureau 2021).

The land that encompasses Fort Pickett is generally divided into two segments and includes the VAARNG property (approximately 42,000 acres) and the BRAC property (approximately 2,873 acres). Currently, the

VAARNG property of Fort Pickett (redesignated Fort Barfoot on March 24, 2023) is used year-round as a maneuver and training center (MTC), and the land use is not expected to change (AECOM 2020). The VAARNG property includes approximately 678 acres of the Allen C. Perkinson Airport/Blackstone Army Airfield (herein referred to as the Airfield). In addition, the Navy leases approximately 158 acres from VAARNG for training purposes (Matrix 2021).

In 2015, approximately 1,400 acres within the installation boundary were leased to the U.S. State Department to construct the Foreign Affairs Security Training Center (FASTC). Of the 1,400 acres, approximately 626 acres are leased from VAARNG and approximately 727 acres of BRAC property were purchased from Nottoway County (Matrix 2021).

Between October 15, 1998, and April 1, 2005, 2,873 acres of property were conveyed to Nottoway County and Virginia Tech Southern Piedmont Agricultural Research and Extension Center and now make up the BRAC property (Matrix 2021, U.S. Army 2020). According to the Fort Pickett Local Redevelopment Authority (LRA) and Nottoway County database, since the initial property conveyance to Nottoway County and Virginia Tech Southern Piedmont Agricultural Research and Extension Center, numerous parcels have been transferred to other owners (Nottoway GIS 2022). Figure 2-2 summarizes the current BRAC property parcel ownership at Fort Pickett.

The FASTC and Pickett Park business complex occupy most of the area within the BRAC property boundary. The State Department's FASTC facility trains personnel on antiterrorism and security requirements and uses most of the southern BRAC property. Numerous small businesses use the northeastern BRAC portion for community support functions and educational and training purposes (Matrix 2021).

The town of Blackstone assumed ownership of the water and wastewater treatment facilities in 1996 and 2000, respectively (Matrix 2021); however, Blackstone assumed operational control of the WWTP in 1995 (Woodward Clyde 1997). Blackstone is responsible for operations and maintenance of the WWTP and provides services to Fort Pickett in addition to the town. The freshwater and wastewater treatment facilities are part of the BRAC property. Furthermore, Blackstone owns approximately 33 acres of the Airfield (Matrix 2021).

Land use controls (LUCs) are in place at the Former Recycling Center and Former Fuel Station No. 1 within the BRAC property. LUCs at the Former Recycling Center were implemented as part of the final Remedial Assessment (Tetra Tech 2005) and follow the Finding of Suitability to Transfer (FOST) the Army provided (U.S. Army 2005a). These LUCs include groundwater, residential reuse, and excavation or soil disturbance restrictions and affect approximately 21 acres of the BRAC property. LUCs for the Former Fuel Station No. 1 are provided in the FOST (U.S. Army 2005b) and included in the deed (USACE 2005). The entire Former Fuel Station parcel (approximately 1.5 acres) is subject to groundwater use and ground disturbance restrictions. All current and post-transfer use by future property owners and users are responsible for implementing, monitoring, and maintaining the LUCs at Fort Pickett (Tetra Tech 2005). LUCs at the BRAC property of Fort Pickett are presented in Figure 2-3.

2.4 TOPOGRAPHY

Fort Pickett is located in the Piedmont upland section of the Piedmont physiographic province where topography typically consists of low, well-rounded hills and long, northeast trending valleys and ridges. The Piedmont province typically consists of gentle slopes where valley bottoms and sides, hillsides, and hilltops merge and are absent of a distinct break in slopes (USACE 1997).

The topography at Fort Pickett is characterized by low, gently rolling terrain with generally level uplands dissected by stream drainages. The northwestern portion of the facility exhibits dendritic drainage patterns and is considered level upland, while the southeastern region shows more relief with deeply dissected topography with steeper slopes and ravines (AECOM 2020). Elevation on Fort Pickett ranges from

approximately 450 feet above mean sea level (amsl) in the uplands to approximately 200 feet amsl along the Nottoway River to the south (Matrix 2021).

2.5 GEOLOGY

Fort Pickett lies in the Piedmont upland section of the Piedmont physiographic province, extending northeast to southwest across Virginia, and is bounded by the Blue Ridge Province to the west and the Coastal Plain Province to the east (Woodward Clyde 1997). The Piedmont physiographic province is underlain by igneous, metamorphic, and sedimentary bedrock ranging in age from Precambrian to Mesozoic. Bedrock includes massive granites and gneisses, foliated phyllites and schists, and consolidated sandstones. Metamorphic rocks predominate the crystalline rock regimes. In most places, the consolidated rocks are overlain by regolith (USACE 1997).

A layer of weathered metamorphic and igneous rock (saprolite) extends across Fort Pickett. From ground surface, a typical sequence at the installation includes a thin layer of soil, a highly variable saprolite deposit that could be up to 45 feet thick, followed by bedrock. Alluvial deposits have been noted in the floodplains of Fort Pickett's drainage systems; however, the similar grain sizes between the saprolite and alluvial deposits make differentiation difficult (AECOM 2020). Alluvial deposits of sand, silt, and clay occur in the floodplains of the principal drainages, such as the Nottoway River, Tommeheton Creek, Birchin Creek, and Hurricane Branch (Woodward Clyde 1997).

The soils at Fort Pickett are deep, well-drained, coarse to fine silty clayey sands. These soils consist of moderately fine- to fine-grained soils formed from weathered granite and granite gneiss. The soils are strongly acidic and low in organic matter. The profile of the soil is generally a pale-yellow to brownish yellow coarse to fine silty clayey sand with a reddish yellow to yellowish-red friable silty clay subsoil in some places. Some areas have a surface layer of gritty silty sandy clay scattered with small, angular quartz pebbles. Permeability is moderately rapid in the surface layer of the soil and moderate in the subsoil. There is medium internal drainage with a moderate capacity for holding available moisture. Surface runoff is slow, and the hazard of erosion is slight to moderate. The potential for frost development in the soil extends to a depth of 18 inches in the Fort Pickett site area (USACE 1997).

Petersburg granite with Maidens Gneiss are the primary bedrock units underlying Fort Pickett at variable depths (USACE 1997). A layer of saprolite overlies the granite and metamorphic rocks throughout most of the installation. Bedrock grades upward starting with undeformed basement, then a thin zone of fractured rock, a variable layer of saprolite, and finally a thin layer of soil. The saprolite thickness and the associated bedrock surface are highly irregular. Rock can be present at the ground surface or be as deep as 45 feet below ground surface (bgs) (Woodward Clyde 1997); however, it has been reported that depth to unweathered bedrock in some place may be up to 150 feet bgs (USACE 1997). Saprolite is generally clay-rich and of low permeability, with the clay fraction increasing upward from the parent bedrock (Woodward Clyde 1997).

2.6 HYDROGEOLOGY

The yield of wells in the Piedmont physiographic province is greatly impacted by the abundance of fractures within the bedrock. Because fractures act as conduits for the flow of groundwater, well yields are greatest where wells intersect large or numerous fractures. The formations of granite and gneiss have good water-bearing potential because they are highly weathered and contain many fissures or closely spaced joints. Bored wells in the vicinity of Fort Pickett, are generally less than 50 feet deep, and drilled wells are normally greater than 60 feet deep (USACE 1997).

Groundwater systems within the Piedmont province include a combination of saprolite and fractured bedrock occurrences. Groundwater at Fort Pickett may occur in a multi-aquifer system, with water-producing zones in local silt, sand, and/or gravel lenses; broken rock, gravel, sand, silt, and clay within the saprolite; and perhaps in fractures within the bedrock. These water-producing zones may be separated both

laterally and vertically by impermeable sediments, unfractured rock, or differentially weathered rock. The original rock texture is generally impermeable (AECOM 2020).

Precipitation infiltrates into water-producing zones and recharges the water table aquifer. A component of groundwater flows horizontally, while another component flows vertically downward through interconnected fractures in the underlying bedrock aquifers. The shallow water table aquifer is presumed to be unconfined. Therefore, groundwater flows under the influence of gravity with flow patterns resembling a subdued reflection of local topography. It is assumed that groundwater discharges to local streams in the area. The general shallow groundwater flow direction across the entire facility likely follows topography and ranges from northwest to southeast. For deeper aquifers, groundwater is under the influence of the presumed controlling hydraulic head for the region, namely the Nottoway River. Deep groundwater may underflow small streams and tributaries at the facility, but it will ultimately discharge to the Nottoway River (AECOM 2020). Regionally, groundwater at Fort Pickett flows in a southeasterly direction toward the Nottoway River.

A study conducted in 1989 showed depth to groundwater ranges from 7 to 33 feet bgs at Fort Pickett (Woodward Clyde 1997). The water table begins to fall in April and is replenished in the winter months. Most of the natural springs on Fort Pickett occur at the head of major drainages and are associated with seepage wetlands (AECOM 2020).

2.7 SURFACE WATER HYDROLOGY

The Nottoway River drainage basin overlies the majority of Fort Pickett, including the entirety of the BRAC property. A small area in the northeastern corner of the installation drains to Butterwood Creek. Three tributaries dissect Fort Pickett that drain into the Nottoway River: Hurricane Branch, Birchin Creek, and Tommeheton Creek. Principally, the headwaters of these tributaries originate within the installation's boundaries. Surface water generally flows south to the Nottoway River, drains into the Blackwater River at the Virginia/North Carolina border, and terminates into the Albemarle Sound in North Carolina (AECOM 2020).

The streams at Fort Pickett partly originate as groundwater discharge from shallow aquifers; however, some stream segments recharge the aquifer. Many portions of the streams are slow moving and marshy, forming extensive wetlands (AECOM 2020). The Nottoway River Basin contains 10,000 acres of wetlands with high value and high priority for protection spread over seven counties. In addition, the U.S. Fish and Wildlife Service (USFWS) has identified several detached wetlands of various sizes as having high value and priority for protection (Dewberry & Davis 2009).

Of the major stream networks on Fort Pickett (i.e., Nottoway River; Hurricane Branch; and Tommeheton, Birchin, and Butterwood Creeks), Hurricane Branch and Tommeheton and Birchin Creeks drain into the Nottoway River within the boundaries of Fort Pickett. Butterwood Creek eventually drains into the Nottoway River farther downstream from the installation (AECOM 2020). These Nottoway River tributaries are fed by a dendritic system of perennial and intermittent streams (USACE 1998).

The predominant discharge of surface water drainage of the BRAC property is Hurricane Branch, including most of FASTC, Fort Pickett LRA, and waste and freshwater treatment plant properties. Pickett Park predominantly drains to Birchin Creek, and the area north of the Airfield drains to Tommeheton Creek.

Fort Pickett has approximately 13 lakes, ponds, and surface water impoundments (approximately 600 acres). The largest impoundment, the Nottoway Reservoir, is in the southwestern corner of the installation and covers approximately 384 acres in water surface area. The Nottoway Reservoir is impounded on the Nottoway River, upgradient of the Fort Pickett drainage system, and is owned by Blackstone (AECOM 2020). Smaller bodies of water on the installation include Twin Lakes on Butterwood Creek, Birchin Lake on Birchin Creek, and Tommeheton Lake on Tommeheton Creek (Weston 2001).

2.8 WATER USAGE

The Nottoway Reservoir, which the town of Blackstone owns, is the source of drinking water for the BRAC property, VAARNG property, Blackstone, and several private residences within a 4-mile radius of the installation boundary. The Nottoway Reservoir is located within the installation boundary near the southwestern corner and cross-gradient of most of Fort Pickett. The next nearest surface water intake downstream from the operational range boundary is on the Nottoway River, approximately 30 miles downstream from the Nottoway River's operational range exit point (AECOM 2020). Multiple communities receive water from impoundments of tributaries to the Nottaway River; however, the water systems are not interconnected (Dewberry & Davis 2009).

Water drawn from the Nottoway Reservoir is treated at a freshwater treatment plant located approximately 4 miles northeast of the Reservoir and adjacent to the Blackstone WWTP in the Fort Pickett cantonment area (USACE 1998). Blackstone owns and operates the freshwater treatment plant and WWTP (Matrix 2021), and Blackstone and Fort Pickett (i.e., BRAC and VAARNG properties), as well as several private residences, share services. In addition to the plant, water distribution mains, three elevated storage tanks, and three pumping stations are located throughout the area within the boundaries of Fort Pickett (AECOM 2020). Both treatment plants are part of the BRAC property as shown in Figure 2-1.

No drinking water wells exist at Fort Pickett (i.e., BRAC and VAARNG properties). According to the Commonwealth of Virginia's Geology and Mineral Resources Energy Program, several domestic, industrial, public, government, and unknown use wells are located within 4 miles of the facility to the west, north, and southeast. These wells are primarily cross-gradient and upgradient of the installation. Only one domestic well was identified southeast of the installation boundary along the Nottoway River. The well is reportedly 310 feet deep, and its current status is unknown. Groundwater flow beneath Fort Pickett is locally a subdued reflection of topography and controlled by numerous surface water features on the installation. Regionally, groundwater flows in a southeasterly direction toward, and ultimately into, the Nottoway River, where it exits the installation boundary in the southeastern corner (AECOM 2020). Unregistered domestic wells associated with the residences surrounding Fort Pickett possibly exist that are not included in the Commonwealth of Virginia databases. Figure 2-4 depicts the potable wells within a 4-mile radius of Fort Pickett. The EDR report did not identify any public supply wells within 1 mile of Fort Pickett's northwestern boundary (EDR 2021).

2.9 ECOLOGICAL PROFILE

A variety of habitats are found at Fort Pickett: woods, mowed fields and lawns, agricultural fields, fallow fields, wetlands, permanent and intermittent streams, lakes, ponds, springs, seeps, and open unvegetated land. The most prevalent habitats at Fort Pickett include dry oak-pine forest (33.7 percent), southern piedmont mesic forest (31.0 percent), developed habitat (10.9 percent), and shrubland/grassland (10.2 percent) (Klopfer and Kane 2017).

The overall flora of Fort Pickett contains numerous species that are widely distributed in eastern North America, such as loblolly pine (*Pinus taeda*), sweetgum (*Liquidambar styraciflua*), American holly (*Ilex opaca*), and southern red oak (*Quercus falcata*). Fort Pickett lies within the Oak-Pine region and includes thousands of acres of secondary forests and scrubby vegetation growing on abandoned fields and clear cuts. The composition of these communities ranges from nearly pure stands of pine to variable mixtures of fast-growing, light-demanding deciduous trees, shrubs, and vines. Less than 100 acres of Fort Pickett can be characterized as old growth hardwood forests (USACE 1998).

