PRELIMINARY ASSESSMENT/ SITE INSPECTION ADDENDUM

OFF- POST PRIVATE WELL INVESTIGATION OF PER- AND POLYFLOUROALKYL SUBSTANCES

Fort Rucker, Alabama
(Subsequently renamed Fort Novosel)

Contract No.: W912DR-18-D-0004
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Prepared For:
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Baltimore, Maryland 21201

November 2023

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EXECUTIVE SUMMARY

The United States Army (Army) is performing Preliminary Assessments (PAs) and Site Inspections (SIs) to evaluate the current or potential historical use of per-and polyfluoroalkyl substances (PFAS) at Army installations nationwide. These efforts were completed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), National Oil and Hazardous Substances Pollution Contingency Plan, and Army/Department of Defense policy and guidance.

The SI sampling at Fort Rucker, Alabama, detected concentrations of perfluorooctane sulfonate (PFOS) and/or perfluorooctanoic acid (PFOA) in groundwater on-post, where an evaluation of local groundwater flow identified possible impacts to off-post drinking water wells. To evaluate possible PFOS/PFOA impacts to off-post drinking water sources, the Army conducted off-post sampling at private drinking water wells that appeared to be hydrologically connected to groundwater beneath Fort Rucker.

Seventeen (17) private drinking water wells were sampled. No locations had PFOS/PFOA concentrations exceeding the 2016 United States Environmental Protection Agency's (USEPA) Lifetime Health Advisory of 70 parts per trillion individually or combined. The Army has initiated a Remedial Investigation at Fort Rucker to further delineate the nature and extent of the PFAS releases on-post and to evaluate whether there is a risk posed to human health from the releases.

1 INTRODUCTION

The purpose of this Preliminary Assessment (PA)/Site Inspection (SI) Addendum is to document analytical results and findings in response to the separate investigation of perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) in off-post drinking water potentially associated with past United States Army (Army) operations at Fort Rucker, Alabama. This addendum, while documenting the separate off-post investigation, serves to supplement the PA/SI report prepared by Arcadis U.S., Inc. (Arcadis; Arcadis 2022).

The Army conducted a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) PA/SI to assess potential impacts from per- and polyfluoroalkyl substances (PFAS) at Fort Rucker. Thirty-eight (38) areas of potential interest (AOPIs) were identified at 28 operational locations during the PA/SI (**Figure 1**). The AOPIs are located at the main post and at numerous non-contiguous stage fields. PFOS and PFOA are two chemicals included in the larger class of PFAS. Concentrations of PFOS and PFOA in groundwater on-post at or downgradient of AOPIs identified at Fort Rucker exceeded the 70 parts per trillion (ppt) 2016 United State Environmental Protection Agency (USEPA) Lifetime Health Advisory for drinking water.

Due to the exceedances for PFOS and PFOA in groundwater at or downgradient of the AOPIs, the close proximity of the AOPIs to the installation boundary, and the potential for groundwater emanating from these AOPIs to affect downgradient off-post receptors, the Army identified the need for this off-post private well sampling. Groundwater originating at the AOPIs flows off-post.

To identify potable wells downgradient of the installation boundary near the AOPIs, an off-post well survey was completed for off-post drinking water wells using available information. Wells were identified for possible sampling as part of this effort based on the understanding of the relationship between on- and off-post hydrogeological conditions. To corroborate where potential wells may be located in the evaluation area, parcel data were reviewed in conjunction with Zillow real estate data, satellite imagery, ArcGIS data for water utility lines, State of Alabama well records, installation records, and an Environmental Data Resources DataMap™ Well Search Report. Fort Rucker personnel then sent questionnaires to parcel owners about any wells on the premises and asked for access permission to sample their drinking water wells. Based on the initial response, Fort Rucker personnel resent questionnaires to nonrespondents. After review of the questionnaires and permission slips, off-post drinking water wells were sampled in the downgradient areas shown on **Figure 2**. The off-post drinking water sampling took place in October 2021. A total of 17 primary off-post samples were collected with associated quality control samples as part of the off-post receptor evaluation. Locations of the individual wells sampled are not shown in this report to protect the privacy of the residential homeowners.

2 SAMPLING PLAN

Drinking water samples were collected during one field mobilization in accordance with Army and USEPA guidance for PFAS in potable water. A total of 17 parent samples were collected (from 15 locations, one of which had three wells onsite) from locations in the area shown on **Figure 2**. Quality assurance/quality control samples included two duplicates, two matrix spikes/matrix spike duplicates, and three field reagent blanks.

Unlined, high-density polyethylene bottles were used to sample unfiltered (if possible) outdoor spigots, wells, or hose bibs. Water was purged from the sampling collection point for approximately 3 minutes before collecting the samples. Purged water was discharged to the ground surface near the point of collection. New nitrile gloves were used for each individual sample collection. Once collected, the samples were properly labeled, placed in sealed Ziploc® bags, and preserved on ice to maintain a temperature between 0 and 4 degrees Celsius.

Pace Analytical Services laboratory in West Columbia, South Carolina, analyzed the samples collected during the off-post field sampling event. Pace Analytical Services holds a Department of Defense (DoD) Environmental Laboratory Accreditation Program certification. PFAS analyses were conducted in accordance with USEPA drinking water Method 537.1.

3 DETECTIONS AND EXCEEDANCES

Of the 17 primary drinking water samples collected, no samples had detections of PFOS or PFOA. All sampling results were provided to their respective well owners. **Table 1** provides a summary of the PFOS and PFOA analytical results for all samples collected. The full PFAS analytical results for samples collected during the off-post assessment are included in **Attachment 1**.

