FINAL
Site Inspection Report
Madison Army Aviation Support Facility #2
Madison, Wisconsin

Site Inspection for Perfluorooctanoic Acid (PFOA), Perfluorooctanesulfonic Acid (PFOS), Perfluorohexanesulfonic Acid (PFHxS), Perfluorononanoic Acid (PFNA), Hexafluoropropylene Oxide Dimer Acid (HFPO-DA), and Perfluorobutanesulfonic Acid (PFBS)
ARNG Installations, Nationwide

August 2023

Prepared for:

Army National Guard Headquarters
111 S. George Mason Drive
Arlington, VA 22204

UNCLASSIFIED

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*Photographs were not collected during this field effort.

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LIST OF ACRONYMS AND ABBREVIATIONS

°C	Degrees Celsius
°F	Degrees Fahrenheit
%	Percent
µg/kg	Microgram(s) per kilogram
AASF	Army Aviation Support Facility
AECOM	AECOM Technical Services, Inc.
AFFF	Aqueous Film Forming Foam
amsl	Above mean sea level
ANG	Air National Guard
AOI	Area of Interest
ARNG	Army National Guard
ASTM	American Society for Testing and Materials
bgs	Below ground surface
btoc	Below top of casing
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Chain-of-custody
CSM	Conceptual site model
DA	Department of the Army
DoD	Department of Defense
DOE	Department of Energy
DPT	Direct-push technology
DQI	Data quality indicator
DQO	Data quality objective
DUA	Data usability assessment
EA	EA Engineering, Science, and Technology, Inc., PBC
EB	Equipment Blank
EIS	Extraction internal standards
ELAP	Environmental Laboratory Accreditation Program
EM	Engineer Manual
FB	Field blank
FedEx	Federal Express
ft	Foot (feet)
FTA	Fire Training Area
HDPE	High-density polyethylene
HEF	High expansion foam
HFPO-DA	Hexafluoropropylene oxide dimer acid
HQ	Hazard Quotient

ICAL	initial calibration
IDW	Investigation-derived waste
ITRC	Interstate Technology Regulatory Council
LC/MS/MS	Liquid chromatography tandem mass spectrometry
LCS	Laboratory control sample
LCSD	Laboratory control sample duplicate
LOQ	Limit of quantification
MIL-SPEC	military specification
MS	Matrix spike
MSD	Matrix spike duplicate
NELAP	National Environmental Laboratory Accreditation Program
ng/L	Nanogram(s) per liter
NOAA	National Oceanic and Atmospheric Administration
OSD	Office of the Secretary of Defense
PA	preliminary assessment
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PID	photoionization detector
PVC	polyvinyl chloride
QA	Quality assurance
QAPP	Quality Assurance Project Plan
QC	Quality control
QSM	Quality Systems Manual
RI	Remedial investigation
RPD	Relative percent difference
SI	Site Inspection
SL	Screening level
TOC	Total organic carbon
TPP	Technical Project Planning
UFP	Uniform Federal Policy
USACE	U.S. Army Corps of Engineers

USAF	U.S. Air Force
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
WDNR	Wisconsin Department of Natural Resources
WIANG	Wisconsin Air National Guard
WIARNG	Wisconsin Army National Guard
Wood	Wood Environment & Infrastructure Solutions, Inc.
WSP	WSP USA Environment & Infrastructure, Inc.

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EXECUTIVE SUMMARY

The Army National Guard (ARNG) G-9 is performing Preliminary Assessments (PAs) and Site Inspections (SIs) at ARNG facilities nationwide based on the current or potential historical use of per- and polyfluoroalkyl substances (PFAS) with a focus on the six compounds presented in the memorandum regarding Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense (DoD) Cleanup Program (Assistant Secretary of Defense, 2022) from the Office of the Secretary of Defense (OSD) dated 6 July 2022. The six compounds listed in the OSD memorandum include perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), perfluorobutanesulfonic acid (PFBS), perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PFHxS), and hexafluoropropylene oxide dimer acid (HFPO-DA)[1]. These compounds are collectively referred to as "relevant compounds" throughout the document, and the applicable screening levels (SLs) are provided below in **Table ES-1**.

The PA identified one Area of Interest (AOI) where PFAS-containing materials may have been used, stored, disposed, or released historically (see **Table ES-2** for the AOI location). The objective of the SI is to identify whether there has been a release to the environment from the AOI identified in the PA and determine whether further investigation is warranted, a removal action is required to address immediate threats, or no further action is required based on SLs for the relevant compounds. This SI was completed at the Madison Army Aviation Support Facility (AASF) #2 in Madison, Wisconsin and determined further investigation is warranted for AOI 1. Madison AASF #2 will also be referred to as the "Facility" throughout this document.

Madison AASF #2, operated by Wisconsin ARNG (WIARNG), encompasses approximately 19.81 acres in Madison, Wisconsin. The Facility is split into two different parcels of land. The 14.7-acre parcel where the ramps, hangars, and main AASF building are situated, is owned by Dane County Regional Airport, who leases it to the United States Air Force (USAF) for the term of 1982 to 2050. The USAF permits the parcel of land to the United States Army, who licenses the parcel to the Wisconsin Army National Guard (WIARNG). The term of the permit to the United States Army and license to the WIARNG is from 1988 to 2041. The second parcel of land includes approximately 5.11 acres of land that is leased directly to the WIARNG from Dane County Regional Airport for the term of 2011 to 2045.

The PA identified one AOI for investigation during the SI phase. SI sampling results from the AOI were compared to OSD SLs. **Table ES-2** summarizes the SI results for each AOI. Based on the results of this SI, further evaluation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is warranted in a Remedial Investigation (RI) for AOI 1.

[1] Of the six PFAS compounds presented in the 6 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte at the time of this SI. Based on the conceptual site model (CSM) developed during the PA and revised based on SI findings, the presence of HFPO-DA is not anticipated at the facility because HFPO-DA is generally not a component of military specification (MIL-SPEC) aqueous film forming foam (AFFF) and based on its history including distribution limitations that restricted use of GenX, it is generally not a component of other products the military used. In addition, it is unlikely that GenX would be an individual chemical of concern in the absence of other PFAS.

Table ES-1. Screening Levels (Soil and Groundwater)

Analyte[2]	Residential (Soil) (µg/kg)[1] 0-2 feet bgs	Industrial / Commercial Composite Worker (Soil) (µg/kg)[1] 2-15 feet bgs	Tap Water (Groundwater) (ng/L)[1]
PFOA	19	250	6
PFOS	13	160	4
PFBS	1,900	25,000	601
PFHxS	130	1,600	39
PFNA	19	250	6

Notes:
1. Assistant Secretary of Defense. July 2022. Risk Based Screening Levels in Groundwater and Soil using United States Environmental Protection Agency's (USEPA's) Regional Screening Level Calculator. Hazard Quotient (HQ)=0.1. May 2022.
2. Of the six PFAS compounds presented in the 6 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte at the time of this SI. Based on the CSM developed during the PA and revised based on SI findings, the presence of HFPO-DA is not anticipated at the facility because HFPO-DA is generally not a component of MIL-SPEC AFFF and based on its history including distribution limitations that restricted use of GenX, it is generally not a component of other products the military used. In addition, it is unlikely that GenX would be an individual chemical of concern in the absence of other PFAS.

Abbreviations:
µg/kg = microgram(s) per kilogram
ng/L = nanogram(s) per liter

Table ES-2. Summary of Site Inspection Findings and Recommendations

AOI	Potential Release Area	Soil – Source Area	Groundwater – Source Area	Groundwater – Facility Boundary	Future Action
1	West Ramp	○	●	◐	Proceed to RI

Legend:
● = Detected; exceedance of screening levels
◐ = Detected; no exceedance of screening levels
○ = Not detected

1. INTRODUCTION

1.1 PROJECT AUTHORIZATION

The Army National Guard (ARNG) G-9 is the lead agency in performing Preliminary Assessments (PAs) and Site Inspections (SIs) at ARNG facilities nationwide based on the current or potential historical use of per- and polyfluoroalkyl substances (PFAS) with a focus on the six compounds presented in the memorandum regarding Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense (DoD) Cleanup Program (Assistant Secretary of Defense, 2022) from the Office of the Secretary of Defense (OSD) dated 6 July 2022. The six compounds listed in the OSD memorandum are referred to as "relevant compounds" throughout this document and include perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), perfluorobutanesulfonic acid (PFBS), perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PFHxS), and hexafluoropropylene oxide dimer acid (HFPO-DA)[1]. The ARNG performed this SI at the Madison Army Aviation Support Facility (AASF) #2 in Madison, Wisconsin. The Madison AASF #2 is also referred to as the "Facility" throughout this report.