The diverse landscapes on Fort Pickett provide numerous habitats for many animals common to the southeastern piedmont and coastal plain. The Nottoway River serves as an aquatic habitat for several species of native mussels, including the eastern floater (*Pyganodon cataracta*), notched rainbow (*Villosa constricta),* squawfoot (*Strophitus undulatus*), yellow lance (*Ellipitio lanceolata*), and Atlantic pigtoe (*Fusconaia masoni*)

(Carey, Wolf, and Emrick 2017). Although it has not been documented, the federally endangered dwarf wedgemussel (*Alasmidonta heterodon*) may exist on Fort Pickett, as it has historically occurred in the upper Nottoway River both upstream of and downstream from the installation (Carey, Wolf, and Emrick 2017). Several lakes and ponds are on the property. The largest surface water body (Nottoway Reservoir) is a 384-acre impoundment of the Mainstem Nottoway River located in Nottoway and Brunswick Counties. The reservoir provides a warm water fishery for largemouth bass (*Micropterus salmoides)*, bluegill (*Lepomis macrochirus*), redear sunfish (*L. microlophus*), black crappie (*Pomoxis nigromaculatus*), and channel catfish (*Ictalurus punctatus*) (VA DWR 2022). Jurisdictional wetlands have been identified along Tommeheton Creek, Birchin Creek, Butterwood Creek, Long Branch, and other drainage pathways (NWI 2022). Fort Pickett has approximately 5 acres of jurisdictional wetlands, and based on recent land cover mapping, the installation may contain additional areas of wetlands (Matrix 2021).

Birds typical of the piedmont and coastal plain constitute the primary avian population at Fort Pickett. Common birds that inhabit Fort Pickett include chipping sparrow (*Spizella passerine*), brown-headed cowbird (*Molothrus ater*), mourning dove (*Zenaida macroura*), and common grackle (*Quiscalus quiscula*) (eBird 2022). Common mammals that inhabit Fort Pickett include the white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyn lotor*), muskrat (*Ondatra zibethica*), and beaver (*Castor canadensis*). Beaver populations at Fort Pickett are active along major secondary streams on the VAARNG property, causing alterations to pond and stream hydrology throughout the area (USACE 1998).

A wide variety of reptiles and amphibians are found on Fort Pickett including, but not limited to, the spotted salamander (*Ambystoma maculatum*), Fowlers toad (*Anaxyrus fowleri*), northern cricket frog (*Acris crepitans*), eastern painted turtle (*Chrysemys picta picta*), and eastern hognose snake (*Heterodon platirhinos*) (Smith 2017, USACE 1998).

The USFWS Environmental Conservation Online System Information for Planning and Consultation (IPaC) tool identified five threatened and endangered (T&E) species (one mammal, one fish, two clams, and one flowering plant) potentially occurring on Fort Pickett (USFWS 2022). The T&E-listed species consist of the northern long-eared bat (*Myotis septentrionalis*), Roanoke logperch (*Percina rex*), Atlantic pigtoe (Fus*conaia masoni*), yellow lance (*Elliptio lanceolata*), and Michaux's sumac (*Rhus michauxii*). In addition, the IPaC tool identified one candidate species under the Endangered Species Act, the monarch butterfly (*Danaus plexippus*), as potentially occurring on the property (USFWS 2022). All of these T&E species have been documented at Fort Pickett (Chazal et al. 2004, Klopfer and Kane 2017, USACE 1998). The Atlantic pigtoe and yellow lance mussels and Roanoke logperch fish are found in portions of the Nottoway River on Fort Pickett (Matrix 2021). Critical habitat for the two mussel species (Atlantic pigtoe and yellow lance) is present within Fort Pickett. Seventy-five populations of Michaux's sumac, which USFWS lists as endangered, are scattered throughout Fort Pickett. Fort Pickett has the largest population of this species in the world, and almost all populations of the installation's Michaux's sumac are located within or on the border of the VAARNG property (USACE 1998).

2.10 CLIMATE

The climate at Fort Pickett is characterized as humid sub-tropical, with hot, humid summers and mild winters (AECOM 2020). The Blue Ridge Mountains to the west are a partial barrier to the cold continental air masses in the winter. The open waters of the Chesapeake Bay and Atlantic Ocean to the east contribute to the mild winters and humid summers (USACE 1997).

Rainfall occurs throughout the year but typically experiences the highest totals in September with an average of 3.6 inches. Snowfall typically occurs between November and March, with the most snowfall occurring in February. The temperature in Blackstone typically varies between 29 and 89°F annually, with the warmest temperatures occurring in July at average highs of 89°F. The warmer months of May to September cause the region to experience extreme seasonal variation in humidity. January is typically the coldest month, with average high and low temperatures of 49 and 30°F, respectively (Weather Spark 2022).

3. PA ANALYSIS

The primary components of the PA are records reviews, analysis of aerial photographs, a site visit, and interviews. The following sections summarize the methods used and activities conducted for the Fort Pickett BRAC property PA. A PFAS PA (AECOM 2020) and SI (AECOM 2022) have already been completed for the VAARNG property. The references to "on-post" refer to property that has been or still is owned by the Army. Any references to off-post refer to areas that have never been owned by the Army.

3.1 RECORDS REVIEW

Prior to the records review, site visit, and interviews, a kickoff meeting was held between the BRAC Office, the U.S. Army Corps of Engineers (USACE), and Leidos on June 21, 2021. The kickoff meeting was conducted to present all parties' preliminary knowledge of Fort Pickett and provide information to guide the PA and site visit. The final kickoff meeting minutes are presented in Appendix A.

Preliminary research was conducted prior to the site visit to determine if any of the following activities were conducted at the Fort Pickett BRAC property, which may indicate whether there was use, storage, or disposal of PFAS-containing materials during operations at Fort Pickett:

- On-post fire training
- Use of PFAS-based AFFF in fire suppression systems or other systems
- AFFF used, stored, or disposed of at buildings and crash sites
- Activities or materials used that are likely to contain PFAS
- Studies conducted to assess the environmental impacts of PFAS
- Review of potential off-post sources.

The records review included a combination of Internet-based searches and reviews of aerial photography, historical maps, technical reports, previous studies, and investigations available online. In addition, an EDR report was generated and is included in Appendix F. An EDR report includes search results from a variety of environmental, state, city, and other publicly available databases for up to 2 miles surrounding a referenced property (EDR 2021).

A records review was conducted of available environmental investigations conducted under CERCLA and Resource Conservation and Recovery Act (RCRA) regulatory programs. In addition, internal Army documents that were available in the Administrative Record managed by VAARNG were reviewed, which included inspection reports, installation maps, and site assessments. Table 3-1 lists the documents reviewed that are relevant to the evaluation of AOPIs in this PA. A complete list of sources reviewed is provided in Appendix B.

Information gathered during the records reviews helped identify data gaps and enabled elimination of several areas based on their historical use. Data gaps associated with facility operations; PFAS-containing material use, storage, or disposal; and current exposure receptors at Fort Pickett contributed to a conservative approach for identifying AOPIs. However, areas with little potential to result in a PFAS release, such as residential buildings, hospitals, cafeterias, and recreational areas, were eliminated from further evaluation early in the PA process.

Areas identified to have potentially used, stored, or disposed of, or had recorded the potential for a release of PFAS-containing materials, including AFFF, were further evaluated.

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Table 3-1. Summary of Relevant Records Reviewed

Document Title	Author	Date	Relevance
U.S. Army Base Realignment and Closure 95 Program, Environmental Baseline Survey Report, Fort Pickett, Virginia	Woodward Clyde	February 25, 1997	Background information, information for AOPIs
Archives Search Report, Fort Pickett, Volumes I and II	U.S. Army Corps of Engineers, St. Louis District	April 1997	Background information, previous investigation information, groundwater information
Final Environmental Assessment for BRAC 95 Disposal and Reuse of Fort Pickett, Virginia	U.S. Army Corps of Engineers, Norfolk District	September 1998	Background information, ecological information
Background Groundwater Survey of Excess Property	Weston Solutions	April 2003	Background groundwater information
Final Phase II RI/FS Report Addendum, EBS-79, Fort Pickett, Virginia	EA Engineering, Science and Technology, Inc.	July 2004	Information for AOPIs, previous investigation information
Finding of Suitability of Transfer (FOST) the 31 Acre Parcel (EBS-13) at Fort Pickett, Virginia	U.S. Army, BRAC	May 18, 2005	Information for AOPIs, LUCs
Finding of Suitability of Transfer (FOST) the BCT-22 Parcel at Fort Pickett, Virginia	U.S. Army, BRAC	May 31, 2005	Information for AOPIs, LUCs
Draft Final Remedial Assessment Report for Environmental Sampling at BCT-22, Former Fuel Station, Fort Pickett Virginia	MicroPact Engineering, Inc.	July 2005	Information for AOPIs, previous investigation and monitoring well information
Quitclaim Deed: Former Fort Pickett Military Installation, Nottoway County, Virginia, Parcel No. BCT-22	U.S. Army Corps of Engineers, Norfolk District	October 6, 2005	LUCs
Final Remedial Action Report for the Final Action at EBS-13 Salvage Yard, Fort Pickett, Virginia	Tetra Tech, Inc.	October 7, 2005	Information for AOPIs, previous investigation and monitoring well information, LUCs
Nottoway Water Supply Plan, Final Report	Dewberry & Davis	October 26, 2009	Background information, physical setting, water resource and use
Final Preliminary Assessment Report, Fort Pickett, Virginia: Perfluorooctane-Sulfonic (PFOS) and Perfluorooctanoic Acid (PFOA) Impacted Sites, ARNG Installations, Nationwide	AECOM	May 2020	Background information, physical setting, PFAS investigation of VAARNG property, adjacent sources
Legacy Base Realignment and Closure Installations Conveyance Progress Reports: Fort Pickett, Virginia	U.S. Army	October 1, 2020	Background information, land parcel ownership and conveyance information

Table 3-1. Summary of Relevant Records Reviewed (Continued)

Document Title	Author	Date	Relevance
Army National Guard Maneuver Training Center, Fort Pickett, Joint Land Use Study, Public Draft Background Report	Matrix	March 2021	Background information, physical setting, land parcel ownership and conveyance information
Final Site Inspection Report, Fort Pickett, Blackstone, Virginia: Perfluorooctane-Sulfonic (PFOS) and Perfluorooctanoic Acid (PFOA) Impacted Sites, ARNG Installations, Nationwide	AECOM	May 2022	Background information, PFAS investigation of VAARNG property

3.2 AERIAL PHOTOGRAPHIC ANALYSIS

The PA included review of seven historical aerial photographs provided in the EDR report spanning from 1963 through 2016 (EDR 2021). Seventeen aerial photographs from 1955 to 2018 available from historicaerials.com were also reviewed. The aerial photographs were analyzed to identify potential activities or developments that may suggest the potential use, storage, or disposal of PFAS-containing materials, including AFFF (e.g., evidence of fire training activities, such as fire pits or burn scars); however, no conclusions on PFAS-containing materials, including AFFF, use, storage, or disposal were drawn from the aerial photograph review. The EDR aerial photographs are presented in Appendix C. The aerial photographic analysis is summarized as follows:

- **1955** – The Fort Pickett cantonment area and Airfield appears fully developed. Several buildings and roadways are present in the vicinity of the Blackstone Army Airfield Burn Pits (herein referred to as the Burn Pits) and the area is heavily scarred. The vicinity of the Pickett Park property appears mostly undeveloped with a few secondary roadways and ground scarring throughout. Buildings 460, 484, 493, 755, and 1268 are distinguishable, and what appears to be an open area is present at the site of Former Fuel Station No. 1. The Former Nozzle Testing Area is the site of several buildings. The WWTP is visible and remains relatively unchanged throughout all available aerial photographs.
- **1963** – The Burn Pits and vicinity of Pickett Park are more vegetated. Significant ground scarring is still visible at the Burn Pits and to a lesser extent in the Pickett Park area.
- **1967** – Fewer structures surround the Burn Pits, and the ground scarring is still visible in a somewhat circular shape. The Former Recycle Center exhibits numerous, nearly linear strips of disturbed land located throughout the area. The remaining area on the Former Recycle Center property is undisturbed and appears to be vegetated. The Former Fire Station buildings are still in place, and the Former Fuel Station No. 1 appears to house more equipment.
- **1974** – The Former Recycle Center exhibits heavy ground scarring throughout.
- **1982** – The majority of the original buildings south of the Airfield are no longer present except for those in the 2400-3000 area (i.e., VAARNG property). One building remains in the vicinity of the Nozzle Testing Area.
- **1984** – Building 1268 is no longer present but Building 755 is still in place. The vicinity of Pickett Park has been developed in the areas of W. 10th Street, and ground scarring is significant to the north of the developed area. Numerous linear ground scars exist at the Former Recycle Center property. Buildings 460, 484, and 493, and the Former Fuel Station No. 1 remain unchanged. The original scarring at the Burn Pits remains unvegetated, and the previously mentioned structures surrounding the Burn Pits are no longer present.

- **1994** – A man-made pond exists south of the Former Recycle Center and north of Military Road. The Former Recycle Center appears to be mostly vegetated with unknown circular scarring throughout. The Burn Pits have vegetated, but ground scarring is still evident. The Former Nozzle Testing area is a grassy lot. The Current Fire Station has been constructed.
- **2002-2003 –** A new smaller building appears to be in place of Building 755. The roadway to Building 484 is no longer present. The Nozzle Testing Area exhibits growth of small shrubbery within the grassy lot across from the Current Fire Station. The asphalt between the Fire Station and storage sheds (i.e., back parking lot), as well as part of W. 20th Street, exhibit staining. The Former Recycle Center and Burn Pits are heavily vegetated. A small, scarred area is visible off W. 10th Street on the Former Recycle Center property, and the Burn Pits exhibit a small, circular scarred area. The Pickett Park property has been developed significantly east of the Airfield.
- **2006 –** The Former Recycle Center appears to be a fully vegetated and maintained lot. The Pickett Park property appears to be fully developed.
- **2007-2016 –** No significant changes to most of the BRAC property.
- **2018 –** The FASTC complex has been extensively developed within the BRAC property boundary, including test/racetracks, administrative buildings, and training areas. The structure at the site of Building 755 is no longer present. The buildings that existed west of Kemper Avenue, east of Bakers Row, and north of Military Road have largely been removed, and the area has been repurposed for FASTC use. The Former Recycle Center appears to be the site of secondary roadways. No significant changes are apparent to Buildings 460 and 493, the Former Fuel Station No. 1, and Pickett Park. Undefined vehicles are visible in the driveway of Building 460 throughout the available aerial photographs.

3.3 PA SITE VISIT

Prior to the site visit, the PA site visit team corresponded with VAARNG personnel to coordinate dates and access to the facility and to identify potential interviewees. The site visit was conducted on May 5 and 6, 2022. The site visit included a site walk and visual inspection of all readily accessible areas at the Fort Pickett BRAC property to identify potential sources of PFAS and gather information for developing CSMs at AOPIs. In addition, the PA team visited the Fort Pickett Fire Department, Department of Public Works (DPW), WWTP, and Fort Pickett LRA, and conducted in-person interviews with personnel regarding training activities, historical operations, and BRAC parcel ownership information.