4 DATA VALIDATION

Each laboratory data package/sample delivery group underwent 100% review of Stage 3 data packages and 10% review of the raw Stage 4 data packages for validation in accordance with DoD Quality Systems Manual 5.3 (DoD and Department of Energy 2019). The results for drinking water samples collected were found to be acceptable and usable for evaluation against the screening criteria for PFOS and PFOA with the laboratory and validation qualifications documented in the data usability summary report (**Attachment 2**); no results were rejected. Qualifiers for data are shown in **Table 1** and **Attachment 1** and are defined in the notes of the tables.

5 SUBSEQUENT ACTIONS

The Army has initiated a CERCLA Remedial Investigation at Fort Rucker to further delineate the nature and extent of the PFAS releases identified on-post and to evaluate any potential risk posed to human health from the releases.

6 SUMMARY

Off-post sampling of residential drinking water wells downgradient of Fort Rucker occurred in October 2021. During the sampling event, 17 parent samples and applicable quality assurance/quality control samples were collected, analyzed and validated in accordance with Army and USEPA guidance for PFAS in potable water. None of the samples collected had detectable concentrations of PFOS and/or PFOA.

The Army has initiated a Remedial Investigation at Fort Rucker to further delineate the nature and extent of the PFAS releases identified on post and to evaluate any potential risk posed to human health from the releases.

7 REFERENCES

Arcadis U.S., Inc (Arcadis). 2022. Final Preliminary Assessment and Site Inspection of Per- and Polyfluoroalkyl Substances, Fort Rucker, Alabama. November.

Department of Defense (DoD) and Department of Energy. 2019. Consolidated Quality Systems Manual for Environmental Laboratories, Version 5.3. May.

United States Environmental Protection Agency (USEPA). 2016. Lifetime Health Advisories and Health Effects Support Documents for Perfluorooctanoic Acid and Perfluorooctane Sulfonate. EPA-HQ- OW-2014-0138; FRL-9946-91-OW. Federal Register/ Vol. 81. No. 101. 25 May.

TABLE

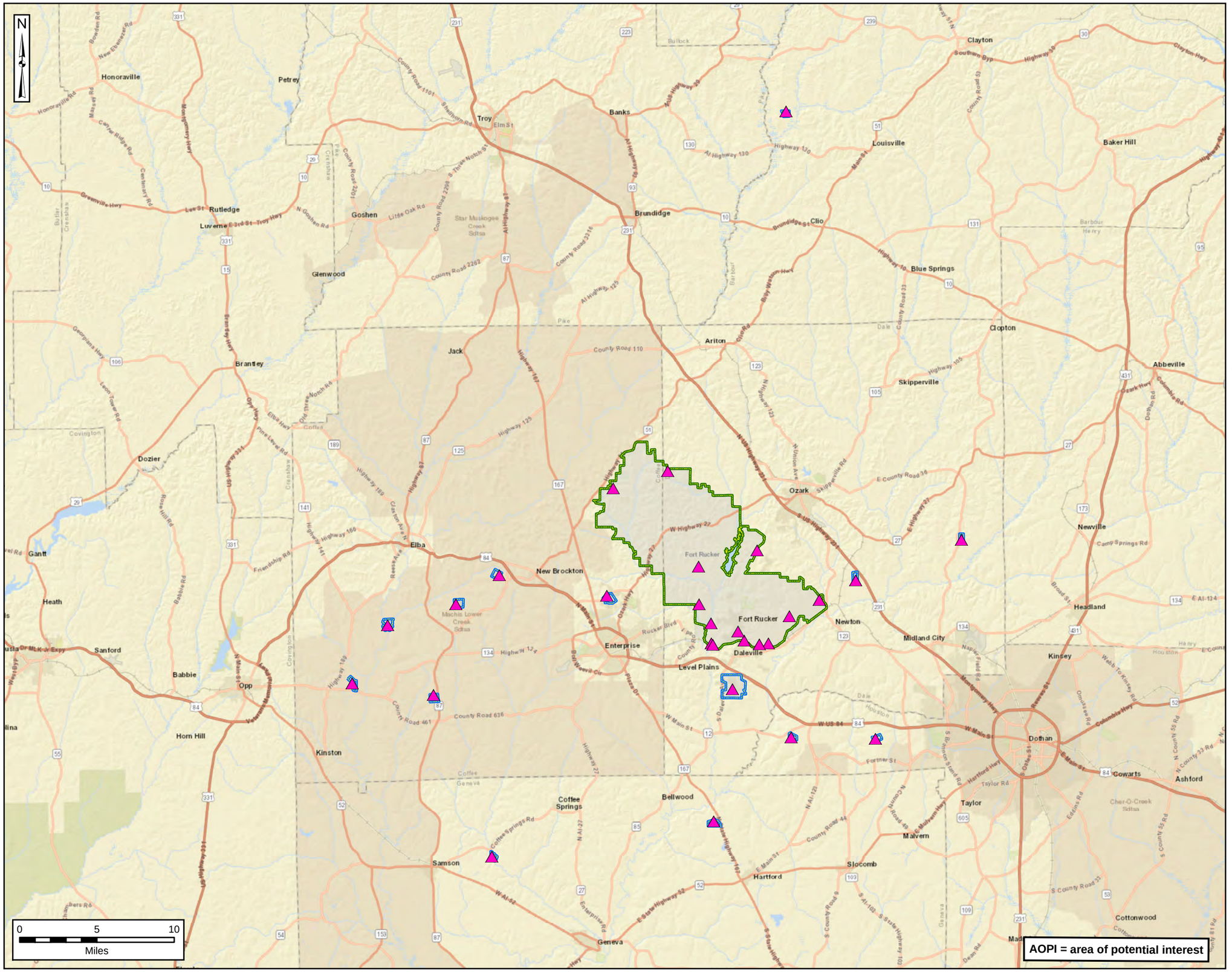
Table 1 - Off-Post PFOS and PFOA Analytical Data Results
Fort Rucker, Alabama
USAEC PFAS Preliminary Assesssment/Site Inspection Addendum