The SI project elements were performed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (U.S. Environmental Protection Agency [USEPA], 1980), as amended, the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulations Part 300; USEPA, 1994), and in compliance with U.S. Department of Army (DA) requirements and guidance for field investigations.

1.2 SITE INSPECTION PURPOSE

A PA was performed at the Madison AASF #2 (AECOM Technical Services, Inc. [AECOM], 2020) that identified one Area of Interest (AOI) where PFAS-containing materials may have been used, stored, disposed, or released historically. The objective of the SI is to identify whether there has been a release to the environment from the AOI identified in the PA and determine whether further investigation is warranted, a removal action is required to address immediate threats, or no further action is required based on screening levels (SLs) for the relevant compounds.

[1] Of the six PFAS compounds presented in the 6 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte at the time of this SI. Based on the conceptual site model (CSM) developed during the PA and revised based on SI findings, the presence of HFPO-DA is not anticipated at the facility because HFPO-DA is generally not a component of military specification (MIL-SPEC) aqueous film forming foam (AFFF) and based on its history including distribution limitations that restricted use of GenX, it is generally not a component of other products the military used. In addition, it is unlikely that GenX would be an individual chemical of concern in the absence of other PFAS.

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2. FACILITY BACKGROUND

2.1 FACILITY LOCATION AND DESCRIPTION

Madison AASF #2 is located in the southern portion of the Dane County Regional Airport in Madison, Wisconsin. The Facility is on the northeastern city limits of Madison and is adjacent to Lake Mendota and Lake Monona. The City of Madison and communities of Token Creek, Westport, Maple Bluff, and Burke lie within 5 miles of the Facility.

The Facility is split into two different parcels of land. The 14.7-acre parcel where the ramps, hangars, and main AASF building are situated, is owned by Dane County Regional Airport, who leases it to the United States Air Force (USAF) for the term of 1982 to 2050. The USAF permits the parcel of land to the United States Army, who licenses the parcel to the Wisconsin Army National Guard (WIARNG). The term of the permit to the United States Army and license to the WIARNG is from 1988 to 2041. The second parcel of land includes approximately 5.11 acres of land that is leased directly to the WIARNG from Dane County Regional Airport for the term of 2011 to 2045 (**Figure 2-1**) (AECOM, 2020).

2.2 FACILITY ENVIRONMENTAL SETTING

The Facility is in the City of Madison, south-central Wisconsin, near the western margin of the Great Lakes Section of the Central Lowlands Physiographic Province. This section is characterized by numerous lakes with associated lacustrine plains, prominent end moraines, poorly integrated drainage, and a still partially exposed cuestaform topography. There are three lakes within 10 miles of the Facility. Lakes Monona and Waubesa are to the south of the Facility, and Lake Mendota is southwest of the Facility. The Facility is at an elevation of approximately 890 feet above mean sea level. (AECOM, 2020).

The following sections include information on geology, hydrogeology, hydrology, climate, and current and future land use. The topography at the Facility is shown on **Figure 2-2.** The regional geology and groundwater features are shown on **Figure 2-3**. The regional surface water features and drainage basins are shown on **Figure 2-4**. Groundwater elevations and contours are presented on **Figure 2-5**.

2.2.1 Geology

Madison AASF #2 is in the Central Lowlands Physiographic Province, which is characterized by mostly Paleozoic bedrock, with some Cretaceous rocks underlying the western boundary. The underlying glacial deposits in the region are largely horizontal Paleozoic sandstones, shales, limestones, conglomerates, and coals (National Park Service, 2018). The topography of the region is a result of glaciation and is characterized structurally by numerous domes, and uplifts control regional dips. With the exception of the southern border, the entire province is bounded by topography that is higher in elevation (PEER, 1988). The glacial deposits in southern Wisconsin vary in thickness from only a few feet to several hundred feet. The Facility is located directly above a section of glacial drift that is approximately 300 feet thick.

During the SI, low to medium plasticity fines (silts and sands) were observed as the dominant lithology of the unconsolidated sediments below the Madison AASF #2. The borings were completed at depths between 10 and 14.5 feet below ground surface (bgs). Varying quantities of sand were noted, specifically, isolated layers of gravel, clay and clayey silt were also observed in the borings with thicknesses ranging from a few inches to one foot. Samples for grain size analyses were collected at one location, AOI01-03 and analyzed via American Society for Testing and Materials (ASTM) Method D-422. The results indicate that the soil samples are comprised primarily of sand (20% to 86.4%), silt (5.5% to 18%) and clay (5.5%). These results and facility observations are consistent with the reported depositional environment of the region. Boring logs are presented in **Appendix E** and grain size results are presented in **Appendix F**.

2.2.2 Hydrogeology

There are two types of aquifers at Madison AASF #2. The Sandstone and Dolomite Aquifers consist of layers of sandstone and dolomite bedrock that vary greatly in their water-yielding properties. The Dolomite Aquifer has groundwater within the fractures of the rocks, while the Sandstone Aquifer groundwater occurs in pore spaces between loosely cemented sand grains. The sandstone aquifer is further broken down into an Upper Sandstone Aquifer and Lower Sandstone Aquifer. The Upper Sandstone Aquifer is composed of sandstone and dolomite of the Ancell and Prairie du Chien Groups of Ordovician age. This aquifer is not a major source of groundwater in the region due to erosion by other formations. The Lower Sandstone Aquifer is composed of a thick sedimentary sequence of Cambrian sandstone. The aquifer is wedge-shaped, and the water yields increase to the southeast. The Lower Sandstone Aquifer is an important source of water for municipalities and industries due to the ability to yield approximately 1,000 gallons of water per minute. Infiltration from snowmelt and precipitation are the main sources of recharge for the shallow aquifers. The majority of recharge to the aquifers occurs in the winter months, where precipitation and snowmelt are high, and evapotranspiration is low. Groundwater at the Facility has been encountered at depths ranging from 5 to 10 feet bgs. Groundwater flow direction around the Facility is inferred to be generally to the southeast, towards Starkweather Creek (AECOM 2020).

Depth to water measured during the SI activities in March 2022 ranged from 5.69 to 9.34 feet bgs. Groundwater elevation contours from the SI are presented on **Figure 2-5** and indicate the groundwater generally flows towards the center of Facility then towards Starkweather Creek located to the east.

No potable water wells are located within the boundary of the Facility. Drinking water for the Facility is supplied by the City of Madison, which obtains its public water supply from the Lower Sandstone Aquifer. The nearest municipal water supply well is located approximately 1 mile southeast and is downgradient of the Facility. According to the City of Madison (https://www.cityofmadison.com/water/water-quality/water-quality-testing/perfluorinated-compounds), PFAS is present in every Madison supply well at concentrations ranging from 2.5 to 47 nanograms per liter (ng/L), based on the most recent test results. According to Wisconsin Department of Natural Resources' (WDNR) well records, there are multiple wells of unknown use that are located within a 4-mile radius of the Facility.

2.2.3 Hydrology

Madison AASF #2 is in the Starkweather Creek Watershed, which is a 24-square mile basin that encompasses parts of the City of Madison, and the towns of Burke and Blooming Grove. The bodies of water that are in the surrounding regions of the Facility include Lake Mendota to the southwest, Lake Monona and Lake Waubesa to the south, and Starkweather Creek, which surrounds the Facility. Lake Mendota is a 9,781-acre lake located in Dane County and has a maximum depth of 83 feet. Lake Monona is connected to Lake Mendota by the Yahara River, which is located on the southern border of Lake Mendota. Lake Monona is a 3,359-acre lake located in Dane County and has a maximum depth of 74 feet. Both lakes are accessible to recreational users via public beaches and boating activities. Starkweather Creek consists of two branches that total 20 miles in length. The West Branch of the creek originates in Token Creek Country Park, and the East Branch of the creek originates near the city of Sun Prairie. Both branches eventually converge and empty into Lake Monona, located in the Lake Monona-Yahara River Watershed (AECOM 2020).

The Facility has a storm water collection system consisting of a storm sewer system on the northern portion, and man-made ditches with underdrains around the south ramp. The storm water system discharges east into Starkweather Creek, which surrounds the Facility on the west, east and south sides. The Starkweather Creek empties into Lake Monona, which is approximately 2 miles to the south.

2.2.4 Climate

The climate at Madison AASF #2 consists of four clearly separated seasons, with a humid continental climate that is characterized by variable weather patterns. Seasonally, temperatures vary from average summer highs of 83.3 degrees Fahrenheit (°F) to average winter lows of 8.1°F. The mean annual rainfall is 31.0 inches. The average snowfall is 50.9 inches (National Oceanic and Atmospheric Administration [NOAA], 2019).