During the site visit, documents in the Building 316 environmental file, which related to facility history, installation assessment, and site maps, were reviewed. In addition, Fort Pickett's map record, which was found in the DPW Building map cabinets and related to the sanitary sewer lines and historical building schematics and placement, was reviewed. Appendix D contains photographs from the PA site visit.

3.4 SUMMARY OF INTERVIEWS

Over the course of the PA research, telephone and in-person interviews were conducted with former and current VAARNG, environmental contractor, Fort Pickett LRA, and Blackstone WWTP personnel with historical knowledge of the operations and environmental investigations. In addition, a PA questionnaire was distributed to Fort Pickett Fire Department, DPW, and Fort Pickett LRA personnel. The primary goal of the questionnaire was to identify whether PFAS-containing materials, including AFFF, were used on post prior to or following property transfer, where they were used, how much was used, how much remains, and whether any releases may have occurred. Responses to the questionnaires were not received. Completed interview forms with notes from telephone and in-person interviews are included in Appendix E. Table 3-2 summarizes the interviews conducted and the pertinent information provided.

Table 3-2. Interviews Conducted for PA

Title	Date	Information Provided
Director – DPW	In-person interview on May 6, 2022 Telephone interview on May 31, 2022	The DPW Director has approximately 47 years of experience at Fort Pickett and has filled numerous roles in his tenure (see Appendix E for details). He provided the following information: • The three historical fire stations in the BRAC property were Buildings 460, 755, and 1268. Buildings 755 and 1268 were decommissioned as fire stations in the 1950s or 1960s. Building 755 was repurposed as a salt/sand shed until demolition (i.e., upon property transfer to FASTC). Building 1268 was likely demolished in the 1970s. • The Current Fire Station (Building 1485) was built in the 1980s. Building 460 was the fire station prior to Building 1485 and used for storage following decommission. A small building was located directly to the west of Building 460 and used for storage by the Fire Department. A drain from Building 460 is connected to the sanitary sewer system. • Fire trucks were likely washed in station driveways. • Building 493 was possibly used by the Fire Department for storage but not exclusively. • When buildings were scheduled for demolition, it was common practice to allow the public to purchase the buildings and haul them off the installation. Those buildings that were not sold were demolished, piled, burned, and buried in place. • The Former Fire Chief, prior to the Current Fire Chief, started working at Fort Pickett immediately preceding selection for closure under BRAC. The Director stated that there are two former Fire Chiefs that would have historical knowledge of the Former Fire Station (Building 460) and common practices.
Former Fire Chiefs (2) – Fort Pickett	Received input via the Director (DPW) email correspondence dated June 15, 2022 (see Appendix E)	The Director (DPW) contacted two Former Fire Chiefs for information regarding historical Fire Department practices related to AFFF when Building 460 was an active fire station. It is unknown when the Former Fire Chiefs worked at Fort Pickett. The Director provided the following information on behalf of the Former Fire Chiefs: • Prior to 1978-1979, a protein/fish product had been used. • AFFF was used for training purposes only. Training occurred at the Burn Pits, and neither recalled using AFFF during an actual emergency event. • AFFF was stored in Buildings 493 and 484. • The other Fire Department facilities that were located in what became the LRA property were either demolished or abandoned prior to the use of AFFF.
Former Environmental Consultant – GECO, LLC	Telephone interview on May 24, 2022	GECO, LLC has more than 20 years of experience in environmental cleanup at Fort Pickett. The former environmental consultant provided the following information: • GECO, LLC cleaned out Building 493 and the Storage Yard prior to conducting EBS-79 environmental investigations. AFFF could not be confirmed to be stored in Building 493 at the time.

Table 3-2. Interviews Conducted for PA (Continued)

Title	Date	Information Provided
Former Environmental Consultant – GECO, LLC	Telephone interview on May 24, 2022	• Building 493 had a dirt floor, and any leaks or spills inside the building would have been in direct contact with the soil. • A flamethrower/FTA was rumored to exist in the Pickett Park property (between the lumber mill and 10th street), but GECO, LLC did not discover any evidence of this during cleanup activities. The area between the lumber mill and 10th street was a main corridor for tanks to travel from the cantonment areas to the training areas. Historically, debris would be set on fire to mimic battle scenarios for training. It is unknown how the fires were extinguished.
General Manager – Fort Pickett LRA	In-person interview on May 5, 2022	The General Manager has approximately 19 years of experience at the Fort Pickett LRA. He provided the following information: • LUCs and groundwater restrictions are unknown, but the groundwater is not used for drinking. • Generally, the area north of the Airfield is zoned agricultural and industrial; the area south of the Airfield is zoned industrial. • BRAC property parcel ownership was confirmed (see Appendix E for details). • MetalSpray was located on what is now FASTC property and operated as a sandblasting and metal refurbishing facility. No metal plating operations were conducted.
Environmental Specialist II – VAARNG	In-person interview on May 5-6, 2022	The VAARNG Environmental Specialist has approximately 2 years of experience at Fort Pickett. He provided the following information: • Former Fuel Station No. 1 is undergoing LTM for site closure. • Building 460 is currently being used to store construction material. • The MetalSpray location was located on the southern side of W. 10th Street along Armstead Avenue. • A decontamination sample was analyzed for PFAS for the VAARNG PFAS PA/SI and is representative of the drinking water (i.e., from the freshwater treatment plant, treated from the Nottoway Reservoir). PFAS results for potable water at Fort Pickett are discussed in Section 4.1.
Current Assistant Fire Chief – Fort Pickett Fire and Emergency Services	In-person interview on May 6, 2022	The current Assistant Fire Chief has approximately 24 years of experience at Fort Pickett. He provided the following information: • AFFF was sprayed toward and into the tree line across W. 20th Street during nozzle testing activities. These practices concluded approximately 15 to 20 years ago, and it was estimated that 120 gallons or less of AFFF solution were used per event. • The Former Fire Stations at Buildings 755 and 1268 were decommissioned in the 1950s or 1960s. • Building 460 was the Former Fire Station. Building 493 functioned as a storage warehouse, and it is unclear if or how the Fire Department used the storage space. • The Burn Pits could have been used for fire training exercises up until the property underwent BRAC closure. • A dumpster fire occurred in 2009 and AFFF was used to extinguish the flames (at most, 70 gallons of Class B AFFF were used in the fire response). The Assistant Fire Chief provided the location of the dumpster fire to be somewhere in the 2400-2600 Area of the VAARNG property.

Table 3-2. Interviews Conducted for PA (Continued)

Title	Date	Information Provided
Blackstone WWTP Operator	In-person interview on May 6, 2022	An operator for the Blackstone WWTP provided the following information: • The WWTP and sanitary sewer piping network was constructed in 1942. The original network is still used today. • The WWTP discharge DEQ permit on record is for sanitary sewer only. • Stormwater is not designed to enter the sanitary sewer system; however, it is suspected to be infiltrating the network due to observations of higher inflow to the plant during heavy rain events. • Open manholes, as well as those at or below grade, are susceptible to receiving constituents applied to the ground in the vicinity of those points of entry. Any product introduced to manholes would be delivered to the WWTP.
Blackstone Water/Sewer Facilities Department Operator	Telephone interview via Blackstone WWTP Operator on May 6, 2022	A Blackstone Water/Sewer Facilities Department employee who inspects the manholes throughout Fort Pickett. He provided the following information: • Manhole 460 is located outside the current Fire Station (Building 1485) and is part of the sanitary sewer system. It could not be confirmed if Manhole 460 is open or closed, or how it is related to drainage at the station.

4. SUMMARY OF PA DATA

4.1 PREVIOUS PFAS INVESTIGATIONS

In 2012, USEPA published the Third Unregulated Contaminant Monitoring Rule (UCMR3), which required nationwide public water systems (i.e., waterworks) to sample for a list of 30 unregulated contaminants, including 6 chemicals of concern relevant to this PA (i.e., PFOS, PFOA, PFBS, PFNA, perfluoroheptanoic acid [PFHpA], and PFHxS). USEPA published the Fifth Unregulated Contaminant Monitoring Rule (UCMR5) in 2021, which expanded the list to 29 PFAS and included more public water systems serving populations less than 10,000 (USEPA 2023). As part of the UCMR5 sampling, subject to the availability of USEPA appropriations, the Blackstone Public Water System, which serves Fort Pickett, may be included for sampling between January 2023 and December 2025 (USEPA 2023). State-wide sampling data under UCMR3 did not reveal significant occurrences of PFOS or PFOA in Virginia (VDH 2021a).

The Virginia Department of Health (VDH) Office of Drinking Water (ODW), in conjunction with the Virginia PFAS Workgroup, designed a sample study to prioritize sites for measuring PFAS concentrations in drinking water and major sources of water and generate statewide occurrence data. Samples were collected from late May through July 2021. Samples from treated water sources nearest to Fort Pickett (located in Chesterfield County [3], city of Richmond [1], Henrico County [2], and Prince Edward County [1]) did not contain PFAS above the practical quantitation limit (VDH 2021b). The sample study was limited to 45 waterworks. As a follow-up to the 2021 PFAS monitoring and occurrence study, an expanded Phase 2 PFAS Sampling Program of approximately 400 entry points at source groundwater and surface water was conducted from July 2022 through September 2023 to collect additional data on the occurrence in public drinking water supplies (VDH 2021a).

In May 2022, ARNG completed a final PFAS SI for the VAARNG property at Fort Pickett (AECOM 2022). The final PA was completed in May 2020 and identified five areas of interest (AOIs) on the VAARNG property as potential PFAS release areas, which were expanded to 11 AOIs during the SI. The SI sampling for the VAARNG property at Fort Pickett was conducted in May and June 2021 and included 110 soil samples from 51 boring locations and 41 groundwater samples. The final PFAS SI identified several potential PFAS sources associated with the VAARNG property

A Fort Pickett potable water source was sampled for PFAS in February 2021 prior to the start of field activities for the VAARNG PFAS SI. The potable water source was analyzed to verify acceptance for use in decontamination of drilling equipment. Concentrations greater than the detection limit were detected for several target analytes, including 6:2 fluorotelomer sulfonate (1.36 ng/L), PFBA (1.90 ng/L), and PFOS (1.00 ng/L). The associated field sample results were greater than five times the concentration detected in the potable water source sample; therefore, it was anticipated that the data would not be impacted, and the potable water source was used for field decontamination (AECOM 2020).

4.2 EVALUATED SITES

During the PA records reviews, interviews, aerial photographic analysis, and site reconnaissance, the PA team investigated available documentation and physical evidence for areas having a potential historical PFAS release. The sites evaluated include fire stations; fire training areas (FTAs); landfills; plating operations; WWTPs; pesticide facilities; vehicle maintenance shops, which used car washes and engine lubricants; paint shops; and photographic processing facilities, as shown in Figure 4-1 and described in the following sections.

4.2.1 AFFF Use, Storage, and Disposal

The PA process included searching for evidence of current or historical AFFF use, storage, and/or disposal at the BRAC property of Fort Pickett. Although AFFF is not currently stored or used on the BRAC property,

historical AFFF storage and use was identified through data collected during the personnel interviews, site visit, and records review. In addition, AFFF storage and use were identified on the adjacent VAARNG property. The areas of the BRAC property that were identified as potential areas of historical AFFF storage and/or use, or potentially impacted by storage and/or use at the adjacent VAARNG property, are discussed below. All areas described below are part of the BRAC property at Fort Pickett.

According to personnel interviews and evaluation of maps provided by the DPW, Fort Pickett historically housed six fire stations, not including the Current Fire Station (Building 1485), since establishment in 1941. Of the six historical locations, three existed within the BRAC property (Buildings 460, 755, and 1268) and three existed on the VAARNG property (Buildings 1818, 2110, and 2860). The historical fire stations on VAARNG property were evaluated in the VAARNG PA/SI (AECOM 2020). The Current Fire Station (Building 1485) is located on VAARNG property adjacent to BRAC property. According to the Assistant Fire Chief, the fire stations at Buildings 755 and 1268 were decommissioned in the 1950s or 1960s and demolished in the 1980s. Building 755 was repurposed as a salt shed upon closure of the station and prior to demolition. Records documenting the historical use of these buildings were unavailable during the PA research.

Building 460 (Former Fire Station) was constructed in 1942 and operationally preceded the Current Fire Station (Building 1485) until closure in 1987. The Former Fire Station is located at the corner of W. 10th Street and Bakers Row, directly north of environmental sites EBS-79 (Building 493 and Storage Yard) and BCT-22 (Former Fuel Station No. 1). Building drawings of the original fire stations obtained during the site visit depict an "Apparatus Room" directly inside three bay doors, where fire trucks would have been stored. AFFF would likely have been stored on fire trucks in preparation for and/or at the end of training exercises. The Director of the DPW indicated fire trucks were likely washed in fire station driveways. The Former Fire Station is currently used to store construction material.

Building 484 (Extinguisher Building) was constructed in 1945 and located next to the Building 460 Former Fire Station, as depicted in historical as-built diagrams and shown in aerial photographs. Former Fire Chiefs confirmed AFFF storage in the Extinguisher Building and recalled historical use of AFFF only during training exercises (i.e., Burn Pits). The roadway to the Extinguisher Building is no longer present at the site; however, the building appears to be present and in disrepair.

Environmental sites EBS-79 and BCT-22 are located on either side of Bakers Row, approximately 160 feet south of the Former Fire Station and Extinguisher Building. Both sites were identified to require environmental restoration during BRAC closure activities via the Environmental Baseline Survey (EBS) and BRAC Cleanup Team (BCT).

Site BCT-22, also known as Former Fuel Station No. 1, was the main fuel distribution system for Fort Pickett in the 1940s and consisted of an underground storage tank and pipeline network and are the suspected cause of contamination. Site BCT-22 is actively undergoing long-term monitoring (LTM), with the most recent sampling conducted in June 2021 (Hana-Bay West 2021), to assess the effectiveness of the implemented 2005 site remedy (i.e., in situ chemical oxidation treatment). Two more years exist under the current LTM contract for BCT-22. No evidence of AFFF use, storage, or disposal or other PFAS sources was found at the Former Fuel Station No. 1 during records review or site reconnaissance.

According to Woodward Clyde (1997), Building 493 was constructed in 1945 and designated as part of the fire department. Building 493 and the adjacent Storage Yard is also known as EBS-79. Site EBS-79 was identified as a BRAC parcel during the EBS and by BCT due to past site use for storage of fuels and proximity to BCT-22 (EA 2004). The Director of the DPW indicated that many departments at Fort Pickett used Building 493 for storage. According to former environmental consultants (i.e., GECO, LLC), materials were removed from Building 493 and the Storage Yard in response to the BRAC closure and cleanup efforts in the mid to late 1990s. Building 493 reportedly had a dirt floor, but inventory specifics were not recalled. However, Former Fire Chiefs confirmed storage of AFFF in Building 493.