Location	Sample ID	Sample Date	Sample Type	PFOS (ng/L)		PFOA (ng/L)	
				Result	Qual	Result	Qual
FTR-OFFP-01	FTR-OFFP-01-DW-101921	10/19/2021	N	2.1	U	2.1	U
FTR-OFFP-02	FTR-OFFP-02-DW-101921	10/19/2021	N	2.1	U	2.1	U
	FTR-OFFP-DUP-02-101921	10/19/2021	FD	2.1	U	2.1	U
FTR-OFFP-03	FTR-OFFP-03-DW-102021	10/20/2021	N	2.1	U	2.1	U
FTR-OFFP-06	FTR-OFFP-06-DW-101921	10/19/2021	N	2.0	U	2.0	U
FTR-OFFP-10A	FTR-OFFP-10A-DW-102021	10/20/2021	N	2.2	U	2.2	U
FTR-OFFP-10B	FTR-OFFP-10B-DW-102021	10/20/2021	N	2.0	U	2.0	U
FTR-OFFP-10C	FTR-OFFP-10C-DW-102021	10/20/2021	N	2.4	U	2.4	U
FTR-OFFP-11	FTR-OFFP-11-DW-102021	10/20/2021	N	2.2	U	2.2	U
FTR-OFFP-12	FTR-OFFP-12-DW-101821	10/18/2021	N	2.0	U	2.0	U
FTR-OFFP-13	FTR-OFFP-13-DW-101921	10/19/2021	N	2.1	U	2.1	U
FTR-OFFP-14	FTR-OFFP-14-DW-101921	10/19/2021	N	2.1	U	2.1	U
FTR-OFFP-16	FTR-OFFP-16-DW-101921	10/19/2021	N	2.1	U	2.1	U
FTR-OFFP-17	FTR-OFFP-17-DW-101921	10/19/2021	N	2.1	U	2.1	U
FTR-OFFP-18	FTR-OFFP-18-DW-101921	10/19/2021	N	2.2	U	2.2	U
FTR-OFFP-19	FTR-OFFP-19-DW-101921	10/19/2021	N	2.2	UJ	2.2	UJ
FTR-OFFP-20	FTR-OFFP-20-DW-101821	10/18/2021	N	2.2	U	2.2	U
	FTR-OFFP-DUP-01-101821	10/18/2021	FD	2.0	U	2.0	U
FTR-OFFP-23	FTR-OFFP-23-DW-101921	10/19/2021	N	2.1	U	2.1	U

Acronyms/Abbreviations:
FD = field duplicate sample
FTR= Fort Rucker, Alabama
ID = identification
N = primary sample
ng/L = nanograms per liter (parts per trillion)
OFFP = off-post
PFOA = Perfluorooctanoic Acid
PFOS = Perfluorooctane Sulfonate

Qualifiers (Qual):
U = The analyte was analyzed for but the result was not detected above the limit of quantitation.
UJ = The analyte was analyzed for but was not detected. The reported limit of quantitation is approximate and may be inaccurate or imprecise.

FIGURES



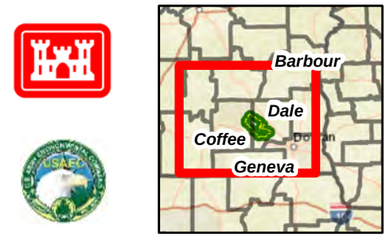


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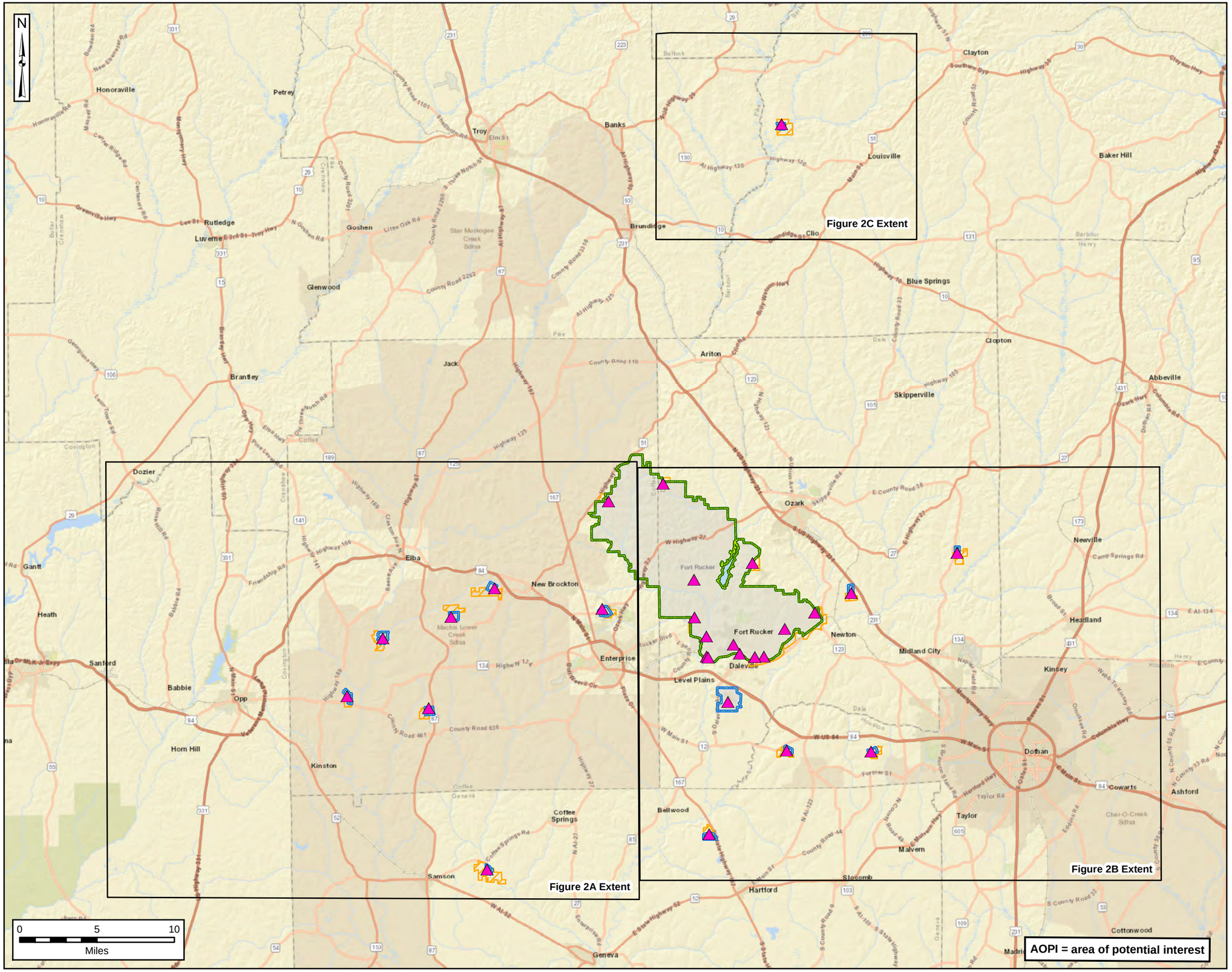
Figure 1 - AOPI Locations