2.2.5 Current and Future Land Use

The Madison AASF #2 is a controlled access facility with public roads and is adjacent to the Dane County Regional Airport (north-northwest) and the Wisconsin Air National Guard (WIANG) (north-northeast) at Truax Field. Reasonably anticipated future land use is not expected to change from the current land use; however, future infrastructure improvements, land acquisitions, and land use controls at the Dane County Regional Airport and WIANG at Truax Field are unknown.

2.2.6 Sensitive Habitat and Threatened/Endangered Species

A wildlife survey has not occurred at the Facility, and the Facility does not have any significant areas of habitat. The following species have not been identified at the Facility but may be present in the surrounding area.

The following species are listed as federally endangered, threatened, proposed, and/or candidate species in Dane County, Wisconsin (U.S. Fish and Wildlife Services, 2021):

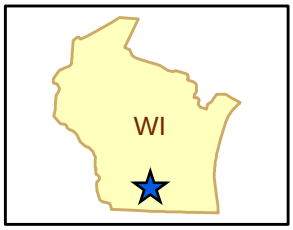
- **Birds:** Whooping Crane, *Grus americana* (Experimental population)
- **Flowering Plants:** Eastern Prairie Fringed Orchid, *Platanthera leucophaea* (Threatened); Mead's milkweed, *Asclepias meadii* (Threatened); Prairie Bush-clover, *Lespedeza leptostachya* (Threatened)
- **Insects:** Monarch Butterfly, *Danaus plexippus* (candidate); Rusty Patched Bumble Bee, *Bombus affinis* (endangered)
- **Mammals:** Northern Long-eared bat, *Myotis septentrionalis* (threatened)

2.3 HISTORY OF PFAS USE

One AOI was identified in the PA where aqueous film-forming foam (AFFF) may have been used, stored, disposed, or released historically at the Madison AASF #2 (AECOM, 2020). AOI 1 historically had several 60-gallon TriMax™ fire extinguishers in various locations on the West Ramp area. It is unknown when the TriMax™ fire extinguishers arrived at the Facility; however, they were present until 2008. There are no records of training, routine maintenance, or annual maintenance. There were no reported leaks or aqueous film forming foam (AFFF) releases from the TriMax™ fire extinguishers, however it is possible that leakages may have occurred (AECOM 2020). A description of the AOI is presented in **Section 3**.

Army National Guard Site Inspections
Site Inspection Report
Madison AASF #2, Wisconsin

Figure 2-1
Facility Location



Facility Data

Facility Boundary

Data Sources:
ESRI 2020

Date:.....October 2022
Prepared By:.....WSP
Prepared For:.....USACE
Projection:.....NAD 83 UTM 16N

K:\NGB Contract\ARNG PFAS SI\Madison AASF\13.0 GIS_SI\Figure 2-1 Facility Location.mxd - stephane.descombes - 10/26/2022 - 12:20:24 PM

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Army National Guard Site Inspections
Site Inspection Report
Madison AASF #2, Wisconsin

Figure 2-2
Facility Topography

Facility Data
- Facility Boundary
- Potential PFAS Release

Stormwater
- Starkweather Creek

Topography
- Elevation Contour (2 ft. interval, NAVD88 datum)

Data Sources:
ESRI 2020

Date:.....October 2022
Prepared By:.....WSP
Prepared For:.....USACE
Projection:.....NAD 83 UTM 16N

K:\NGB Contract\ARNG PFAS SI\Madison AASF\13.0 GIS_SI\Figure 2-2 Facility Topography.mxd - stephane.descombes - 10/26/2022 - 12:18:32 PM

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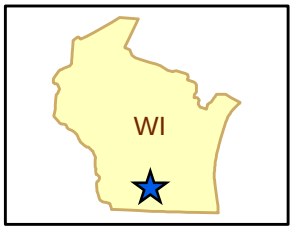
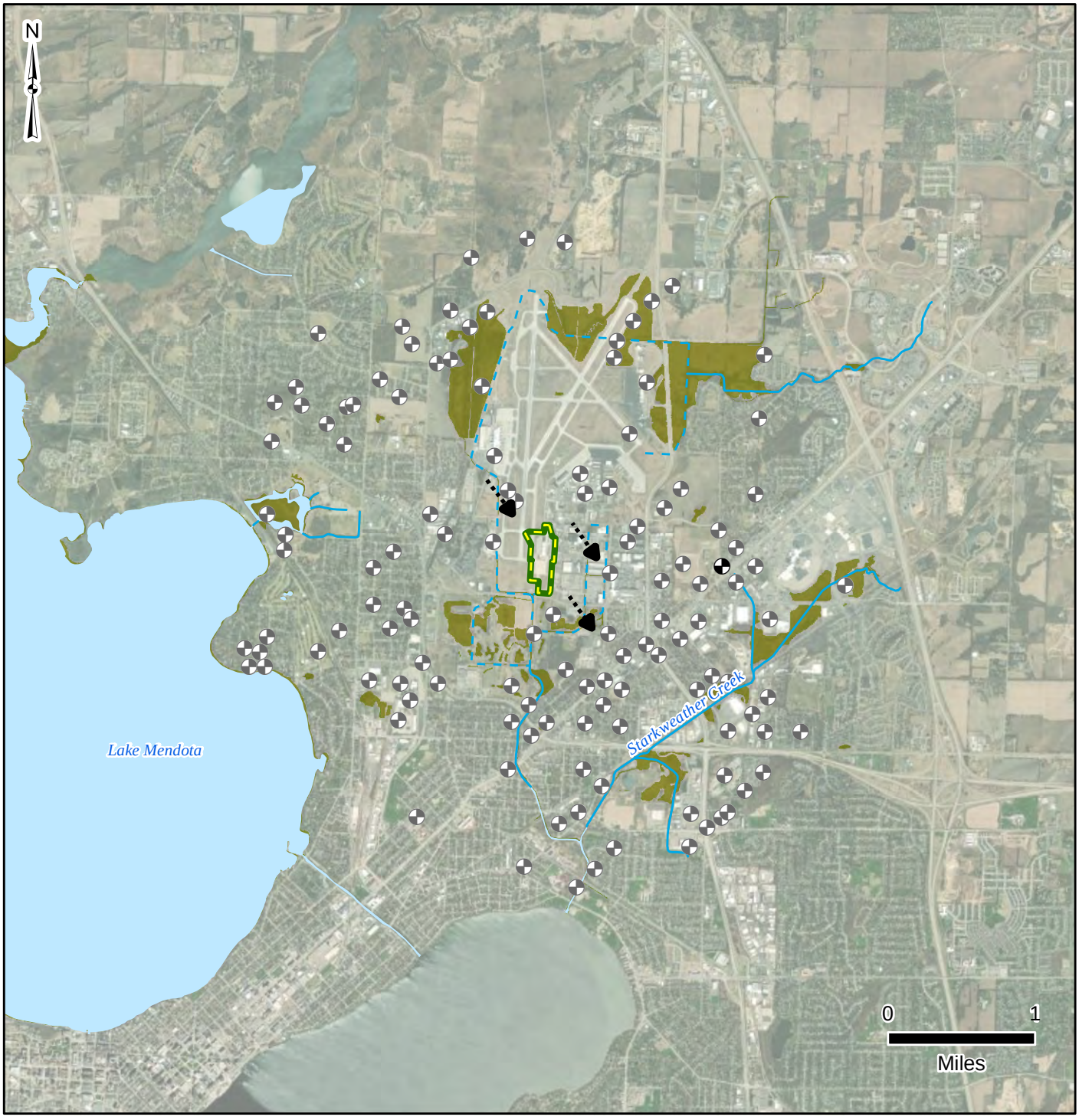
Army National Guard Site Inspections
Site Inspection Report
Madison AASF #2, Wisconsin

Figure 2-3
Groundwater Features





Facility Data

Facility Boundary

Well Type

Municipal Well 15

Unknown*

* Only wells within 2 mile of Facility Boundary shown

Hydrology

River/Stream

Canal/Ditch

Waterbody

Wetland

Hydrogeology

Inferred Shallow Groundwater Flow Direction

Data Sources:
ESRI 2020

Date:.....October 2022
Prepared By:.....WSP
Prepared For:.....USACE
Projection:.....NAD 83 UTM 16N

K:\NGB Contract\ARNG PFAS SI\Madison AASF\13.0 GIS_SI\Figure 2-3 Groundwater Features.mxd - stephane.descombes - 10/26/2022 - 12:24:49 PM