According to the VAARNG PA/SI (AECOM 2020), the Burn Pits, located on BRAC property directly north of the Airfield, were used for fire training activities until 1989. Unknown amounts of AFFF were reportedly used during fire training activities several times per year, but it is unknown when the Burn Pits were first used for training exercises. The Burn Pits were identified as environmentally impacted during the EBS (Woodward Clyde 1997); as a result, the site is also known as EBS-103. The Burn Pits are in a primarily wooded area with what appear to be relics of a gravel road circling a partially cleared expanse. Based on the final RI for EBS-103 (Weston 2001), the Burn Pits consisted of an unlined, clay pit, surrounded by a shallow, clay berm with standing water. Flammable liquids were added to the standing water and ignited for training exercises. A constructed ditch connected the pit to a nearby creek, and water from the pit would flow into the ditch during storm events. The pit has been excavated multiple times to address volatile organic compound, polynuclear aromatic hydrocarbon, total petroleum hydrocarbon, and metal contamination. Former Fire Chiefs confirmed use of AFFF at the Burn Pits during training exercises.

4.2.2 Metal Plating Operations

No historical metal plating operations were identified at Fort Pickett within the BRAC property boundary.

According to the VAARNG PA/SI (AECOM 2020), a metal plating facility existed in the Pickett Park complex from 2000 to 2012. During records review and evaluation of the EDR report, a company called MetalSpray North America (MetalSpray) was identified to have existed in Pickett Park. A 2003 spill report provided in the EDR report indicated the property was abandoned at the time of the spill investigation, which was conducted in 2004. Furthermore, the Nottoway County website places MetalSpray in Pickett Park in April 1999, and interviews with the Fort Pickett LRA could not delineate exact dates of operation. Therefore, the facility could only be confirmed to be in operation from 1999 to 2003.

In an interview conducted with the Fort Pickett LRA during the site visit, MetalSpray was located on the southern side of W. 10th Street along Armstead Avenue. This location was confirmed by DPW personnel, and the address was provided in the spill report. Consequently, MetalSpray was confirmed to be located on FASTC property. Details provided in the spill report and information gleaned from interviews indicate that MetalSpray operations primarily consisted of sandblasting and metal refurbishing practices. As a result of the abovementioned lines of evidence, metal plating operations on the BRAC property were not identified.

4.2.3 Wastewater Treatment Plants

The WWTP and corresponding sanitary waste system was constructed in 1942. Blackstone assumed control of the operations of the WWTP on July 1, 1995 (Woodward Clyde 1997) and ownership in 2000 (Matrix 2021). The facility is the subject of Virginia Pollutant Discharge Elimination System (VPDES) Permit number VA0025194, which allows Blackstone to discharge treated wastewater into an unnamed tributary of Hurricane Branch in strict compliance with the terms, limitations, and requirements delineated in the permit. The unnamed tributary of Hurricane Branch flows into the Nottoway River several miles downstream to the south (AECOM 2020).

The WWTP provides primary, secondary, and tertiary treatment that includes grit removal, trickling filters, clarifiers, chlorination, and dechlorination (AECOM 2020). According to the Fort Pickett LRA, the WWTP services Fort Pickett except for the Arbortech Forest Products property in Pickett Park, which operates on septic. The WWTP also provides services to Blackstone and several private residences. Sludge generated at the WWTP was historically disposed of at the Dearing Landfill (located on VAARNG property) and is currently disposed of at the Nottoway County Landfill (AECOM 2020). The Dearing Landfill was investigated in the VAARNG PFAS PA/SI (AOI 9) and was not recommended for further investigation in an RI (AECOM 2022).

According to interviews with WWTP operators, in addition to the sanitary waste streams received from the buildings at Fort Pickett, below-grade and open manholes located throughout the installation could deliver

surface runoff to the WWTP. Therefore, direct ground application of materials near these points of entry could be delivered to the WWTP. In addition, it was noted that the WWTP receives a surge of inflow during heavy rainfall events, which indicates that the sanitary sewer lines may be receiving infiltration from leaks in the system. Present-day PFAS releases were not identified during the research for this PA; therefore, it cannot be determined if the WWTP receives PFAS-related contamination. Furthermore, identifying the source of any contamination would not be conclusive, since the WWTP services Fort Pickett, including the VAARNG and BRAC properties, Blackstone, and private residences outside the installation boundary.

4.2.4 Landfills

Fort Pickett has five identified former landfill sites (all located on VAARNG property): Trimble Road, Dearing Road, Old Hospital Area/Open Dump Area, and Landfills No. 4 and 5 (AECOM 2020). Landfills No. 4 and 5 are adjacently located, and based on information provided in the EBS (Woodward Clyde 1997), have been interpreted to make up the Mosby Road Landfill located directly west of the WWTP. All landfill sites are located on the VAARNG property and are discussed in the VAARNG 2020 PA/SI (AECOM 2020).

The Former Recycling Center (i.e., EBS-13) is the only known salvage yard within the BRAC property. The Former Recycling Center is bounded to the north by the Airfield, to the east by EBS-79 and adjacent woods, and to the west by Garnett Avenue. The site is owned by FASTC and used as a test track for training purposes.

The Former Recycling Center was reportedly a burial ground for metal and other demolition debris and may have received paints, solvents, and petroleum products in the late 1960s and early 1970s, but no later than 1975 (Woodward Clyde 1997). According to the VAARNG PA/SI, the Former Recycling Center was used as a storage yard for vehicles, metal containers, crates, and debris piles between the 1940s and 1960s. A flare drop in approximately 1977 caused a fire at the Former Recycling Center. The Fort Pickett Forestry Service responded to the wildland fire, but AFFF was not used (AECOM 2020).

Removal actions were conducted at the Former Recycle Center in 1999 and 2003 in conjunction with a three-phase RI/Feasibility Study (FS), followed by a groundwater remedial action, which was completed in 2005. A Five-Year Review was conducted due to residual contamination remaining at the site. The first Five-Year Review concluded that subsequent Five-Year Reviews were not necessary because contamination had not been detected following employment of the groundwater remedy (Tetra Tech 2010).

No evidence of, use, storage, and/or disposal of PFAS-containing materials, including AFFF, was found at the Former Recycling Center.

4.2.5 Other Potential Sources of PFAS

In addition to AFFF, other potential sources of PFAS may be associated with the use of some types of pesticides, car washes, engine lubricants, laundry or water proofing facilities, and photographic processing facilities. Although storage and use of pesticides were identified during PA research, the use of fluorinated pesticides was low until about the mid-2000s (Alexandrino et al. 2022). Given the operational period of Fort Pickett, the likelihood of PFAS impacts due to pesticide use, storage, and/or disposal is assumed to be low. Document research, a site visit, and interviews resulted in identification of potential PFAS sources at Fort Pickett BRAC property at the following locations:

- **Vehicle Maintenance Areas** – Vehicle maintenance activities were conducted at the Unit Motor Pool (Building 1073), Body Shop/Paint Booth (Building 1083), and Auto Skill Center (Building 1082). Maintenance activities required the use and storage of oil, antifreeze, waste products (e.g., oil and antifreeze), paint, solvent, dextrin, denatured alcohol, enamel, inhibitors, lacquer, lubricating oil, paint thinner, preservatives, and other vehicle fluids (e.g., brake and hydraulic fluid). These vehicle maintenance buildings were constructed in 1952, and it is unknown when operation ceased (Woodward Clyde 1997).

- **Wash Racks** – Wash racks were numerous and widespread across Fort Pickett when operational. At Fort Pickett, wash racks were associated with buildings; therefore, historical building operations were used to determine wash rack considerations as potential source areas. The Unit Motor Pool (Building 1073) was the only building of the evaluated sites, that had numerous wash racks (Woodward Clyde 1997). Although a complete list of products used for wash rack operations at Fort Pickett is not available, common products used in related building operations were available and reviewed for potential PFAS impacts and determined unlikely. Significant PFAS impacts would have resulted from emergency vehicles being serviced at the wash rack. However, interviewee accounts indicated fire trucks were likely washed in fire station driveways.
- **Photographic Laboratory –** Photographic processing and development occurred at Building 1098 until 1996. Building 1098 was constructed in 1942 and stored batteries, silver, and other photographic developing chemicals and protective coatings. Photographic process waste was sent to Fort Lee for disposal (Woodward Clyde 1997). A complete list of photographic processing chemicals used, stored, and/or disposed of at Fort Pickett is not available. However, the use of PFAS-containing chemicals did not become prevalent in the photography industry until about the mid-1990s (Kodak 2002). Given the operational period of Fort Pickett, the likelihood of PFAS impacts due to the use, storage, or disposal of photographic processing chemicals is assumed to be low.

During the document research and site visit, no additional potential PFAS-containing material use, storage, or disposal were identified.

4.3 POTENTIAL OFF-POST AND POST TRANSFER PFAS SOURCES

An exhaustive search to identify all potential off-post PFAS sources (i.e., not related to operations at Fort Pickett) is not part of the PFAS PA program. However, a search of significant potential contributors (i.e., airports, landfills, WWTPs) was performed. Potential off-post PFAS sources within a 5-mile radius of the Fort Pickett installation boundary are shown in Figure 4-2.

The BRAC property is surrounded by former Fort Pickett Army property that is now operated by VAARNG. Therefore, areas outside the BRAC property but within the operational Fort Pickett installation boundary (i.e., VAARNG property) are potential PFAS sources to the property of focus for this PA. The VAARNG PA/SI identified 11 AOIs potentially impacted by PFAS during their investigation (see Figure 5-1a).

Potential PFAS sources within a 5-mile radius of the operational Fort Pickett installation boundary include one fire department (Blackstone Volunteer Fire Department) between 1 and 2 miles, one FTA (Southside Regional Fire Training Grounds; AECOM 2020) within 1 mile, and one solid waste facility (Nottoway County Landfill) between 3 and 4 miles. The only identified airport within a 5-mile radius of the BRAC property is the Allen C. Perkinson Airport/Blackstone Army Airfield within the operational Fort Pickett installation boundary. It is unknown if any of the potential sources outside the Fort Pickett installation boundary use, store, or dispose of PFAS-containing materials, including AFFF.

In addition, potential post-transfer PFAS sources were evaluated for this PA to support an understanding of the CSM. Knowledge of post-transfer operations within the BRAC and VAARNG properties was provided by the Fort Pickett Fire Department, who have operational knowledge, informed the current site use, and evaluated the potential for PFAS use, storage, and/or disposal. As described in Section 3.4, Fort Pickett includes two areas where operations after BRAC transfer include potential and/or confirmed PFAS use, storage, and/or disposal. The potential post-transfer PFAS use, storage, and/or disposal areas are included in Figure 5-1a, including a potential PFAS source that is present on the BRAC property but occurred after Army operations concluded.

Information provided by the VAARNG PFAS PA/SI indicated AFFF releases occurred during fire training exercises outside and to the west of the Current Fire Station (AOI 1 Building 1485). Between 1996 and

2015, approximately 5 to 10 gallons of AFFF were used during biannual training events (AECOM 2020). However, new information obtained during this PA through interviews with the current Assistant Fire Chief, indicates nozzle testing activities included spraying AFFF into the tree line adjacent to Building 1485 and across W. 20th Street, during which approximately 120 gallons of AFFF solution were used at a time (see Figure 5-1a). It is unknown when the nozzle testing activities began, but these activities reportedly ceased sometime between 2002 and 2007. This tree lined area is owned by FASTC and is part of the BRAC property. The nozzle testing area could be an additional source of PFAS release that occurred post transfer on BRAC property directly adjacent to VAARNG property.

In addition, during the records review, information concerning a 2009 dumpster fire was discovered. According to an interview with the Assistant Fire Chief, the dumpster fire occurred in the 2400-2600 Area of Fort Pickett, located on VAARNG property. The Assistant Fire Chief confirmed use of Class B AFFF to extinguish the flames.

5. SUMMARY OF PA RESULTS

The areas evaluated for potential PFAS-containing material use, storage, and/or disposal, including AFFF, at the BRAC property at Fort Pickett were further refined during the PA process and categorized either as an AOPI or were not retained as AOPIs. Of these areas, 10 were not retained as an AOPI and 3 have been identified as AOPIs.

5.1 AREAS NOT RETAINED AS AOPIs

Based on analysis of information obtained during document research, personnel interviews, and/or site reconnaissance, the areas described below were not retained as AOPIs. These areas were previously identified as potential PFAS sources (e.g., AFFF storage, car washes, automobile maintenance, photographic processing, pesticide use or storage, WWTPs, landfills) at the BRAC property. However, site research conducted for this PA does not indicate that PFAS-containing material was used, stored, and/or disposed of at these areas. A brief site history and the rationale for eliminating the areas as AOPIs are presented in Table 5-1.

Table 5-1. Summary of Areas Not Retained as AOPIs on the BRAC Property at Fort Pickett

Area Description	Dates of Operation	Relevant Site History	Rationale
Former Metals Plating Facility (MetalSpray – Pickett Park)	circa 1999 to 2003	Reported metals plating facility at Pickett Park (AECOM 2020). Facility conducted sandblasting and refurbishing of metals. There are no remnants of this former business, and the property is now under FASTC ownership.	The facility was reportedly used for sandblasting and metal refurbishing enterprises and no evidence was found for metal plating operations occurring at the facility. No evidence of use, storage, and/or disposal of PFAS-containing materials. Dates of use was after BRAC transfer.
Former Recycle Center (EBS-13)	Used for storage between the 1940s and 1960s. Used as a burial site from the 1960s through the early 1970s.	Historically used as a burial site for metal scrap and demolition debris with possible dumping of paints, solvents, and petroleum products (Woodward Clyde 1997). Approximately 21 acres of the site have LUCs including groundwater, residential reuse, and excavation or soil disturbance restrictions. This property is owned by FASTC and used as a vehicle test track for training exercises.	No evidence of use, storage, and/or disposal of PFAS-containing materials. Dates of operation likely precede potential use of PFAS-containing materials.

Table 5-1. Summary of Areas Not Retained as AOPIs on the BRAC Property at Fort Pickett (Continued)

Area Description	Dates of Operation	Relevant Site History	Rationale
Former Fuel Station No. 1 (BCT-22)	1940s to 1995	Historically acted as the main fueling station for Fort Pickett and consisted of a series of aboveground and underground storage tanks with pipelines servicing eight other fuels stations around the installation (MicroPact 2005). The entire site (approximately 1.5 acres) has LUCs for groundwater use and land disturbance restrictions. This site is undergoing LTM for site closure. Presently, aboveground storage tanks are stored at the site among a network of monitoring wells.	No evidence of use, storage, and/or disposal of PFAS-containing materials. No structure in place; therefore, the presence of a fire suppression system is unlikely.
Building 1073 (Unit Motor Pool)	1952 to Unknown	Historically part of the 1000 Motor Vehicle Area. Building 1073 operated as a Unit Motor Pool and was associated with numerous storage buildings and wash racks. The chemicals stored and used include, but are not limited to, petroleum products, paint, solvents, and vehicle repair/maintenance fluids (Woodward Clyde 1997). There are no remnants of this building, and the area is now under FASTC ownership, used as a high-speed vehicle test track for training.	No evidence of use, storage, and/or disposal of PFAS-containing materials. Exact dates of operation and implementation of the facility is unknown. SDSs were unavailable for review at the time of the PA.*
Buildings 1082 and 1083 (Auto Center/Paint Booth)	1952 to Unknown	Located next to one another, Building 1082 was historically used as an Auto Skill Center and Building 1083 as an Auto Body Shop/Paint Booth. The chemicals stored include paint, petroleum products, and vehicle repair/maintenance fluids (Woodward Clyde 1997). There are no remnants of this building, and the area is now under FASTC ownership, used as a high-speed vehicle test track for training.	No evidence of use, storage, and/or disposal of PFAS-containing materials. Exact dates of operation and implementation of the facility is unknown. SDSs were unavailable for review at the time of the PA.