Legend

- Main Post
- Outlying Range
- AOPI Location

Data Sources:
Fort Rucker, GIS Data, 2019
ESRI ArcGIS Online, StreetMap Data

Coordinate System:
WGS 1984, UTM Zone 16 North



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USAEC PFAS Preliminary Assessment / Site Inspection Addendum, Fort Rucker AL

Figure 2
Off-Post Evaluation Areas

Legend

- Main Post
- Outlying Range
- AOPI Location
- Off-Post Evaluation Areas

Data Sources:
Fort Rucker, GIS Data, 2019
ESRI ArcGIS Online, StreetMap Data

Coordinate System:
WGS 1984, UTM Zone 16 North

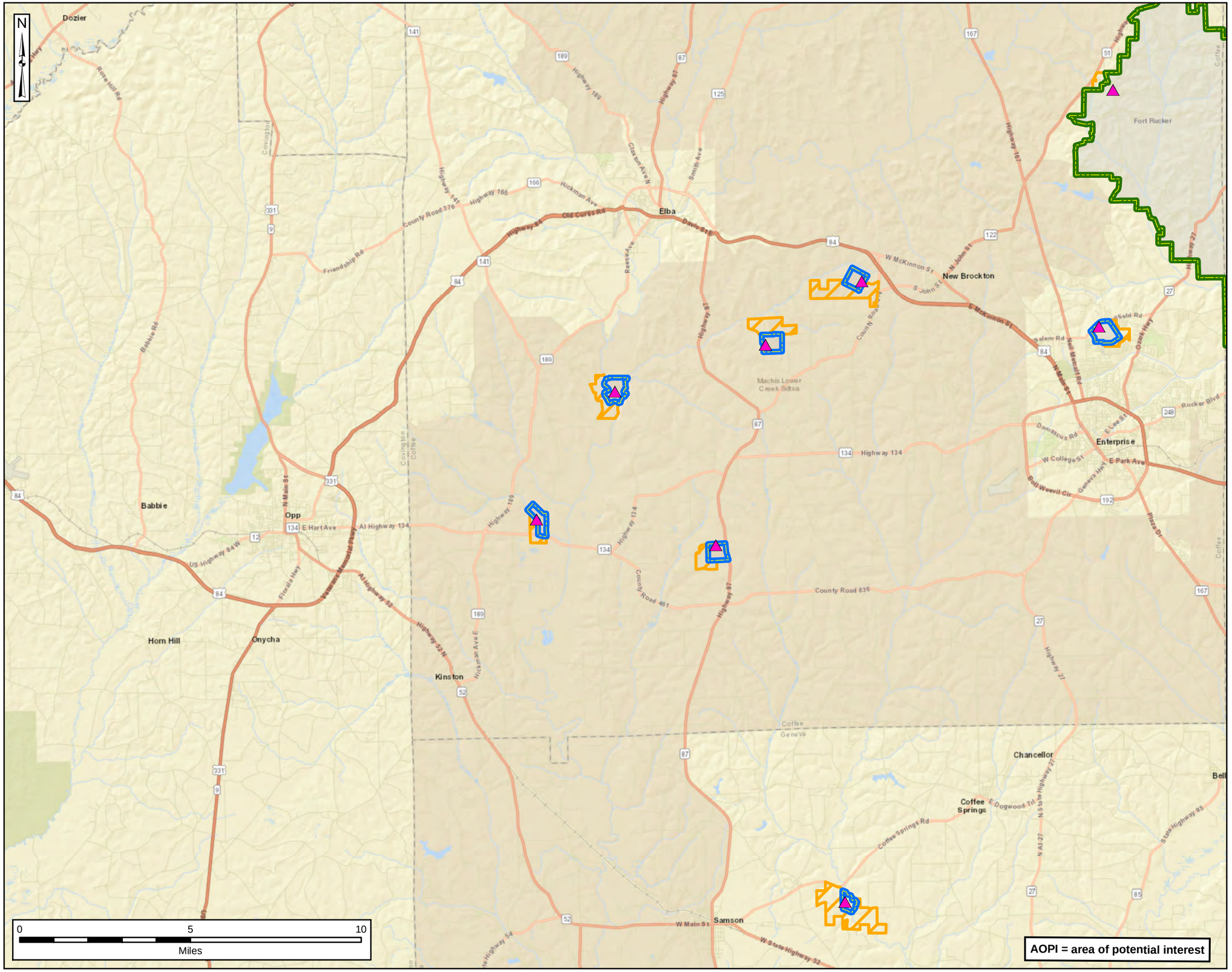

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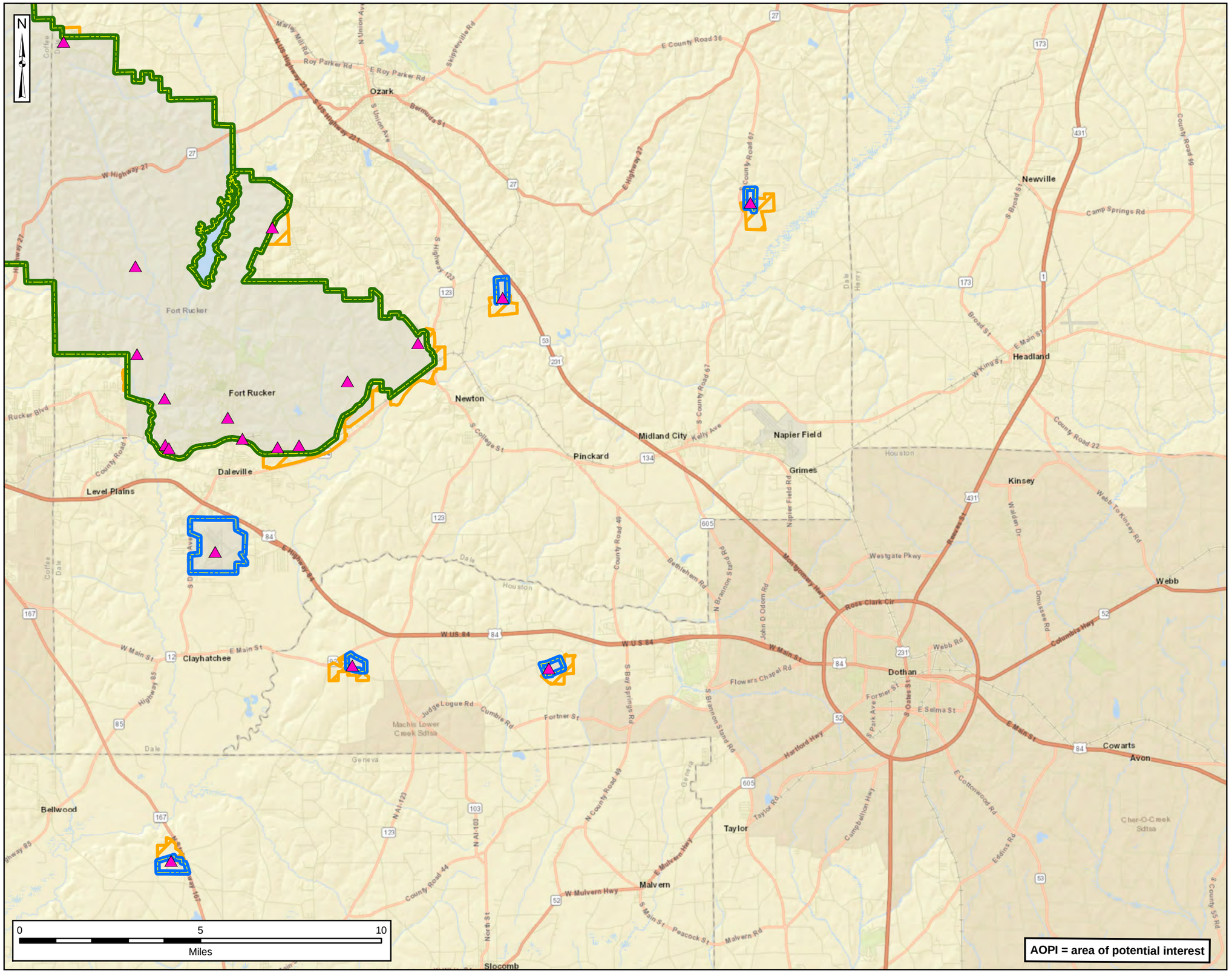
Figure 2A
Off-Post Evaluation Areas