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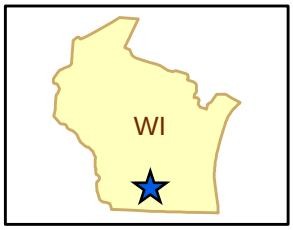
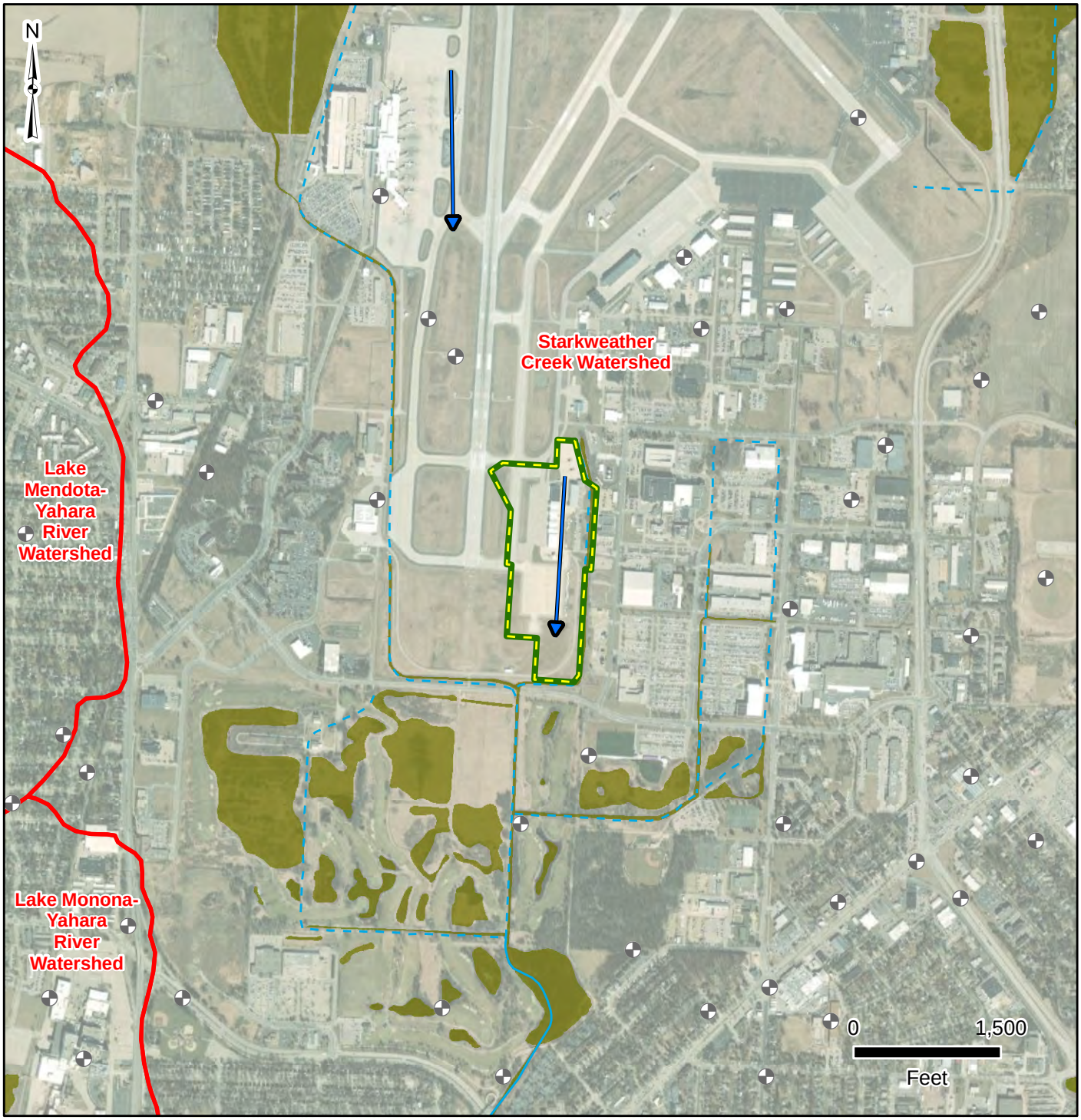
Army National Guard Site Inspections
Site Inspection Report
Madison AASF #2, Wisconsin

Figure 2-4
Surface Water Features





Facility Data
- Facility Boundary

Hydrology
- Surface Water Flow Direction
- River/Stream
- Canal/Ditch
- Wetland
- Watershed Boundary

Well Type
- Unknown

Data Sources:
ESRI 2020

Date:.....October 2022
Prepared By:.....WSP
Prepared For:.....USACE
Projection:.....NAD 83 UTM 16N

K:\NGB Contract\ARNG PFAS SI\Madison AASF\13.0 GIS_SI\Figure 2-4 Surface Water Features.mxd - stephane.descombes - 10/26/2022 - 12:30:10 PM

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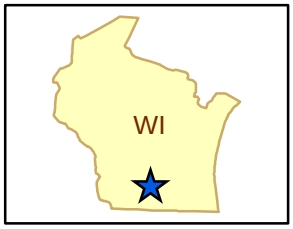
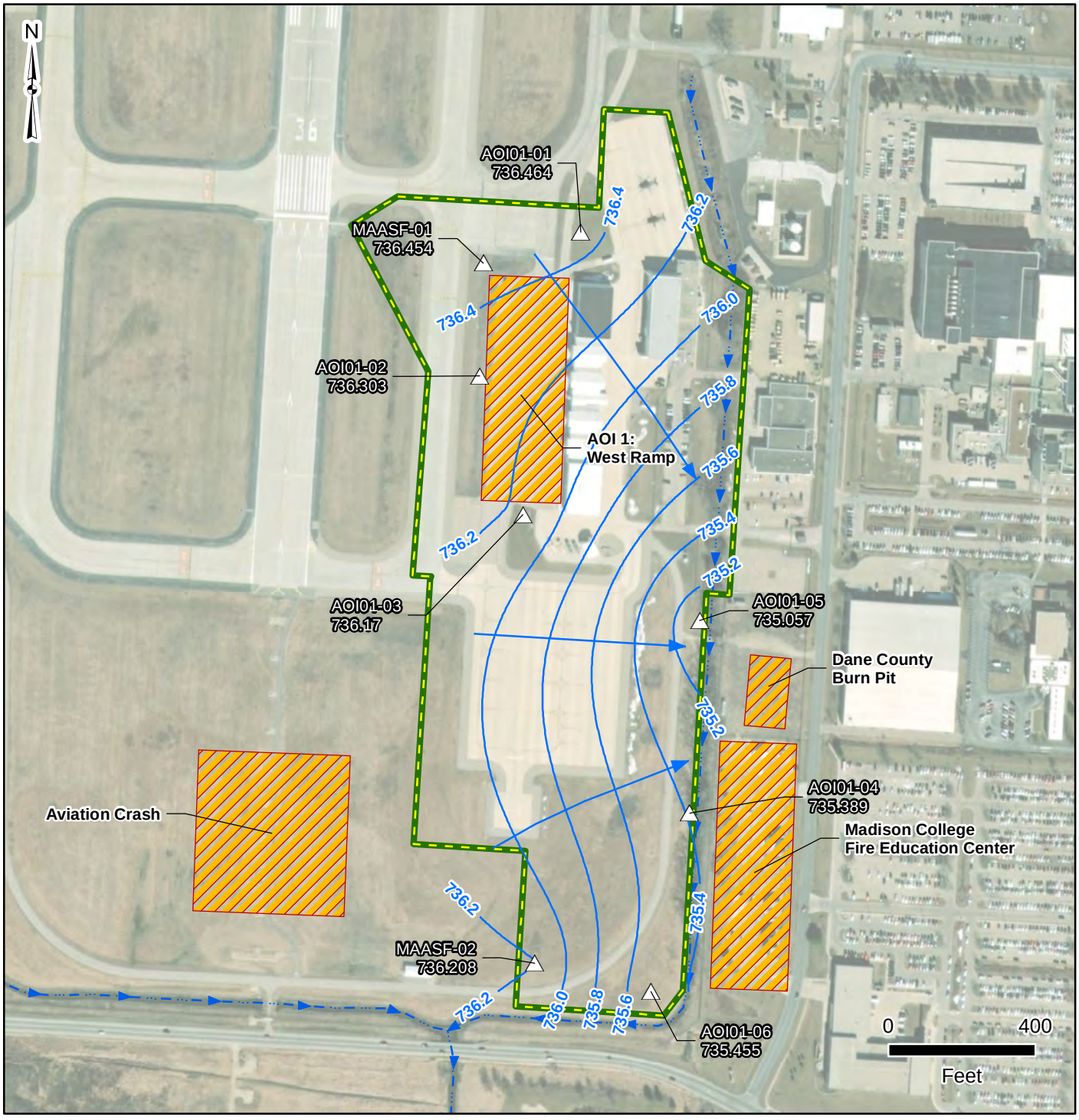
Army National Guard Site Inspections
Site Inspection Report
Madison AASF #2, Wisconsin

Figure 2-5
Groundwater Elevations, March, 2022





Facility Data
- Facility Boundary
- Potential PFAS Release

Sample Location
- Soil Boring & Temporary Groundwater Well Location

Stormwater
- Starkweather Creek

Hydrology
- Groundwater Elevation Contour
- Groundwater Flow Direction

Data Sources:
ESRI 2020

Date:.....October 2022
Prepared By:.....WSP
Prepared For:.....USACE
Projection:.....NAD 83 UTM 16N

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3. SUMMARY OF AREAS OF INTEREST

The PA evaluated areas where PFAS-containing materials may have been used, stored, disposed, or released historically. Based on the PA findings, one potential release area was identified at the Madison AASF #2 and designated as one AOI 1 West Ramp. The AOI is shown on **Figure 3-1**.