Table 5-1. Summary of Areas Not Retained as AOPIs on the BRAC Property at Fort Pickett (Continued)

Area Description	Dates of Operation	Relevant Site History	Rationale
Building 1098 (Photographic Laboratory)	1942 to 1996	The Photography Branch photographic laboratory at Building 1098 was used from 1942 until closure in 1996. Batteries, silver, and other photographic development and protective coating chemicals were stored at the laboratory. Photographic chemical waste was sent to Fort Lee for disposal prior to closure (Woodward Clyde 1997). There are no remnants of this building, and the area is now under FASTC ownership, used as a high-speed vehicle test track for training.	No evidence of use, storage, and/or disposal of PFAS-containing materials. Chemical waste was reportedly shipped off post for disposal. SDSs were unavailable for review at the time of the PA.*
Former Fire Station (Building 755)	Decommissioned in the 1950s or 1960s	Historically functioned as a fire station. Upon decommission, this area was repurposed as a sand/salt shed. There are no remnants of this building, and the area is now under FASTC ownership, used as a training facility.	Dates of facility use pre-date AFFF application in fire protection, response, and/or training; therefore, it is unlikely PFAS-containing materials were used, stored, and/or or disposed of.
Former Fire Station (Building 1268)	Decommissioned in the 1950s or 1960s	Historically functioned as a fire station. This building has been demolished and the area is now owned by FASTC.	Dates of facility use pre-date AFFF application in fire protection, response, and/or training; therefore, it is unlikely PFAS-containing materials were used, stored, and/or disposed of.
WWTP	1942 to Present	The sanitary sewer system spanning Fort Pickett and the town of Blackstone delivers sanitary waste to the Blackstone WWTP. Stormwater is not designed to enter the system; however, influx to the plant exponentially increases with heavy rain events. Manholes in the vicinity of fire training activities where AFFF was used, connect to the sanitary sewer system.	No evidence of PFAS use, storage and/or disposal at the BRAC property to be delivered via waste to the WWTP. Differentiation between Fort Pickett and Blackstone source waste streams is impracticable.

*Additional rationale discussed in Section 4.2.5.

5.2 AOPIs

Based on analysis of information obtained during document research, personnel interviews, and/or site reconnaissance, three areas were categorized as AOPIs resulting from Army activities and are presented in Table 5-2 and Figure 5-1b. Site research conducted for this PA indicates that PFAS-containing material use, storage, or disposal is suspected at these areas.

Table 5-2. Summary of AOPIs at the Fort Pickett BRAC Property

Area Description	Dates of Operation	Relevant Site History	Rationale
Former Fire Station and Extinguisher Building (Buildings 460 and 484)	1942 to 1987	Building 460 operated as a Fire Station until approximately 1987 and the adjacent Extinguisher Building (484) was used for storage. AFFF was stored in Building 484 and used in training exercises.	Fire Station and storage area with reported AFFF storage.
Material and Chemical Storage (Building 493 and Storage Yard)	1945 to circa 1987	Building 493 and the adjacent Storage Yard operated as a storage facility. The fire department stored AFFF in Building 493.	Storage facility with reported AFFF storage.
Blackstone Army Airfield Burn Pits (EBS-103)	Unknown to 1989	The Burn Pits were used for fire training activities. Flammable liquids were poured onto stagnant water in an unlined clay-bottom pit and ignited. Water and AFFF were used to extinguish the fires.	Fire training activities with reported use of AFFF.

A summary of the preliminary CSM framework is presented in Section 5.2.1. AOPI overviews and CSM summaries for each AOPI are presented in Sections 5.2.2 through 5.2.4.

5.2.1 Preliminary CSM

A preliminary CSM was prepared for each AOPI at the Fort Pickett BRAC property in accordance with the USACE Engineer Manual on Conceptual Site Models, EM 200-1-12 (USACE 2012) and USEPA guidance. The preliminary CSMs identified potential human receptors and chemical exposure pathways based on current and/or reasonably anticipated future land uses. The preliminary CSMs identified soil, groundwater, surface water, and sediment pathways as potentially complete.

Based on the documented or potential historical use, storage, or disposal of PFAS-containing materials at the AOPIs, affected media are likely to consist of soil, groundwater, surface water, and sediment. Release and transport mechanisms include dissolution/desorption from soil to groundwater, runoff/dissolution/adsorption with surface water or stormwater, and recharge to groundwater from surface water. While other potential exposure media (i.e., soil and sediment) besides drinking water sources (i.e., groundwater and/or surface water) may be impacted by PFAS, direct ingestion via drinking water is the most likely exposure route, and thus the Army's primary concern for human exposure. Therefore, the focus of the Army's PA program is on potential human exposures via drinking water ingestion. The potential for human exposures to PFAS through non-drinking water pathways has not yet been established and may be evaluated in the future if it is determined that those pathways warrant further consideration. The CSMs presented in this report focus on drinking water pathways via groundwater and surface water that are known to be used as a source of potable water.

Fort Pickett and the town of Blackstone obtain drinking water via the Nottoway Reservoir, as described in Section 2.8. A groundwater exposure pathway is considered potentially complete where constituents of interest (COIs) could migrate from the AOPI source area to groundwater that is used for drinking water. Otherwise, the groundwater exposure pathway is considered incomplete. The following parameters are used to determine if an AOPI source area had a potentially complete groundwater exposure pathway:

- AOPIs located upgradient or in the vicinity of drinking water sources and that have the potential to influence groundwater associated with these potable sources are considered to have a potentially complete groundwater exposure pathway for on-post drinking water receptors.
- AOPIs that have the potential to influence groundwater that flows off post are considered to have a potentially complete exposure pathway for off-post receptors.

The soil exposure pathway is considered potentially complete where COIs could be present in soil. A surface water exposure pathway is considered potentially complete where COIs could be present in a

surface water body (e.g., a reservoir or large river) that serves as a potable water source. The Nottoway Reservoir, located within the operational Fort Pickett installation boundary, is a surface water feature used as a drinking water source. The reservoir is located cross-gradient to most of Fort Pickett; therefore, the Nottoway Reservoir is not likely to be a potential exposure medium for off-post receptors where Fort Pickett is the source. Surface water and groundwater discharges from Fort Pickett via the Nottoway River, which is a known drinking water source downgradient from the installation. Therefore, surface water is a potential exposure medium for off-post receptors. Figure 5-1b presents the locations of the AOPIs. AOPI-specific CSM summaries are provided in Tables 5-3 through 5-5.

5.2.2 Former Fire Station and Extinguisher Building (Buildings 460 and 484) – AOPI Rationale and CSM

The Former Fire Station and Extinguisher Building (Buildings 460 and 484) were identified as an AOPI following records review, interviews, aerial photograph review, and site reconnaissance due to reported AFFF storage.

Building 460 was constructed in 1942 and operated as a fire station until approximately 1987. Fire trucks potentially storing AFFF were stored inside the building and reportedly washed in the driveway. The building has been used for storage since closure of the fire station and is currently used for storage of construction material.

Building 484 was constructed in 1942 and operated as storage for extinguisher chemicals for the fire department until the mid- to late-1980s. According to personnel interviews, AFFF was stored in the building for use during fire training exercises. Based on aerial photographs, the roadway to Building 484 was taken out of service and reverted to a grassy surface in the late 1990s or early 2000s.

A visual inspection of the outside of the Former Fire Station and historical location of the Extinguisher Building was conducted during the site visit. Buildings 460 and 484 are still standing. Sanitary sewer drawings were evaluated, and a single floor drain from Building 460 was confirmed to discharge to the sanitary sewer system. The exterior ground surface at Buildings 460 and 484 is primarily grass with a concrete driveway and a few concrete pads surrounding the Former Fire Station. The property is lined to the north and east, parallel to W. 10th Street and Baker's Row, respectively, by a storm drainage ditch that directs water south toward Building 493 and the Former Fuel Station.

Table 5-3. AOPI CSM Information Profile – Former Fire Station and Extinguisher Building (Buildings 460 and 484)

Profile Type	Information Needs	Preliminary Assessment Findings
Site Profile	AOPI site structures/description	Building 460 is a T-shaped building. Building 484 is a small rectangular building (Woodward Clyde 1997) with a gravel roadway and a circular roundabout just past the location of the building. The buildings were constructed during the WWII era and made of wood. Sanitary waste from Building 460 led to the WWTP. Stormwater runoff collected in drainage ditch to the north and east, flowing south.
	Latitude, longitude	37.0642, -77.9686
	Size	0.40 acres
Land Use	Current/future land use	Industrial
CSM Profile	Source media	Soil
	Migration routes/release mechanisms	The primary exposure mechanism is the potential release of AFFF to surface soils related to historical operations at the Former Fire Station and Extinguisher Building. Constituents could migrate from soil to groundwater via desorption and dissolution. Constituents could migrate to surface water due to runoff and dissolution from stormwater. Interaction and potential connectivity between surface water and groundwater (i.e., discharge and recharge) promote another potential migration pathway of constituents.

Table 5-3. AOPI CSM Information Profile – Former Fire Station and Extinguisher Building (Buildings 460 and 484) (Continued)

Profile Type	Information Needs	Preliminary Assessment Findings
	Exposure pathways, media, and human receptors	Soil is considered a complete exposure pathway. Although groundwater is not currently used for drinking water at Fort Pickett, a potential exposure pathway exists because groundwater is not restricted at this AOPI. In addition, regional groundwater flows to the southeast and has the potential to influence drinking water sources downgradient from the installation boundary. Therefore, a complete groundwater exposure pathway potentially exists for off-post human receptors.

5.2.3 Material and Chemical Storage (Building 493 and Storage Yard) – AOPI Rationale and CSM

Building 493 and the adjacent Storage Yard were identified as an AOPI following records review, interviews, aerial photograph review, and site reconnaissance due to reported AFFF storage.

Building 493 and the adjacent fenced-in Storage Yard were constructed in 1945 and operated as a storage facility for the Fort Pickett fire department until approximately 1987. Other departments at Fort Pickett also used the storage compound from the time of inception. According to Former Fire Chiefs, AFFF was stored in Building 493. The building reportedly had a dirt floor; therefore, leaks or spills from stored materials and chemicals would be in direct contact with soil. Building 493 and the Storage Yard are still being used as a storage facility.

A visual inspection of the outside of the storage compound was conducted during the site visit. Building 493 and the fenced-in Storage Yard are still intact. Installation drawings from the DPW confirmed that the building is not connected to the sanitary sewer system. The exterior ground surface at Building 493 is primarily grass and vegetation with a small concrete driveway off Baker's Row (asphalt road). A storm drainage ditch runs directly in front of the storage compound, parallel to Baker's Row, and discharges to a ditch that lines the southern property boundary.

Table 5-4. AOPI CSM Information Profile – Material and Chemical Storage (Building 493 and Storage Yard)

Profile Type	Information Needs	Preliminary Assessment Findings
Site Profile	AOPI site structures/description	Building 493 is a rectangular building with a dirt floor. The Storage Yard is a fenced-in polygon along the eastern and southern sides of Building 493. Stormwater runoff is collected in a drainage ditch along Baker's Row (western side of compound) and along the southern property boundary.
	Latitude, longitude	37.0635, -77.9679
	Size	0.60 acres
Land Use	Current/future land use	Industrial/Commercial
CSM Profile	Source media	Soil
	Migration routes/release mechanisms	The primary exposure mechanism is the potential release of AFFF to surface soils related to historical operations at Building 493 and the Storage Yard. Constituents could migrate from soil to groundwater via desorption and dissolution. Constituents could migrate to surface water due to runoff and dissolution from stormwater. Interaction and potential connectivity between surface water and groundwater (i.e., discharge and recharge) promote another potential migration pathway of constituents.

Table 5-4. AOPI CSM Information Profile – Material and Chemical Storage (Building 493 and Storage Yard) (Continued)

Profile Type	Information Needs	Preliminary Assessment Findings
	Exposure pathways, media, and human receptors	Soil is considered a complete exposure pathway. Although groundwater is not currently used for drinking water at Fort Pickett, a potential exposure pathway exists because groundwater use is not restricted at this AOPI. In addition, regional groundwater flows to the southeast and has the potential to influence drinking water sources downgradient from the installation boundary. Therefore, a complete groundwater exposure pathway potentially exists for off-post human receptors.

5.2.4 Blackstone Army Airfield Burn Pits (EBS-103) – AOPI Rationale and CSM

The Burn Pits were identified as an AOPI following records review, interviews, aerial photograph review, and site reconnaissance due to reported AFFF use.

The Burn Pits were used for fire training activities until approximately 1989. Flammable liquids were reportedly poured onto stagnant water in an unlined, clay-bottom pit and ignited. The pit was surrounded by a shallow, oil-stained clay berm (Weston Solutions 2002). According to personnel interviews, AFFF and water were used to extinguish the fire. Currently, the location of the Burn Pits is undeveloped and largely an undisturbed, old growth, southern mixed forest (Weston Solutions 2002).

A visual inspection of the Burn Pits was conducted during the site visit. A partial clearing in the wooded area was observed. Historically, a manmade ditch channeled overflow during storm events from the Burn Pits to a small, intermittent creek (Weston Solutions 2002); however, no evidence of the manmade ditch or the Burn Pits was found during the site visit. An unknown number of excavations of the area have occurred since the early 1990s (Weston 2001). During the site visit, several concrete structures were observed. The purpose of these structures could not be determined during research for this PA.

Table 5-5. AOPI CSM Information Profile – Blackstone Army Airfield Burn Pits (EBS-103)

Profile Type	Information Needs	Preliminary Assessment Findings
Site Profile	AOPI site structures/description	Largely undeveloped, undisturbed, old growth, southern mixed forest. Partial clearance in the wooded area where suspected fire training activities and excavations have been conducted.
	Latitude, longitude	37.0839, -77.9519
	Size	1.62 acres
Land Use	Current/future land use	Commercial/Industrial
CSM Profile	Source media	Soil
	Migration routes/release mechanisms	The primary exposure mechanism is the potential release of AFFF to surface soils related to historical operations at the Burn Pits. Constituents could migrate from soil to groundwater via desorption and dissolution. Constituents could migrate to surface water due to runoff and dissolution from stormwater. Interaction and potential connectivity between surface water and groundwater (i.e., discharge and recharge) promote another potential migration pathway of constituents.
	Exposure pathways, media, and human receptors	Soil is considered a complete exposure pathway. Although groundwater is not currently used for drinking water at Fort Pickett, a potential exposure pathway exists because groundwater use is not restricted at this AOPI. In addition, regional groundwater flows to the southeast and has the potential to influence drinking water sources downgradient from the installation boundary. Therefore, a complete groundwater exposure pathway potentially exists for off-post human receptors.