Legend

- Main Post
- Outlying Range
- AOPI Location
- Off-Post Evaluation Areas

Data Sources:
Fort Rucker, GIS Data, 2019
ESRI ArcGIS Online, StreetMap Data

Coordinate System:
WGS 1984, UTM Zone 16 North



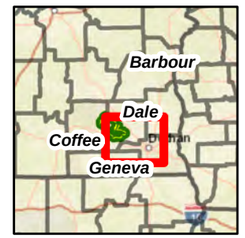


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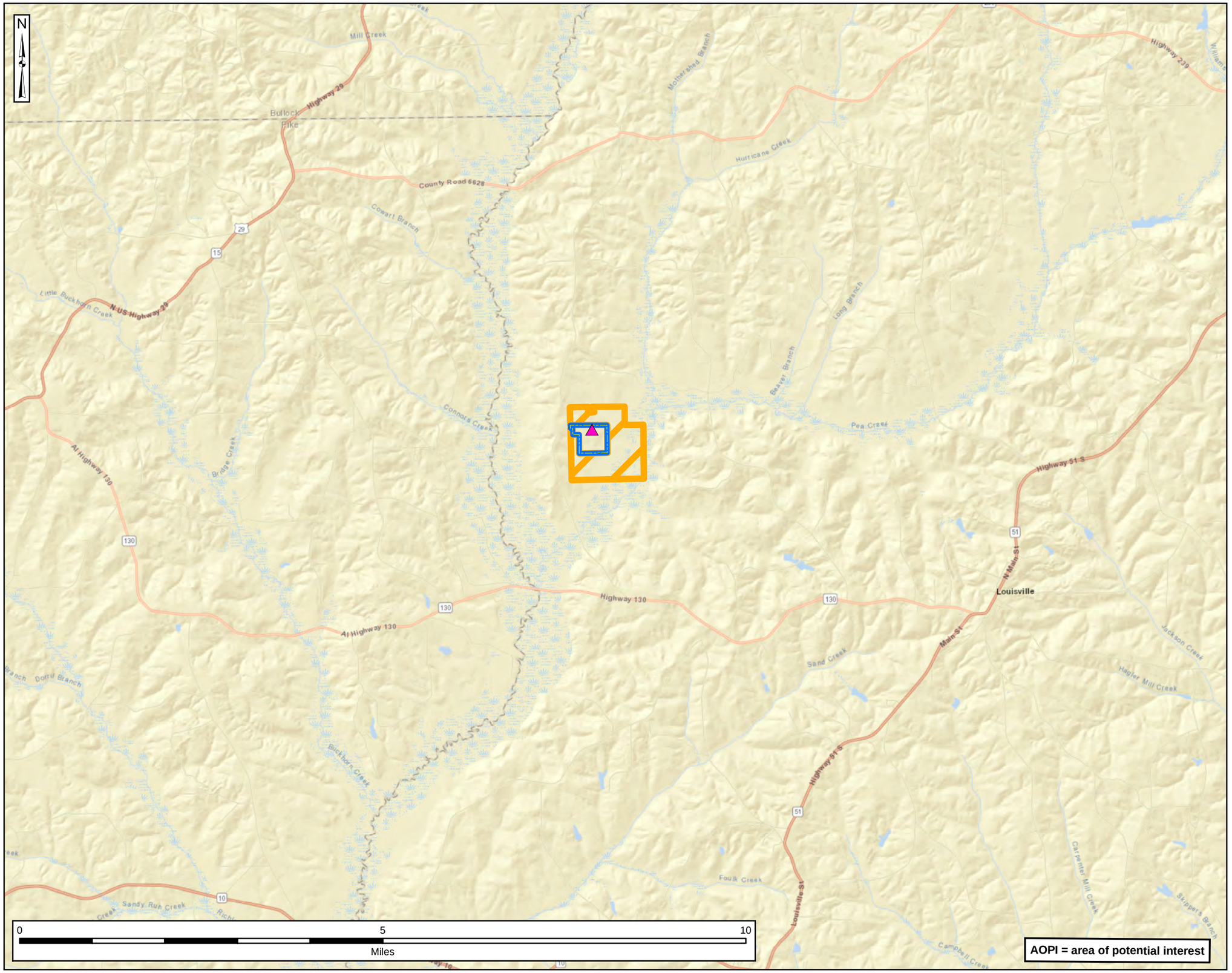
Figure 2B
Off-Post Evaluation Areas

Legend

- Main Post
- Outlying Range
- AOPI Location
- Off-Post Evaluation Areas

Data Sources:
Fort Rucker, GIS Data, 2019
ESRI ArcGIS Online, StreetMap Data

Coordinate System:
WGS 1984, UTM Zone 16 North



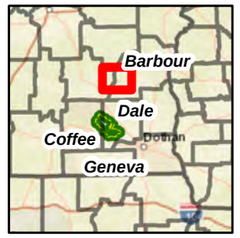


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Figure 2C
Off-Post Evaluation Area

Legend

- Outlying Range
- AOPI Location
- Off-Post Evaluation Area

Data Sources:
Fort Rucker, GIS Data, 2019
ESRI ArcGIS Online, StreetMap Data

Coordinate System:
WGS 1984, UTM Zone 16 North

ATTACHMENT 1

Validated Analytical Data Tables

Attachment 1 - Validated Analytical Data Table
Fort Rucker, Alabama
USACE PFAS Preliminary Assessment/Site Inspection Addendum

Location			FTR-OFFP-01		FTR-OFFP-02		FTR-OFFP-02		FTR-OFFP-03	
Sample/Parent ID			FTR-OFFP-01-DW-101921		FTR-OFFP-02-DW-101921		FTR-OFFP-DUP-02-101921 / FTR-OFFP-02-DW-101921		FTR-OFFP-03-DW-102021	
Sample Date			10/19/2021		10/19/2021		10/19/2021		10/20/2021	
Sample Type			N		N		FD		N	
Analyte	**CAS**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS										
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.1	U	2.1	U	2.1	U	2.1	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	8.2	U	8.4	U	8.4	U	8.5	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.1	U	2.1	U	2.1	U	2.1	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.1	U	2.1	U	2.1	U	2.1	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.1	U	2.1	U	2.1	U	2.1	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.1	U	2.1	U	2.1	U	2.1	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	2.1	U	2.1	U	2.1	U	2.1	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.1	U	2.1	U	2.1	U	2.1	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.1	U	2.1	U	2.1	U	2.1	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	2.1	U	2.1	U	2.1	U	2.1	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	2.1	U	2.1	U	2.1	U	**7.0**	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	2.1	U	2.1	U	2.1	U	2.1	U

Attachment 1 - Validated Analytical Data Table
Fort Rucker, Alabama
USACE PFAS Preliminary Assessment/Site Inspection Addendum