3.1 AOI 1 – WEST RAMP

AOI 1 is the fire extinguisher storage on the West Ramp, which historically had several 60-gallon TriMax™ fire extinguishers in various locations. It is unknown when the TriMax™ fire extinguishers arrived at the Facility; however, they were present until 2008. There are no records of training, routine maintenance, or annual maintenance. There were no reported leaks or AFFF releases from the TriMax™ fire extinguishers, however it is possible that leakages may have occurred.

3.2 ADJACENT SOURCES

Eight off-facility potential sources of PFAS were identified adjacent to the Madison AASF #2 and are not associated with WIARNG activities or under the control of the WIARNG. The potential adjacent sources are shown on **Figure 3-1** and described in the following sections for information purposes only.

3.2.1 Wisconsin Air National Guard Property

There are potential PFAS sources adjacent to Madison AASF #2 that may impact PFAS concentrations in groundwater underlying the Facility.

- Hangar 406: The former fire suppression system was supplied with AFFF until 2006 when it was then retrofitted for use of High Expansion Foam (HEF). There were no documented releases, however any release would have been routed to the trench drains, from which is then discharged to the sanitary sewer system.
- Hangar 400: The former fire suppression system was supplied with AFFF until 2009 when it was then retrofitted for use of HEF. Fire suppression system testing occurred at an unknown frequency; however, any release would have been routed to the trench drains, from which it is then discharged to an oil/water separator and ultimately to the sanitary sewer system.
- Former Building 403: Prior to relocation to Building 430, the Truax Fire Department was stationed in Building 403. AFFF was in use and stored at Building 403 from 1988 until it was demolished in 1995/1996. There is no record of AFFF nozzle testing from this time period.
- Fuel Spill Ditch: In 1981, approximately 2,000 gallons of jet fuel were spilled due to an overflow. In response to the spill, the Truax Fire Department foamed the fuel and flushed it down the ditch, where it soaked into the ground and was covered with straw. One month after the spill, the affected soil in the ditch was removed to a depth of 6 feet. The type of foam used to cover the fuel is unknown.

- Building 503 Parking Lot: The soil that was excavated from the Fuel Spill Ditch was relocated to what is now the parking lot west of Building 503. The contaminated soil was placed on concrete pads and spread out to elicit volatilization. The area was then excavated to 3 feet, and all of the soil and concrete was disposed of off-site. The parking lot was paved the same year.
- Hangar 414: Hangar 414 has had an AFFF fire suppression system since 1994. Annual testing of the hangar fire suppression system has been conducted since 1994 and included discharging foam every other year. No other AFFF releases were documented. The hangar is outfitted with trench drains that discharge to a sanitary sewer system.
- Nozzle Test Area 1 and Area 2: The Truax Fire Department vehicles require nozzle testing every 6 months. The tests were conducted in the grassy areas on the northwest and southwest sides of Building 430. After the foam was released, the grassy area was typically watered down, and the foam was allowed to soak into the grass.
- Building 430: Building 430 has been the location of the Truax Fire Station since 1995 and is where the fire department keeps the firetrucks and bulk storage of AFFF. AFFF is transferred to vehicles within the fire station via overhead fill. Additionally, Truax Fire Department vehicles are washed within the fire station or at the outside truck bays when necessary. There are trench drains both in the fire station and downgradient of the truck bays; therefore, any AFFF releases due to vehicle washing would be captured by the trench drains, which discharge into the sanitary sewer system.

This Truax Field Air National Guard Base site is moving to a Remedial Investigation. Although these locations are noted as being side-gradient, based on the proximity of these locations to WIARNG property as well as fluctuation in groundwater flow direction, there is the potential for AFFF releases from WIANG property to impact the Facility. Surface water flow is directed by a man-made surface drainage system that connects to Starkweather Creek and generally discharges to the south towards Lake Monona (BB&E, 2015).

3.2.2 Aviation Crash

A small aviation plane crash occurred at the south end of the air strip, just north of Anderson Street. The exact type of aircraft, date, and owner information of the aviation crash are unknown. The approximate geographic coordinates are 43°7'20.91"N; 89°20'31.91"W. The WIANG responded to the crash, and it is unknown if AFFF was dispensed at the crash site by the WIANG. This property is side-gradient (south-southwest) of the Facility. Although this location is noted as being side-gradient, based on the proximity of this location to WIARNG property as well as fluctuation in groundwater flow direction, there is the potential for this property to impact the Facility if AFFF was used to respond to the crash (AECOM, August 2020).

3.2.3 Dane County Former Fire Training Area (FTA) and Burn Pit

Based on WIANG PFAS investigations, the Dane County former FTA and Burn Pit were identified as potential AFFF release sources due to reported accounts of firefighting training activities potentially using perfluoroalkoxyl foams. The geographic coordinates for the Dane County former FTA are 43°7’44.83”N; 89°20’50.56”W. The Burn Pit associated with this location is located at 43° 7’25.39”N; 89°20’13.70”W. This property is upgradient (north-

northwest) of the Facility, and there is the potential for AFFF releases from this property to impact the Facility (AECOM, August 2020). This potential source area is located upgradient of AOI 1.

3.2.4 Madison College Fire Education Center and Dane County Burn Pit

The Madison College Fire Education Center is a public technical college which teaches several different types of firefighting courses for firefighter certifications. There is no information regarding the types of firefighting training that occurs; however, based on the nature of the activities that take place at the Madison College Fire Education Center, there is a possibility of the use of AFFF.

The Dane County burn pit is adjacent to the Madison College Fire Education Center, where several firefighting courses are taught. The type and volume of PFAS foams that were used is unknown. These locations are considered hydraulically downgradient (east of the Facility), and they are unlikely to impact the Facility (AECOM, August 2020).

3.2.5 Findorff Demo Landfill

The Findorff Demo landfill is currently an inactive landfill and is a closed facility. It is located hydraulically upgradient (northwest) of the Facility.

3.2.6 Maple Bluff Landfill

The Maple Bluff Village landfill is an inactive landfill that is no longer a facility. It is located hydraulically upgradient (northwest) of the Facility.

3.2.7 Dane County Truax Landfill

The Dane County Truax landfill is currently closed while being actively monitored. It is located hydraulically side-gradient and downgradient (south-southwest) of the Facility.

3.2.8 Doc West Hog Farm Landfill

The Doc West Hog Farm landfill is an inactive landfill and is a closed facility. It is located hydraulically side-gradient and downgradient (south-southwest) of the Facility.