5.3 DATA LIMITATIONS

The data limitations relevant to the development of this PA for PFAS at the Fort Pickett BRAC property are discussed below.

A comprehensive well survey was not completed as part of this PA; therefore, the information reviewed regarding off-post wells is limited to the desktop survey that was completed. The EDR well search report (Appendix F) and the online Virginia Energy database (https://www.energy.virginia.gov/) were referenced when identifying potential off-post drinking water receptors (Virginia Energy 2022).

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

Records reviewed during the PA process were limited in information regarding PFAS-containing materials, including use; procurement records and documentation of AFFF used during emergency responses or firefighter training activities were not available. Anecdotal accounts of AFFF use (and thus likely PFAS release) were limited to available former Fort Pickett personnel, whose knowledge of AFFF use may have been restricted by their time spent at Fort Pickett or previous roles held that limited their relevant knowledge of potential AFFF (or other PFAS) use. In absence of AFFF documentation, the PA was conducted through observation of operational periods, site usage, aerial photographs, records review, anecdotal evidence, and personnel interviews to evaluate the use, storage, or disposal of PFAS-containing materials, including AFFF.

Finally, the records review was limited to available Administrative Record, online resources, waste and chemical inventories, historical drawings, blueprints, and as-built drawings. Therefore, some conclusions and recommendations presented in this report are based on available information, professional judgment, and industry best practices. Multiple sites were eliminated based on the lack of evidence of PFAS-containing chemical use, AFFF use, storage, and disposal, and dates of operation. The possibility exists that PFAS-containing materials were used at a variety of sites (e.g., photographic processing laboratory, maintenance shops) and/or AFFF was stored at chemical storage facilities, which were not identified as AOPIs based on lack of evidence and historical information.

6. CONCLUSIONS

This PA was conducted in accordance with DoD, Army and USEPA guidance documents. Programmatically, the Army has focused its PFAS PA efforts to identify locations where a potential for a release of PFAS exists (i.e., those locations where there was use, storage, or disposal of PFAS-containing materials). Locations on Army installations with the greatest likelihood of releases of PFAS were evaluated as part of this PA, including FTAs, AFFF storage locations, aircraft crash sites, fuel farms, and sites associated with aviation assets. However, other potential sources of PFAS at the Installation were considered and have been documented in this PA. A combination of document review, Internet searches, interviews with Installation personnel, and an installation site visit were used to identify specific areas of suspected PFAS use, storage, and disposal at the BRAC property of Fort Pickett.

The BRAC property of Fort Pickett was assessed, and 16 preliminary areas were identified and evaluated for potential use, storage, and/or disposal of PFAS-containing materials. The preliminary areas were further refined during the PA process and then either identified as an area not retained for further investigation or as an AOPI. In accordance with the established process for the PA, three of the preliminary areas have been identified as AOPIs.

The AOPIs identified during this PA at the Fort Pickett BRAC property are listed below:

- Former Fire Station and Extinguisher Building (Buildings 460 and 484)
- Material and Chemical Storage (Building 493 and Storage Yard)
- Blackstone Army Airfield Burn Pits.

A site-specific CSM was developed for each AOPI based on an assessment of existing records, personnel interviews, and site reconnaissance trips. The CSMs developed for this PA did not identify any of the three AOPIs as presently impacting on-post drinking water receptors. However, a potential future pathway exists at all three AOPIs because groundwater use is not restricted at these AOPIs. In addition, the exposure pathway for off-post drinking water receptors is potentially complete for the three AOPIs.

Given the findings of this PA, the AOPIs presented warrant further evaluation in an SI (40 CFR §300.420(c)).

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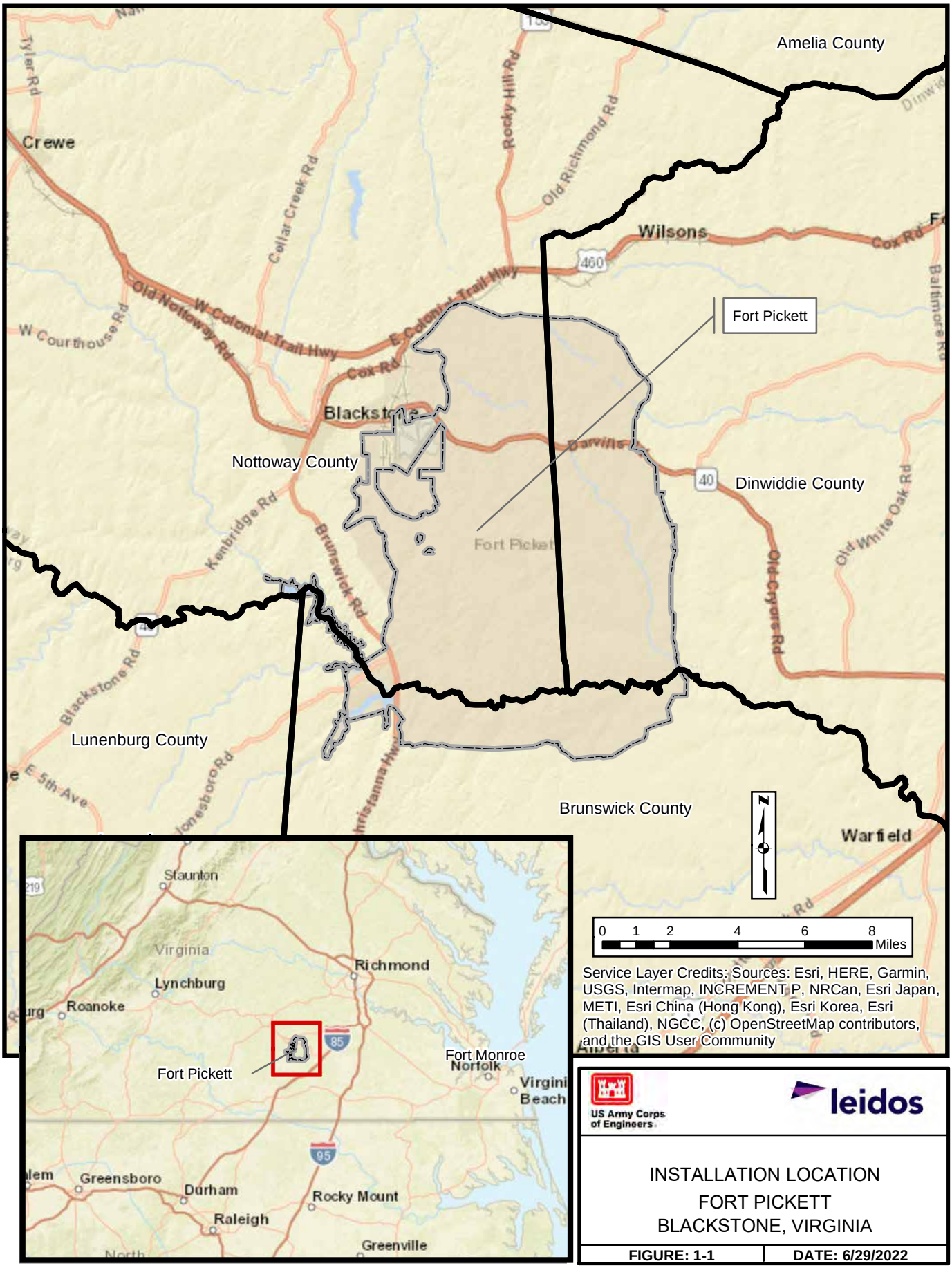
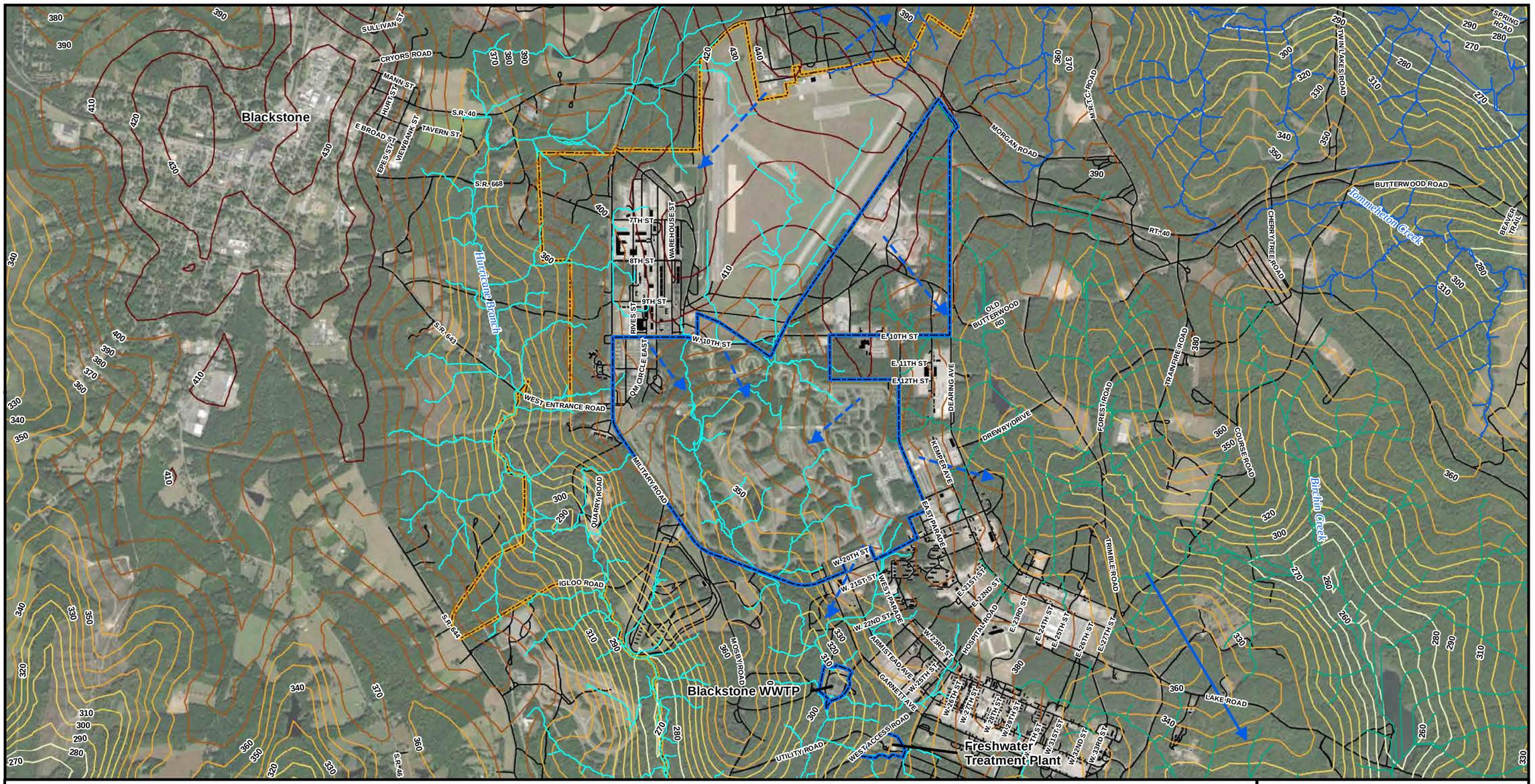
FIGURES



Document Path: C:\cad\21011\MXD\PA\Figure 1-1 FtP Installation Location.mxd



Legend

- Installation/VAARNG Property Boundary
- BRAC Boundary
- Buildings
- Roads
- Birchin Creek/Tributaries
- Hurricane Branch/Tributaries
- Tommeheton Creek/Tributaries
- Localized Groundwater Flow
- Regional Groundwater Flow
- Freshwater wetland
- Freshwater Pond; Lake

Contour

- 260 - 280
- 281 - 320
- 321 - 360
- 361 - 400
- 401 - 440

Notes:
Source: Esri, Maxar, Earthstar Geographics, and the GIS User CommunityAerial image from 2019.
National Wetland Service:
www.fws.gov/wetlandsmapservice/rest/services/Wetlands/MapServer

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SCALE: 1" = 2,500'

VA STATE PLANE SOUTH (NAD83)

US Army Corps of Engineers.