Location			FTR-OFFP-01		FTR-OFFP-02		FTR-OFFP-02		FTR-OFFP-03	
Sample/Parent ID			FTR-OFFP-01-DW-101921		FTR-OFFP-02-DW-101921		FTR-OFFP-DUP-02-101921 / FTR-OFFP-02-DW-101921		FTR-OFFP-03-DW-102021	
Sample Date			10/19/2021		10/19/2021		10/19/2021		10/20/2021	
Sample Type			N		N		FD		N	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.1	U	2.1	U	2.1	U	2.1	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	2.1	U	2.1	U	2.1	U	2.1	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	2.1	U	2.1	U	2.1	U	2.1	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.1	U	2.1	U	2.1	U	2.1	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.1	U	2.1	U	2.1	U	2.1	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.1	U	2.1	U	2.1	U	2.1	U

Attachment 1 - Validated Analytical Data Table
Fort Rucker, Alabama
USACE PFAS Preliminary Assessment/Site Inspection Addendum

Location			FTR-OFFP-06		FTR-OFFP-10A		FTR-OFFP-10B		FTR-OFFP-10C	
Sample/Parent ID			FTR-OFFP-06-DW-101921		FTR-OFFP-10A-DW-102021		FTR-OFFP-10B-DW-102021		FTR-OFFP-10C-DW-102021	
Sample Date			10/19/2021		10/20/2021		10/20/2021		10/20/2021	
Sample Type			N		N		N		N	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS										
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.0	U	2.2	U	2.0	U	2.4	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	8.1	U	8.8	U	8.2	U	9.5	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.0	U	2.2	U	2.0	U	2.4	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.0	U	2.2	U	2.0	U	2.4	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.0	U	2.2	U	2.0	U	2.4	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.0	U	2.2	U	2.0	U	2.4	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	2.0	U	2.2	U	2.0	U	2.4	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.0	U	2.2	U	2.0	U	2.4	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.0	U	2.2	U	2.0	U	2.4	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	2.0	U	2.2	U	2.0	U	2.4	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	2.0	U	**5.7**		2.0	U	2.4	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	2.0	U	2.2	U	2.0	U	2.4	U

Attachment 1 - Validated Analytical Data Table
Fort Rucker, Alabama
USACE PFAS Preliminary Assessment/Site Inspection Addendum

Location			FTR-OFFP-06		FTR-OFFP-10A		FTR-OFFP-10B		FTR-OFFP-10C	
Sample/Parent ID			FTR-OFFP-06-DW-101921		FTR-OFFP-10A-DW-102021		FTR-OFFP-10B-DW-102021		FTR-OFFP-10C-DW-102021	
Sample Date			10/19/2021		10/20/2021		10/20/2021		10/20/2021	
Sample Type			N		N		N		N	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.0	U	2.2	U	2.0	U	2.4	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	2.0	U	2.2	U	2.0	U	2.4	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	2.0	U	2.2	U	2.0	U	2.4	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.0	U	2.2	U	2.0	U	2.4	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.0	U	2.2	U	2.0	U	2.4	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.0	U	2.2	U	2.0	U	2.4	U

Attachment 1 - Validated Analytical Data Table
Fort Rucker, Alabama
USACE PFAS Preliminary Assessment/Site Inspection Addendum

Location			FTR-OFFP-11		FTR-OFFP-12		FTR-OFFP-13		FTR-OFFP-14	
Sample/Parent ID			FTR-OFFP-11-DW-102021		FTR-OFFP-12-DW-101821		FTR-OFFP-13-DW-101921		FTR-OFFP-14-DW-101921	
Sample Date			10/20/2021		10/18/2021		10/19/2021		10/19/2021	
Sample Type			N		N		N		N	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS										
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.2	U	2.0	U	2.1	U	2.1	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	8.7	U	8.1	U	8.4	U	8.2	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.2	U	2.0	U	2.1	U	2.1	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.2	U	2.0	U	2.1	U	2.1	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.2	U	2.0	U	2.1	U	2.1	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.2	U	2.0	U	2.1	U	2.1	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	2.2	U	2.0	U	2.1	U	2.1	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.2	U	2.0	U	2.1	U	2.1	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.2	U	2.0	U	2.1	U	2.1	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	2.2	U	2.0	U	2.1	U	2.1	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	2.2	U	2.0	U	2.1	U	2.1	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	2.2	U	2.0	U	2.1	U	2.1	U

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Location			FTR-OFFP-11		FTR-OFFP-12		FTR-OFFP-13		FTR-OFFP-14	
Sample/Parent ID			FTR-OFFP-11-DW-102021		FTR-OFFP-12-DW-101821		FTR-OFFP-13-DW-101921		FTR-OFFP-14-DW-101921	
Sample Date			10/20/2021		10/18/2021		10/19/2021		10/19/2021	
Sample Type			N		N		N		N	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.2	U	2.0	U	2.1	U	2.1	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	2.2	U	2.0	U	2.1	U	2.1	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	2.2	U	2.0	U	2.1	U	2.1	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.2	U	2.0	U	2.1	U	2.1	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.2	U	2.0	U	2.1	U	2.1	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.2	U	2.0	U	2.1	U	2.1	U

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Location			FTR-OFFP-16		FTR-OFFP-17		FTR-OFFP-18		FTR-OFFP-19	
Sample/Parent ID			FTR-OFFP-16-DW-101921		FTR-OFFP-17-DW-101921		FTR-OFFP-18-DW-101921		FTR-OFFP-19-DW-101921	
Sample Date			10/19/2021		10/19/2021		10/19/2021		10/19/2021	
Sample Type			N		N		N		N	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS										
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.1	U	2.1	U	2.2	U	2.2	UJ
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	8.4	U	8.5	U	8.8	U	8.7	UJ
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.1	U	2.1	U	2.2	U	2.2	UJ
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.1	U	2.1	U	2.2	U	2.2	UJ
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.1	U	2.1	U	2.2	U	2.2	UJ
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.1	U	2.1	U	2.2	U	2.2	UJ
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	2.1	U	2.1	U	2.2	U	**4.6**	J
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.1	U	2.1	U	2.2	U	2.2	UJ
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.1	U	2.1	U	2.2	U	2.2	UJ
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	2.1	U	2.1	U	2.2	U	2.2	UJ
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	2.1	U	2.1	U	2.2	U	**3.3**	J
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	2.1	U	2.1	U	2.2	U	**2.3**	J