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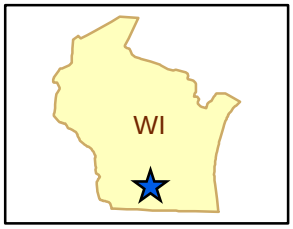
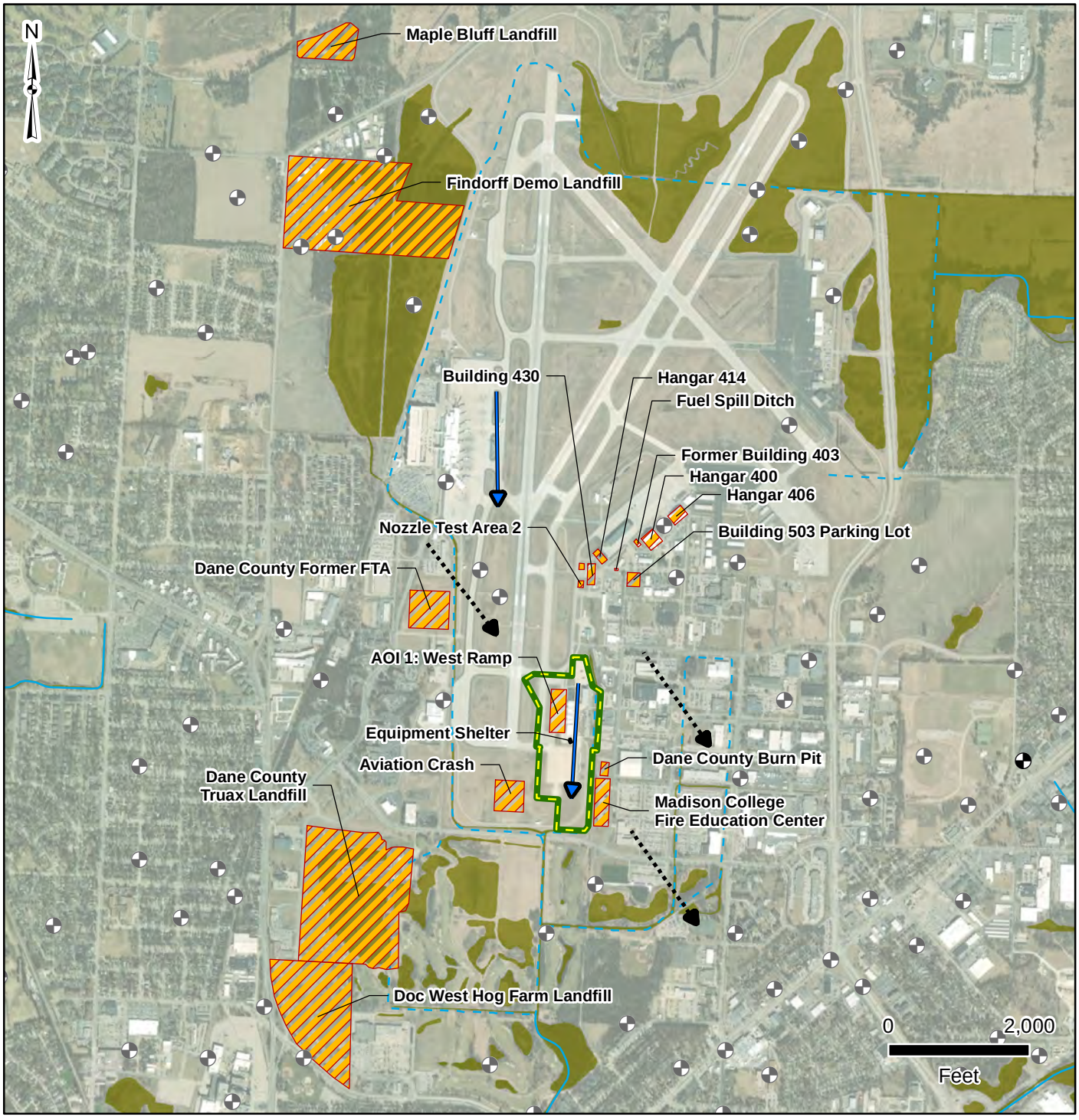
Army National Guard Site Inspections
Site Inspection Report
Madison AASF #2, Wisconsin

Figure 3-1
Areas of Interest





Facility Data

- Facility Boundary
- Potential PFAS Release
- No Suspected Release

Hydrology

- Surface Water Flow Direction
- Inferred Shallow Groundwater Flow Direction
- River/Stream
- Canal/Ditch
- Wetland

Well Type

- Municipal Well 15
- Unknown

Data Sources:
ESRI 2020

Date:.....October 2022
Prepared By:.....WSP
Prepared For:.....USACE
Projection:.....NAD 83 UTM 16N

K:\NGB Contract\ARNG PFAS SI\Madison AASF\13.0 GIS_SI\Figure 3-1 Areas of Interest.mxd - stephane.descombes - 12/5/2022 - 10:37:24 AM

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4. PROJECT DATA QUALITY OBJECTIVES

As identified during the Data Quality Objective (DQO) process and outlined in the SI Uniform Federal Policy (UFP)-Quality Assurance Project Plan (QAPP) Addendum (EA Engineering, Science, and Technology, Inc., PBC/Wood Environment & Infrastructure Solutions, Inc. [EA/Wood], 2022), the objective of the SI is to identify whether there has been a release to the environment at the AOI identified in the PA. For each AOI, ARNG determines if further investigation is warranted, a removal action is required to address immediate threats, or whether no further action is warranted. This SI evaluated groundwater and soil for the presence or absence of relevant compounds at the AOI.

4.1 PROBLEM STATEMENT

ARNG will recommend an AOI for remedial investigation (RI) if related soil and groundwater samples have concentrations of the relevant compounds above the OSD risk-based SLs. The SLs are presented in **Section 6.1** of this report.

4.2 INFORMATION INPUTS

Primary information inputs for the SI include the following:

- The PA Report for Madison AASF #2 (AECOM, 2019);
- Analytical data from groundwater and soil samples collected as part of this SI in accordance with the site-specific UFP-QAPP Addendum (EA/Wood, 2022); and
- Field data collected during the SI, including groundwater elevation and water quality parameters measured at the time of sampling.

4.3 STUDY BOUNDARIES

The scope of the SI was bounded horizontally by the property limits of the Facility (**Figures 2-1** and **2-2**). Off-facility sampling was not included in the scope of this SI. If future off-facility sampling is required, the proper stakeholders will be notified, and necessary rights of entry will be obtained by ARNG with property owner(s). The scope of the SI was bounded vertically by the depth of temporary monitoring wells installed within groundwater (maximum depth of 14.5 feet bgs). Temporal boundaries were limited to the earliest available time field resources were available to complete the study.

4.4 ANALYTICAL APPROACH

Samples were analyzed by Eurofins, accredited under the DoD Environmental Laboratory Accreditation Program (DoD ELAP; Accreditation Number 1.01) and the National Environmental Laboratory Accreditation Program (NELAP; Certificate Number 021). Data were compared to applicable SLs within this document and decision rules as defined in the UFP-QAPP Addendum (EA/Wood, 2022).

4.5 DATA USABILITY ASSESSMENT

The Data Usability Assessment (DUA), which is provided in **Appendix A**, is an evaluation at the conclusion of data collection activities that uses the results of both data verification and validation in the context of the overall project decisions or objectives. Using both quantitative and qualitative methods, the assessment determines whether project execution and the resulting data have met installation specific DQOs. Both sampling and analytical activities are considered to assess whether the collected data are of the right type, quality, and quantity to support the decision-making (DoD, 2019a; DoD, 2019b; USEPA, 2017).

Based on the DUA, the environmental data collected during the SI were found to be acceptable and usable for this SI evaluation with the qualifications documented in the DUA and its associated data validation reports. These data are of sufficient quality to meet the objectives and requirements of the UFP-QAPP (EA, 2020).

5. SITE INSPECTION ACTIVITIES

This section describes the environmental investigation and sampling activities that occurred as part of the SI. The SI sampling approach was based on the findings of the PA and was implemented in accordance with the following approved documents.

- *Final Preliminary Assessment Report, Madison Army Aviation Support Facility #2, Wisconsin* (AECOM, 2020);
- *Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan, Site Inspections for Per- and Polyfluoroalkyl Substances Impacted Sites, ARNG Installations, Nationwide*, dated December *2020* (EA, 2020a);
- *Final Site Inspection Uniform Federal Policy-Quality Assurance Project Plan Addendum, Madison Army Aviation Support Facility #2, Madison, Wisconsin* (EA/Wood, 2022);
- *Final Programmatic Accident Prevention Plan, Revision 1*, dated November 2020 (EA, 2020b);
- *Final Site Safety and Health Plan, Madison Army Aviation Facility #2, Madison, Wisconsin,* dated December 2021 (EA/Wood, 2021).

The SI field activities were conducted from 8 March to 9 March 2022 and consisted of utility clearance, direct-push technology (DPT), boring and soil sample collection, temporary monitoring well installation, grab groundwater sample collection, and land sreplurveying. Field activities were conducted in accordance with the UFP-QAPP Addendum (EA/Wood, 2022), except as noted in **Section 5.8**.

The following samples were collected during the SI and analyzed for 24 compounds via liquid chromatography/tandem mass spectrometry (LC/MS/MS) compliant with Quality Systems Manual (QSM) Version 5.3 Table B-15 to fulfill the project DQOs:

- Twenty-four (24) soil samples from eight boring locations;
- Eight (8) grab groundwater samples from eight temporary well locations;
- Six (6) quality assurance (QA)/quality control (QC) samples.