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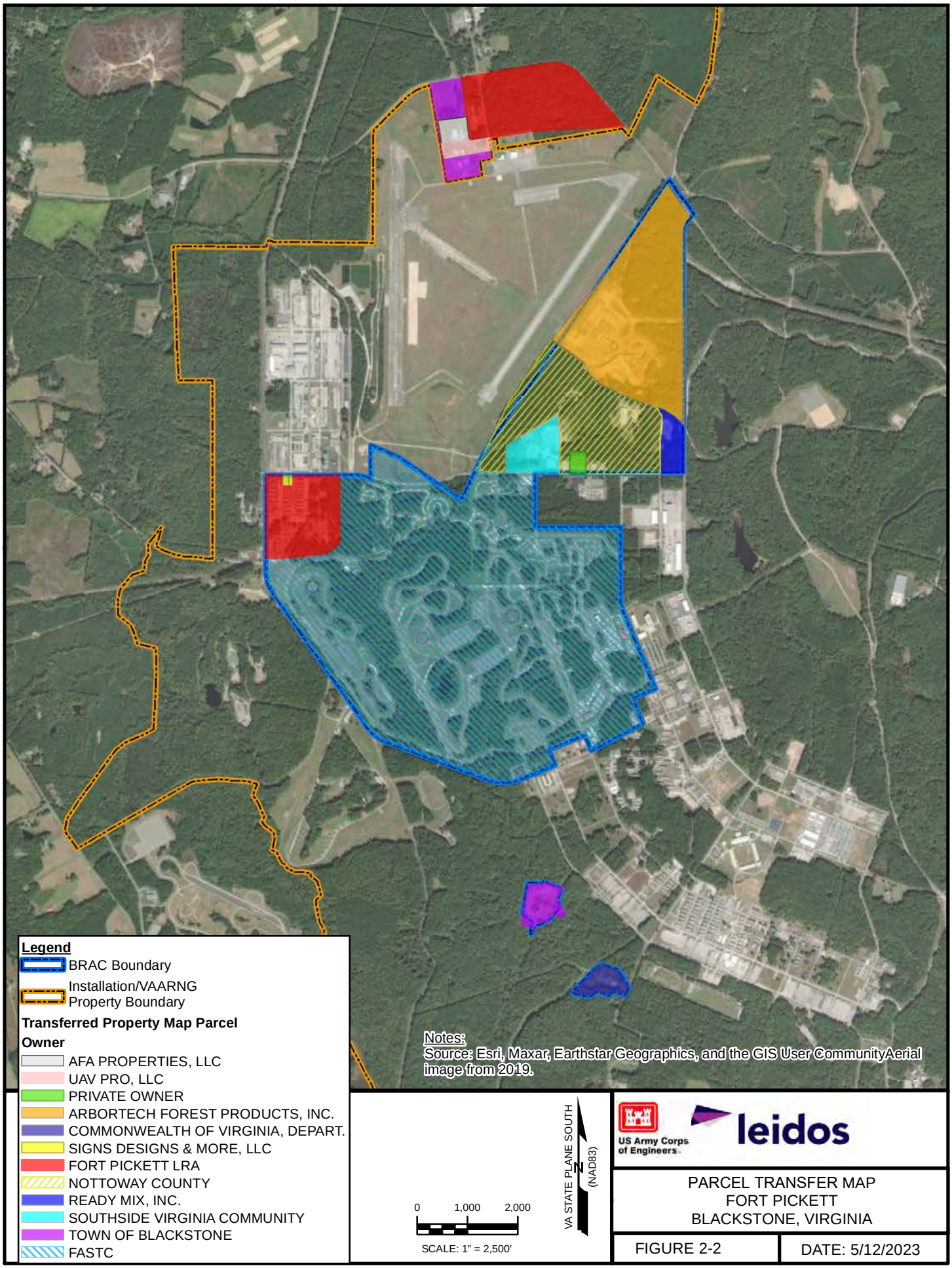
SITE FEATURES
FORT PICKETT
BLACKSTONE, VIRGINIA

FIGURE 2-1 | DATE: 4/3/2023

C:\cad\21011\MXD\PA\Figure 2-1 Site Fort Pickett Site Features.mxd


Legend
BRAC Boundary
Installation/VAARNG Property Boundary
Transferred Property Map Parcel Owner
AFA PROPERTIES, LLC
UAV PRO, LLC
PRIVATE OWNER
ARBORTECH FOREST PRODUCTS, INC.
COMMONWEALTH OF VIRGINIA, DEPART.
SIGNS DESIGNS & MORE, LLC
FORT PICKETT LRA
NOTTOWAY COUNTY
READY MIX, INC.
SOUTHSIDE VIRGINIA COMMUNITY
TOWN OF BLACKSTONE
FASTC
Notes:
Source: Esri, Maxar, Earthstar Geographics, and the GIS User CommunityAerial image from 2019.
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SCALE: 1" = 2,500'
VA STATE PLANE SOUTH
N
(NAD83)
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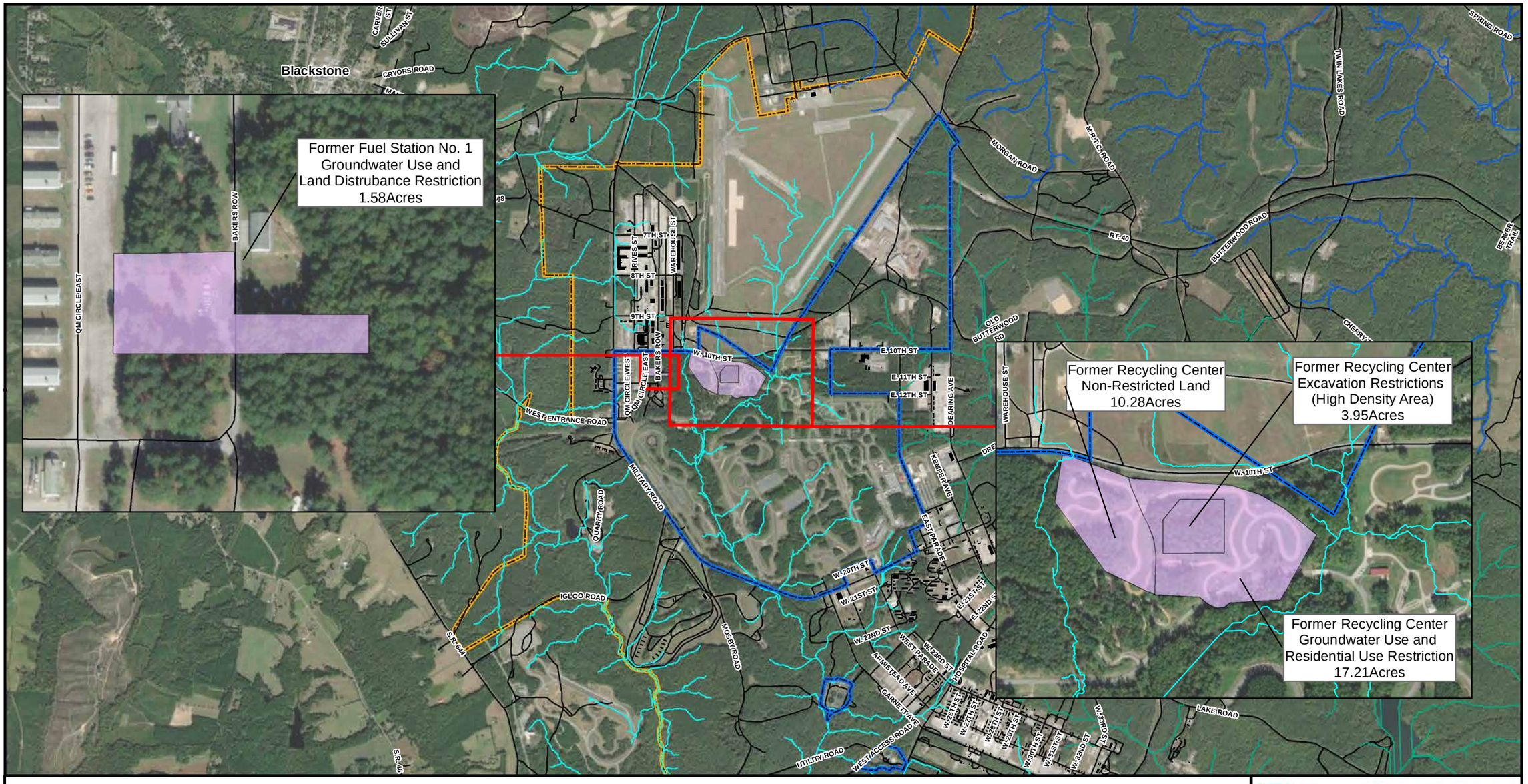
PARCEL TRANSFER MAP
FORT PICKETT
BLACKSTONE, VIRGINIA
FIGURE 2-2
DATE: 5/12/2023



Legend

- Land Use Control
- BRAC Boundary
- Installation/VAARNG Property Boundary
- Buildings
- Roads

Surface Water Feature

- Birchin Creek/Tributaries
- Hurricane Branch/Tributaries
- Tommeheton Creek/Tributaries

Notes:
Source: Esri, Maxar, Earthstar Geographics, and the GIS User CommunityAerial imagef from 2019.

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SCALE: 1" = 2,500'

IN STATE PLANE EAST (NAD83)

US Army Corps of Engineers

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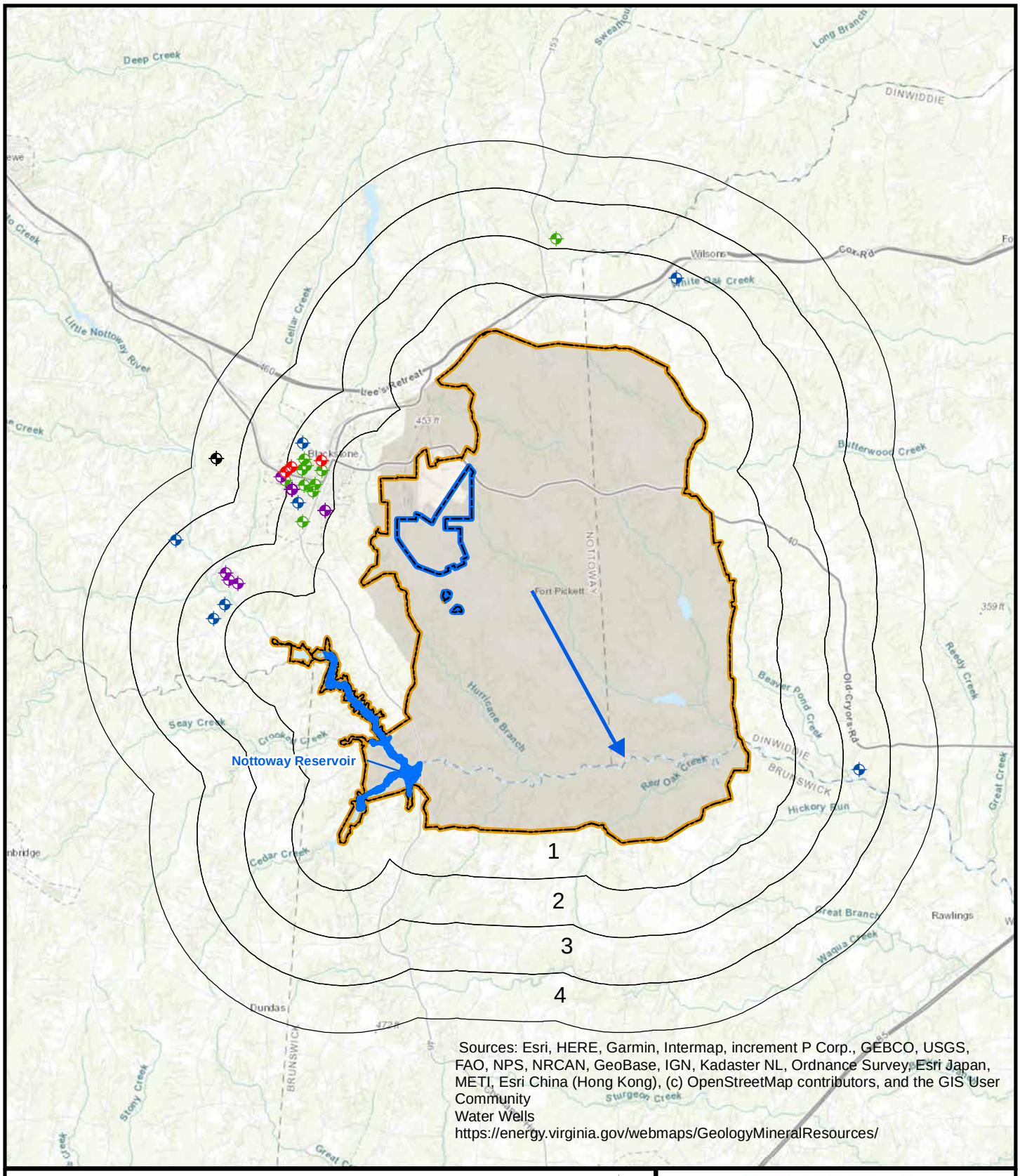
LAND USE CONTROLS
FORT PICKETT
BLACKSTONE, VIRGINIA

FIGURE 2-3 | DATE: 5/12/2023

C:\cad\21011\MXD\PA\Figure 2-3 Fort Pickett Land Use Controls.mxd



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Water Wells
https://energy.virginia.gov/webmaps/GeologyMineralResources/

Legend

- BRAC Boundary
- Installation/VAARNG Property Boundary
- Nottoway Reservoir
- Regional Groundwater Flow

Well Type

- Domestic
- Government
- Industrial
- Public
- Not Defined

0 8,000 16,000

SCALE: 1" = 15,000'

VA STATE PLANE SOUTH (NAD83)

US Army Corps of Engineers

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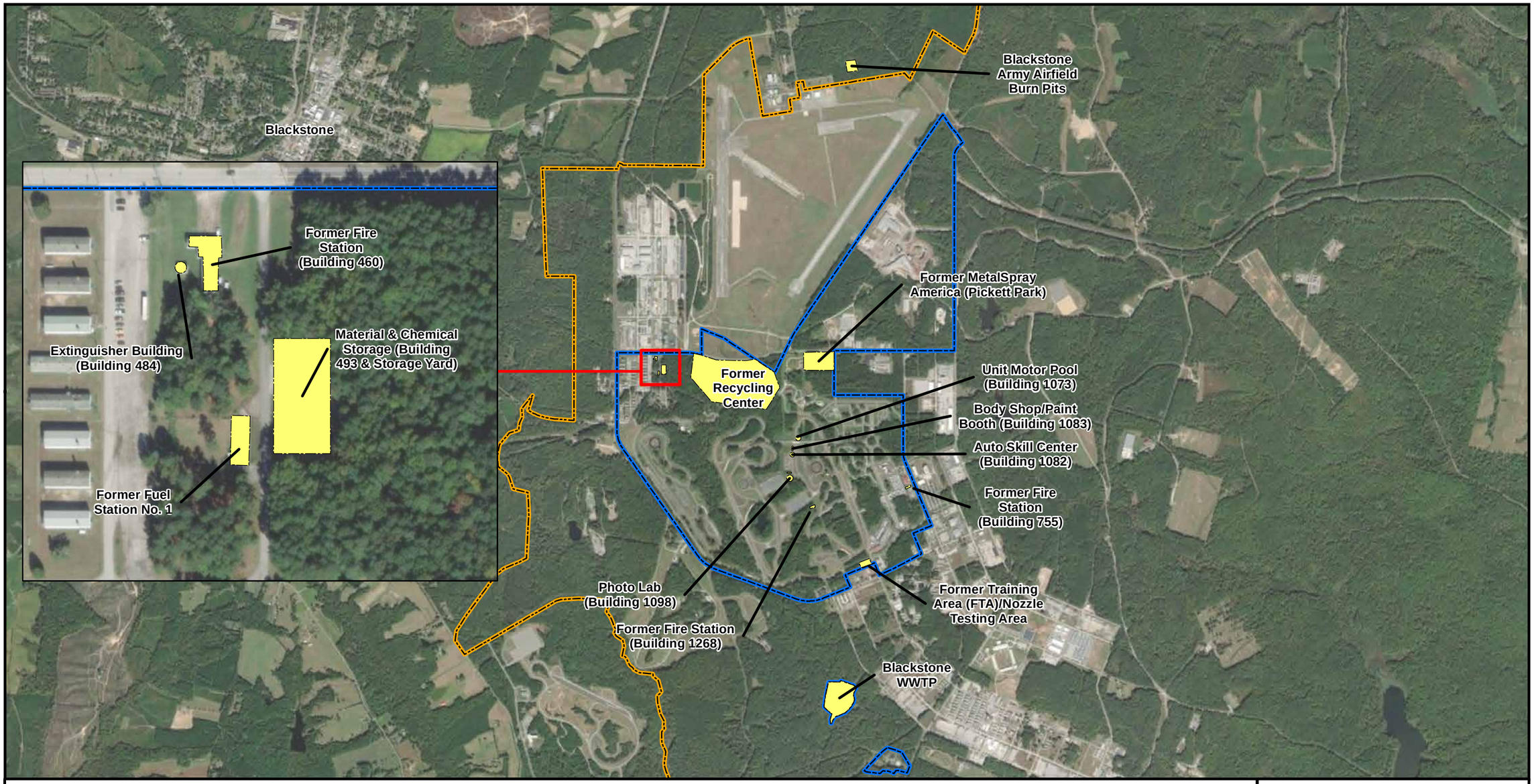
POTABLE WELLS WITHIN A 4-MILE RADIUS
FORT PICKETT
BLACKSTONE, VIRGINIA

FIGURE 2-4 | DATE: 7/7/2022



Legend

- BRAC Boundary
- Installation/VAARNG Property Boundary
- Evaluated Area

Notes:
Source: Esri, Maxar, Earthstar Geographics, and the GIS User CommunityAerial imagef from 10/23/2014.