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Location			FTR-OFFP-16		FTR-OFFP-17		FTR-OFFP-18		FTR-OFFP-19	
Sample/Parent ID			FTR-OFFP-16-DW-101921		FTR-OFFP-17-DW-101921		FTR-OFFP-18-DW-101921		FTR-OFFP-19-DW-101921	
Sample Date			10/19/2021		10/19/2021		10/19/2021		10/19/2021	
Sample Type			N		N		N		N	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.1	U	2.1	U	2.2	U	2.2	UJ
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	2.1	U	2.1	U	2.2	U	2.2	UJ
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	2.1	U	2.1	U	2.2	U	2.2	UJ
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.1	U	2.1	U	2.2	U	2.2	UJ
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.1	U	2.1	U	2.2	U	2.2	UJ
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.1	U	2.1	U	2.2	U	2.2	UJ

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			Location		FTR-OFFP-20		FTR-OFFP-20		FTR-OFFP-23		N/A	
			Sample/Parent ID		FTR-OFFP-20-DW-101821		FTR-OFFP-DUP-01-101821 / FTR-OFFP-20-DW-101821		FTR-OFFP-23-DW-101921		FTR-OFFP-FB-101821	
			Sample Date		10/18/2021		10/18/2021		10/19/2021		10/18/2021	
			Sample Type		N		FD		N		FRB	
Analyte	**CAS**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**		
PFAS												
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	2.2	U	2.0	U	2.1	U	2.2	U		
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	8.9	U	8.0	U	8.2	U	8.7	U		
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	2.2	U	2.0	U	2.1	U	2.2	U		
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	2.2	U	2.0	U	2.1	U	2.2	U		
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	2.2	U	2.0	U	2.1	U	2.2	U		
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	2.2	U	2.0	U	2.1	U	2.2	U		
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	2.2	U	2.0	U	2.1	U	2.2	U		
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.2	U	2.0	U	2.1	U	2.2	U		
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	2.2	U	2.0	U	2.1	U	2.2	U		
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	2.2	U	2.0	U	2.1	U	2.2	U		
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	2.2	U	2.0	U	2.1	U	2.2	U		
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	2.2	U	2.0	U	2.1	U	2.2	U		

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		Location	FTR-OFFP-20		FTR-OFFP-20		FTR-OFFP-23		N/A	
		Sample/Parent ID	FTR-OFFP-20-DW-101821		FTR-OFFP-DUP-01-101821 / FTR-OFFP-20-DW-101821		FTR-OFFP-23-DW-101921		FTR-OFFP-FB-101821	
		Sample Date	10/18/2021		10/18/2021		10/19/2021		10/18/2021	
		Sample Type	N		FD		N		FRB	
Analyte	CAS	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	2.2	U	2.0	U	2.1	U	2.2	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	2.2	U	2.0	U	2.1	U	2.2	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	2.2	U	2.0	U	2.1	U	2.2	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	2.2	U	2.0	U	2.1	U	2.2	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	2.2	U	2.0	U	2.1	U	2.2	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	2.2	U	2.0	U	2.1	U	2.2	U

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		Location	N/A		N/A	
		Sample/Parent ID	FTR-OFFP-FB-101921		FTR-OFFP-FB-102021	
		Sample Date	10/19/2021		10/20/2021	
		Sample Type	FRB		FRB	
Analyte	CAS	Units	Result	Qual	Result	Qual
PFAS						
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	763051-92-9	ng/L	1.9	U	2.1	U
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propanoic acid (HFPO-DA)	13252-13-6	ng/L	7.7	U	8.6	U
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	919005-14-4	ng/L	1.9	U	2.1	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	ng/L	1.9	U	2.1	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	1.9	U	2.1	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	1.9	U	2.1	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	1.9	U	2.1	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	1.9	U	2.1	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	1.9	U	2.1	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	1.9	U	2.1	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	1.9	U	2.1	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	1.9	U	2.1	U

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		Location	N/A		N/A	
		Sample/Parent ID	FTR-OFFP-FB-101921		FTR-OFFP-FB-102021	
		Sample Date	10/19/2021		10/20/2021	
		Sample Type	FRB		FRB	
Analyte	CAS	Units	Result	Qual	Result	Qual
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	1.9	U	2.1	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	1.9	U	2.1	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	1.9	U	2.1	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	1.9	U	2.1	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	1.9	U	2.1	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	1.9	U	2.1	U

Notes:

1. **Bolded** values indicate the result was detected greater than the limit of detection.

Acronyms/Abbreviations:

CAS = Chemical Abstracts Service number
FD = field duplicate sample
FRB = field reagent blank
FTR = Fort Rucker, Alabama
ID = identification
N = primary sample
N/A = not applicable
ng/L = nanogram per liter
OFFP = off-post
PFAS = per- and polyfluoroalkyl substances

Qualifier Description

J = The analyte was positively identified; however the associated numerical value is an estimated concentration only
U = The analyte was analyzed for but the result was not detected above the limit of quantification (LOQ)
UJ = The compound or analyte was reported as not detected by the laboratory; however, the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

ATTACHMENT 2

Data Usability Summary Report

(Internal Document)