Figure 5-1 provides the sample locations for all media across the Facility. **Table 5-1** presents the list of samples collected for each medium. Field documentation is provided in **Appendix B**. A log of Daily Notice of Field Activity was completed throughout the SI field activities, which is provided in **Appendix B1**. Sampling forms are provided in **Appendix B2**, and land survey data are provided in **Appendix B3.** Photographs were not collected during this field effort.

5.1 PRE-INVESTIGATION ACTIVITIES

In preparation for the SI field activities, project team members participated in Technical Project Planning (TPP) meetings, performed utility clearance, and sampled decontamination source water. Details of these activities are presented below.

5.1.1 Technical Project Planning

The US Army Corps of Engineers (USACE) TPP Process, Engineer Manual (EM) 200-1-2 (DA, 2016a) defines four phases to project planning: (1) defining the project phase; (2) determining data needs; (3) developing data collection strategies; and (4) finalizing the data collection plan. The process encourages stakeholder involvement in the SI, beginning with defining overall project objectives, including DQOs, and formulating a sampling approach to address the AOI identified in the PA.

A combined TPP Meeting 1 and 2 was held on 30 November 2021, prior to SI field activities. The combined TPP Meeting 1 and 2 was conducted in general accordance with EM 200-1-2. The stakeholders for this SI included ARNG, WIARNG, WDNR, Dane County Airport Authority, USACE, and representatives familiar with the Facility, the regulators, and the community. Stakeholders were provided the opportunity to make comments on the technical sampling approach and methods at the combined TPP Meeting 1 and 2. The outcome of the combined TPP Meeting 1 and 2 was memorialized in the UFP-QAPP Addendum (EA/Wood, 2022).

A TPP Meeting 3 was held to discuss the results of the SI. Meeting minutes for TPP 3 are included in **Appendix D** of this report. Future TPP meetings will provide an opportunity to discuss results and findings, and future actions, where warranted.

5.1.2 Utility Clearance

WSP USA Environment & Infrastructure, Inc. (WSP), formerly doing business as Wood Environment & Infrastructure Solutions, Inc. (Wood), contacted the Wisconsin One Call on 28 February 2021 to notify them of intrusive work at the Facility beginning on 7 March 2022. WSP contracted GLS Utility, a private utility location service, to perform utility clearance at the Facility. Utility clearance was performed at each of the proposed boring locations on 8 March 2022 with input from the WSP field team. Additionally, the first 5 feet of each boring were pre-cleared by WSP's drilling subcontractor, Onsite Environmental, using a hand auger to verify utility clearance in the shallow subsurface where utilities would typically be encountered.

5.1.3 Source Water and PFAS Sampling Equipment Acceptability

The potable water source used for decontamination of drilling equipment was confirmed to meet acceptability criteria, as defined in the UFP-QAPP Addendum, prior to the start of field activities. A sample from a potable water source at inside the main building, was collected on 16 December 2021, prior to mobilization, and analyzed for PFAS by LC/MS/MS compliant with QSM 5.3 Table B-15 (DoD, 2020). The results of the sample of the potable water source used for decontamination of drilling equipment during the SI are provided in **Appendix F**. A discussion of the results is presented in the DUA (**Appendix A**).

Materials that were used within the sampling zone were confirmed as acceptable for use in the PFAS sampling environment. The checklist of acceptable materials for use in the PFAS sampling environment was provided in the Standard Operating Procedures appendix to the Programmatic UFP-QAPP (EA, 2020a).

5.2 SOIL BORINGS AND SOIL SAMPLING

Soil samples were collected via DPT drilling methods in accordance with Standard Operating Procedure 047 *Direct-Push Technology Sampling* (EA, 2021a*).* A GeoProbe® 7822DT dual-tube sampling system was used to collect continuous soil cores to the target depth. A hand auger was used to collect soil from the top 5 feet (ft) of the boring in compliance with utility clearance procedures. The soil boring locations are shown on **Figure 5-1**, and boring sample depths are provided in **Table 5-1**. Several boring locations were adjusted within a 50-feet offset for reasons including drill rig access, utility avoidance and bias toward sampling within observed drainage features.

Three discrete soil samples were collected for chemical analysis from each soil boring: one sample at the surface (0 to 2 ft bgs) and two subsurface soil samples. One subsurface soil sample was collected approximately 1 ft above the groundwater table, and one collected at the mid-point between the surface and the groundwater table (not to exceed 15 ft bgs). Groundwater was encountered at depths ranging from 5 to 10 ft bgs during drilling. Total boring completion depths, to accommodate temporary well installation, ranged from 10 to 14.5 ft bgs.

During the drilling, the soil cores were continuously logged for lithological descriptions by a field geologist using the Unified Soil Classification System. A photoionization detector (PID) was used to screen the breathing zone during boring activities as a part of personal safety requirements. Observations and measurements were recorded on sampling forms (**Appendix B2**) and in a non-treated field logbook. Depth interval, recovery thickness, PID concentrations, moisture, relative density, Munsell color, and Unified Soil Classification System texture were recorded. The boring logs are provided in **Appendix E**.

Each sample was collected into a laboratory-supplied PFAS-free high-density polyethylene (HDPE) bottle and labeled using a PFAS-free marker or pen. Samples were packaged on ice and transported via Federal Express (FedEx) under standard Chain-of-custody (COC) procedures to the laboratory and analyzed for PFAS (LC/MS/MS compliant with QSM Version 5.3 Table B-15), total organic carbon (TOC, USEPA Method 9060A), pH (USEPA Method 9045D), and grain size (ASTM Method D-422) in accordance with the UFP-QAPP Addendum (EA/Wood, 2022).

Field duplicate samples were collected at a rate of 10% and analyzed for the same parameters as the accompanying samples. Matrix spike (MS)/matrix spike duplicates (MSDs) were collected at a rate of 5% and analyzed for the same parameters as the accompanying samples. In instances when non-dedicated sampling equipment was used, one equipment blank (EB) was collected per day and analyzed for the same parameters as the soil samples. A temperature blank was placed in each cooler for use in confirming that samples were preserved at or below 6 degrees Celsius (°C) during shipment.

DPT borings were converted to temporary wells, which were subsequently abandoned after sampling and surveying in accordance with the UFP-QAPP Addendum (EA/Wood, 2022). After removal of the casings, boreholes were abandoned using bentonite chips. Borings were installed in grass areas to avoid disturbing concrete or asphalt surfaces.

5.3 TEMPORARY WELL INSTALLATION AND GROUNDWATER GRAB SAMPLING

Temporary wells were installed using a GeoProbe® 7822DT dual-tube sampling system. Once the borehole was advanced to the desired depth, a temporary well was constructed of a 5-ft section of 1-inch Schedule 40 polyvinyl chloride (PVC) screen with sufficient casing to reach the ground surface. New PVC pipe and screen were used at each location to avoid cross contamination between locations. The screen intervals for the temporary wells are provided in **Table 5-2**.

Groundwater samples were collected after a period of time following well installation to allow groundwater to infiltrate and recharge the temporary well intervals. After the recharge period, groundwater samples were collected using a peristaltic pump with PFAS-free HDPE tubing. The temporary wells were purged at a rate determined in the field to reduce turbidity and draw down prior to sampling. Water quality parameters (e.g., temperature, specific conductance, pH, dissolved oxygen, and oxidation-reduction potential) were measured using a water quality meter and recorded on the field sampling form (**Appendix B2**) before each grab sample was collected in a separate container. Additionally, a subsample of each groundwater sample was collected in a separate container, and a shaker test was completed to identify if there were any foaming. No foaming was noted in any of the groundwater samples.

Each sample was collected in laboratory-supplied PFAS-free HDPE bottles and labeled using a PFAS-free marker or pen. Samples were packaged on ice and transported via FedEx under standard COC procedures to the laboratory and analyzed for PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 in accordance with the UFP-QAPP Addendum (EA/Wood, 2022).

Field duplicate samples were collected at a rate of 10% and analyzed for the same parameters as the accompanying samples. MS/MSDs were collected at a rate of 5% and analyzed for the same parameters as the accompanying samples. One field blank (FB) was collected in accordance with the UFP-QAPP Addendum (EA, 2021a). In instances when non-dedicated sampling equipment was used, such as a water level meter, one EB was collected a day and analyzed for the same parameters as the groundwater samples. A temperature blank was placed in each cooler for use in confirming that samples were preserved at or below 6°C during shipment.

Following well surveying (described below in **Section 5.5**), temporary wells were abandoned in accordance with the SI UFP-QAPP Addendum (EA/Wood, 2022) by removing the PVC and backfilling the hole with bentonite chips.