0 2,000 4,000

SCALE: 1" = 2,500'

IN STATE PLANE EAST (NAD83)

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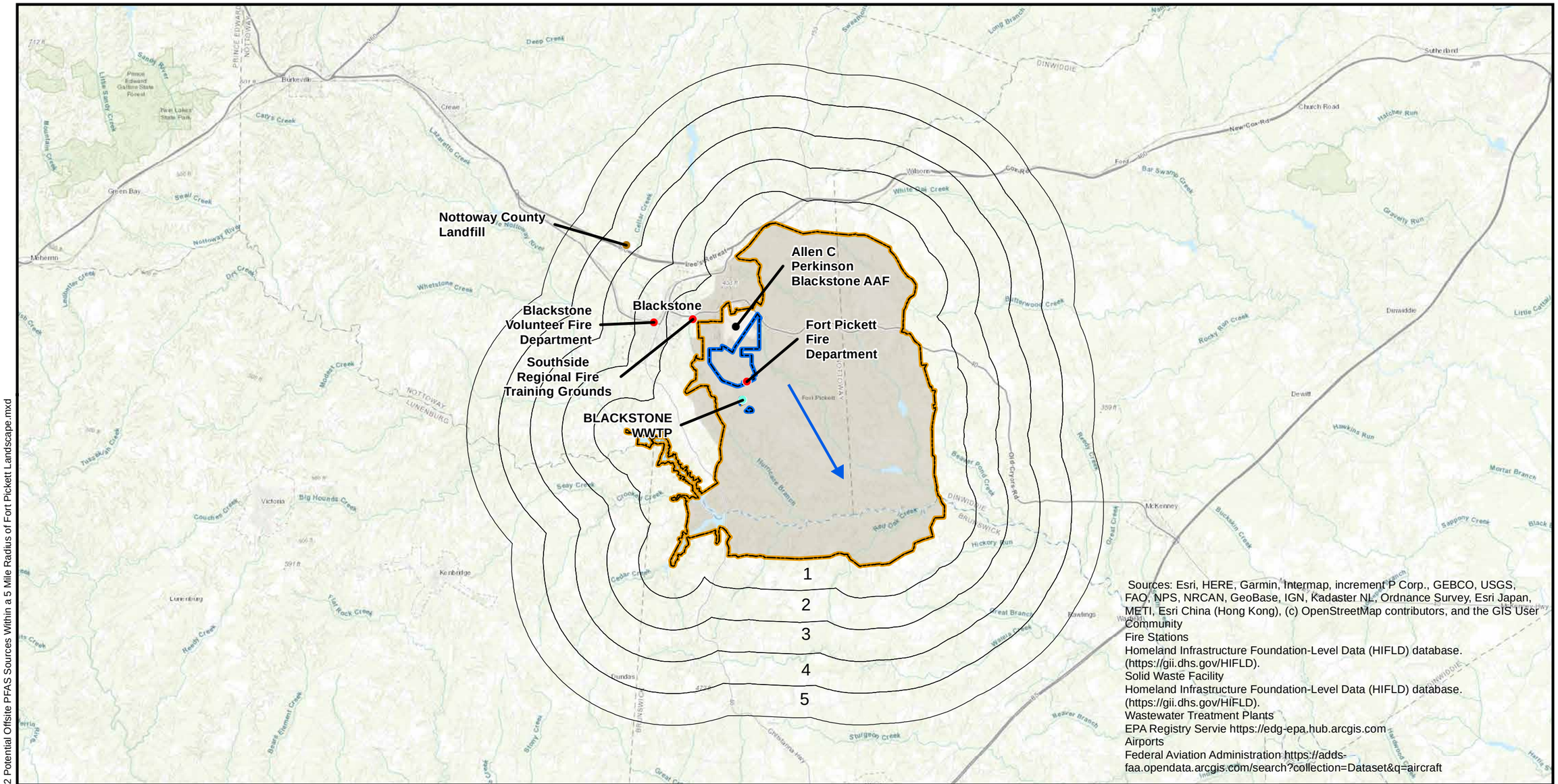
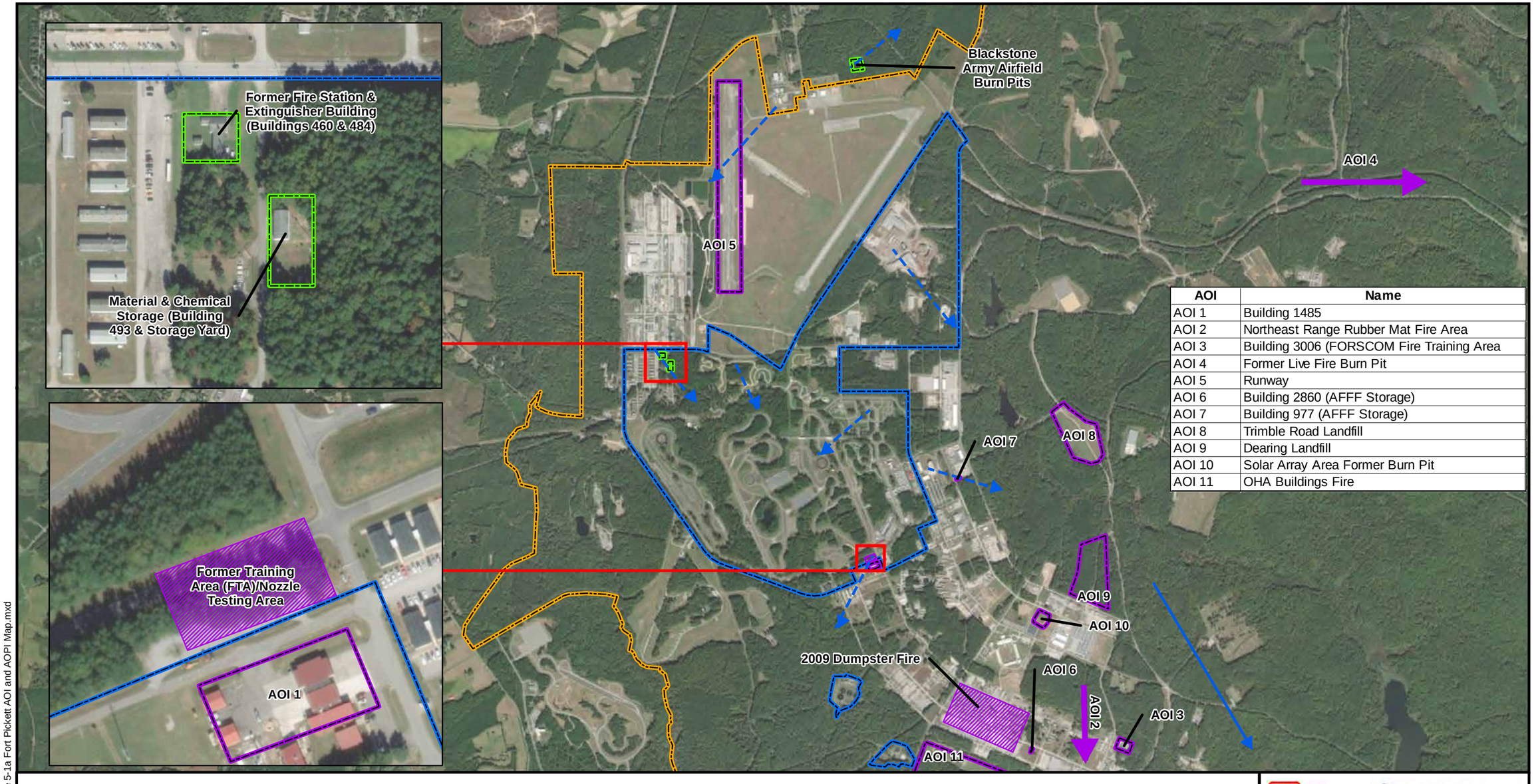
EVALUATED SITES
FORT PICKETT
BLACKSTONE, VIRGINIA

FIGURE 4-1 | DATE: 5/12/2023

C:\cad\21011\MXD\PA\Figure 4-1 Fort Pickett Evaluated Sites.mxd



C:\cad\21011\MXD\PA\Figure 4-2 Potential Offsite PFAS Sources Within a 5 Mile Radius of Fort Pickett Landscape.mxd



AOI	Name
AOI 1	Building 1485
AOI 2	Northeast Range Rubber Mat Fire Area
AOI 3	Building 3006 (FORSCOM Fire Training Area
AOI 4	Former Live Fire Burn Pit
AOI 5	Runway
AOI 6	Building 2860 (AFFF Storage)
AOI 7	Building 977 (AFFF Storage)
AOI 8	Trimble Road Landfill
AOI 9	Dearing Landfill
AOI 10	Solar Array Area Former Burn Pit
AOI 11	OHA Buildings Fire

Legend

- BRAC Boundary
- Installation/VAARNG Property Boundary
- Potential PFAS Use/Release Area - Post BRAC Transfer
- Area of Potential Interest (AOPI)
- VAARNG PFAS Area of Interest (AOI)
- Localized Groundwater Flow
- Regional Groundwater Flow

Notes:
Source: Esri, Maxar, Earthstar Geographics, and the GIS User CommunityAerial imagef from 10/23/2014.

0 2,000 4,000
SCALE: 1" = 2,500'

IN STATE PLANE EAST N (NAD83)

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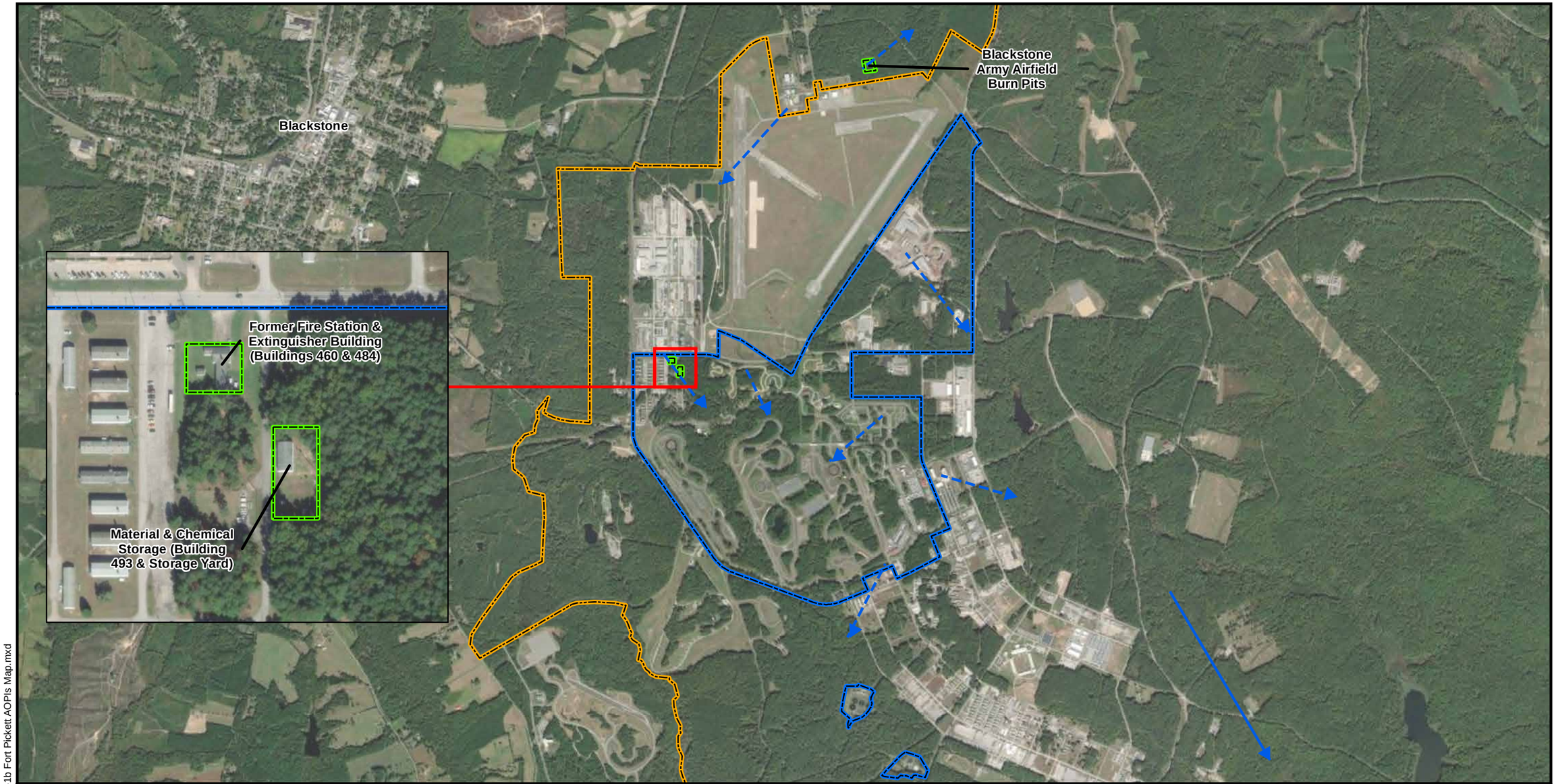
BRAC PROPERTY AOPI AND VAARNG AOI MAP
FORT PICKETT
BLACKSTONE, VIRGINIA

FIGURE 5-1a | DATE: 4/3/2023

C:\cad\21011MXD\PA\Figure 5-1a Fort Pickett AOI and AOPI Map.mxd



Legend

- BRAC Boundary
- Installation/VAARNG Property Boundary
- Area of Potential Interest (AOPI)
- Localized Groundwater Flow
- Regional Groundwater Flow

Notes:
Source: Esri, Maxar, Earthstar Geographics, and the GIS User CommunityAerial imagef from 10/23/2014.

0 2,000 4,000

SCALE: 1" = 2,500'

IN STATE PLANE EAST N (NAD83)

US Army Corps of Engineers

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BRAC PROPERTY AOPI MAP
FORT PICKETT
BLACKSTONE, VIRGINIA

FIGURE 5-1b | DATE: 4/3/2023

C:\cad\21011\MXD\PA\Figure 5-1b Fort Pickett AOPIs Map.mxd