5.4 SYNOPTIC WATER LEVEL MEASUREMENTS

A synoptic groundwater gauging event was performed on 9 March 2022. Groundwater elevation measurements were collected from the eight new temporary monitoring wells. Water level measurements were taken from the survey mark on the northern side of the well casing. Groundwater elevation data is provided in **Table 5-3**. A groundwater flow contour map is provided as **Figure 2-4**. The synoptic water level measurement indicate groundwater generally flows towards the center of the Facility, then is directed towards the west.

5.5 SURVEYING

The northern side of each new temporary well casing was surveyed using a Trimble Receiver R10 GNSS with TSC7. Positions were collected in the applicable Universal Transverse Mercator zone projection with World Geodetic System 1984 datum (horizontal) and North American Vertical Datum 1988 (vertical). Surveying data were collected on 9 March 2022 and are provided in **Appendix B3**.

5.6 INVESTIGATION-DERIVED WASTE

As of the date of this report, the disposal of PFAS investigation-derived waste (IDW) is not regulated federally. IDW generated during the SI is considered non-hazardous waste and was managed in accordance with the UFP-QAPP Addendum (EA/Wood, 2022).

Soil IDW (i.e., soil cuttings) generated during the SI activities were contained in labeled, 55-gallon steel drums and left onsite in a designated waste storage area. The soil IDW was not sampled and assumes the characteristics of the associated soil samples collected from that source location.

Liquid IDW generated during SI activities (i.e., purge water, development water, and decontamination fluids) were contained in labeled, 55-gallon steel drums and left onsite in a designated waste storage area. The liquid IDW was not sampled and assumes the characteristics of the associated groundwater samples collected from that source location.

The solid and liquid IDW were taken offsite in September 2022 and disposed of in a Resource Conservation and Recovery Act Subtitle C landfill. Specifics on the disposal of solid and liquid IDW are included in a separate report provided to ARNG.

Other solids such as spent personal protective equipment, plastic sheeting, tubing, rope, unused monitoring well construction materials, and other environmental media generated during the field activities were disposed of at a licensed solid waste landfill.

5.7 LABORATORY ANALYTICAL METHODS

Samples were analyzed by LC/MS/MS, compliant with QSM Version 5.3 Table B-15, at Eurofins in Lancaster, Pennsylvania, a DoD ELAP and NELAP-certified laboratory.

Soil samples were also analyzed for TOC using USEPA Method 9060A, pH by USEPA Method 9045D, and grain size using ASTM Method D-422.

5.8 Deviations from SI UFP-QAPP Addendum

Deviations from the UFP-QAPP Addendum occurred and were discussed between EA/Wood, ARNG, and USACE. Two deviations from the UFP-QAPP Addendum are noted below that were not documented on a Field Change Request Form.

- Photographs taken during the SI were inadvertently deleted prior to download; therefore, no photographic log is presented in Appendix C.
- No equipment blank sample was collected from the hand auger.

Table 5-1. Site Inspection Samples by Medium
Madison AASF#2, Madison, Wisconsin
Site Inspection Report

Sample Identification	Sample Collection Date	Sample Depth (ft bgs)	PFAS (LC/MS/MS compliant with QSM 5.3 Table B-15)	TOC (USEPA Method 9060A)	pH (USEPA Method 9045D)	Grain Size (ASTM D422)	Comments
Soil Samples							
AOI01-01-SB-0-2	3/8/2022	0-2	X				Parent Sample of Dup-01
DUP-01	3/8/2022	0-2	X				Field Duplicate
AOI01-01-SB-4-5	3/8/2022	4-5	X				
AOI01-01-SB-8-9	3/8/2022	8-9	X				
AOI01-02-SB-0-2	3/8/2022	0-2	X				
AOI01-02-SB-2-3	3/8/2022	2-3	X				
AOI01-02-SB-4-5	3/8/2022	4-5	X				
AOI01-03-SB-0-2	3/8/2022	0-2	X	X	X	X	
AOI01-03-SB-3-4	3/8/2022	3-4	X				
AOI01-03-SB-6-7	3/8/2022	6-7	X				
AOI01-SB-DUP03	3/8/2022		X				
AOI01-04-SB-0-2	3/8/2022	0-2	X				
AOI01-04-SB-3-4	3/8/2022	3-4	X				
AOI01-04-SB-6-7	3/8/2022	6-7	X				
AOI01-05-SB-0-2	3/8/2022	0-2	X				Parent Sample of Dup-02
DUP-02	3/8/2022	0-2	X				Field Duplicate
AOI01-05-SB-3-4	3/8/2022	3-4	X				
AOI01-05-SB-6-7	3/8/2022	6-7	X				
AOI01-06-SB-0-2	3/8/2022	0-2	X				MS/MSD Collected
AOI01-06-SB-3-4	3/8/2022	3-4	X				
AOI01-06-SB-6-7	3/8/2022	6-7	X				
MAASF-01-SB-0-2	3/8/2022	0-2	X				
MAASF-01-SB-2-3	3/8/2022	2-3	X				
MAASF-01-SB-4-5	3/8/2022	4-5	X				
MAASF-01-SB-0-2	3/8/2022	0-2	X				Parent Sample of Dup-03
DUP-03	3/8/2022	0-2	X				Field Duplicate
MAASF-01-SB-5-6	3/8/2022	5-6	X				
MAASF-01-SB-8-9	3/8/2022	8-9	X				
Groundwater Samples							
AOI01-01-GW	3/8/2022		X				Parent Sample of DUP-01-GW
AOI01-02-GW	3/9/2022		X				
AOI01-03-GW	3/9/2022		X				
AOI01-04-GW	3/8/2022		X				
AOI01-05-GW	3/8/2022		X				MS/MSD Collected
AOI01-06-GW	3/8/2022		X				

Sample Identification	Sample Collection Date	Sample Depth (ft bgs)	PFAS (LC/MS/MS compliant with QSM 5.3 Table B-15)	TOC (USEPA Method 9060A)	pH (USEPA Method 9045D)	Grain Size (ASTM D422)	Comments
DUP-01-GW	3/8/2022		X				Field Duplicate
MAASF-01-GW	3/9/2022		X				
MAASF-02-GW	3/9/2022		X				
Blank Samples							
MAASF-FB-01	3/9/2022		X				Field Blank
MAASF-EB-01-WL	3/9/2022		X				Equipment Blank Collected from Water Level Meter

Notes:
AASF = Army Aviation Support Facility
ASTM = American Society for Testing and Materials
bgs = below ground surface
EB = equipment blank
FB = field blank
ft = feet
MS/MSD = matrix spike/ matrix spike duplicate
QSM = Quality Systems Manual
TOC = total organic carbon
USEPA = United States Environmental Protection Agency

Table 5-2. Soil Boring Depths and Temporary Well Screen Intervals
Madison AASF#2, Madison, Wisconsin
Site Inspection Report

AOI	Boring Location	Soil Boring Depth (ft bgs)	Temporary Well Screen Interval (ft bgs) [1]
1	AOI01-01	14	9-14
	AOI01-02	10	5-10
	AOI01-03	12	7-12
	AOI01-04	12	7-12
	AOI01-05	12	7-12
	AOI01-06	13	8-13
	MAASF-01	11	6-11
	MAASF-02	14.5	9.5-14.5

Notes:
[1] Temporary well screen set above total depth to capture groundwater interface
AASF = Army Aviation Support Facility
bgs = below ground surface
ft = feet

Table 5-3. Groundwater Elevation
Madison AASF#2, Madison, Wisconsin
Site Inspection Report

Monitoring Well ID	Top of Casing Elevation (ft NAVD88)	Ground Surface Elevation (ft NAVD 88)	Depth to Water (ft btoc)	Depth to Water (ft bgs)	Groundwater Elevation (ft NAVD 88)
AOI01-01-GW	743.994	742.881	7.53	6.42	736.46
AOI01-02-GW	741.903	741.257	5.69	5.04	736.30
AOI01-03-GW	745.51	744.969	9.34	8.80	736.17
AOI01-04-GW	741.289	739.344	5.90	3.96	735.39
AOI01-05-GW	741.807	741.287	6.75	6.23	735.06
AOI01-06-GW	744.745	742.325	9.29	6.87	735.46
MAASF-01-GW	743.344	742.773	6.89	6.32	736.45
MAASF-02-GW	742.368	741.557	6.16	5.35	736.21

Notes:
[1] Temporary well screen set above total depth to capture groundwater interface
AASF = Army Aviation Support Facility
bgs = below ground surface
btoc = below top of casing
ft = feet
NAVD88 = North American Vertical Datum 1988

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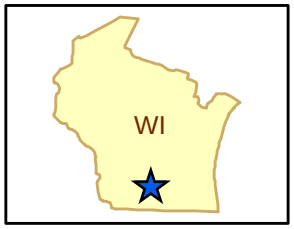
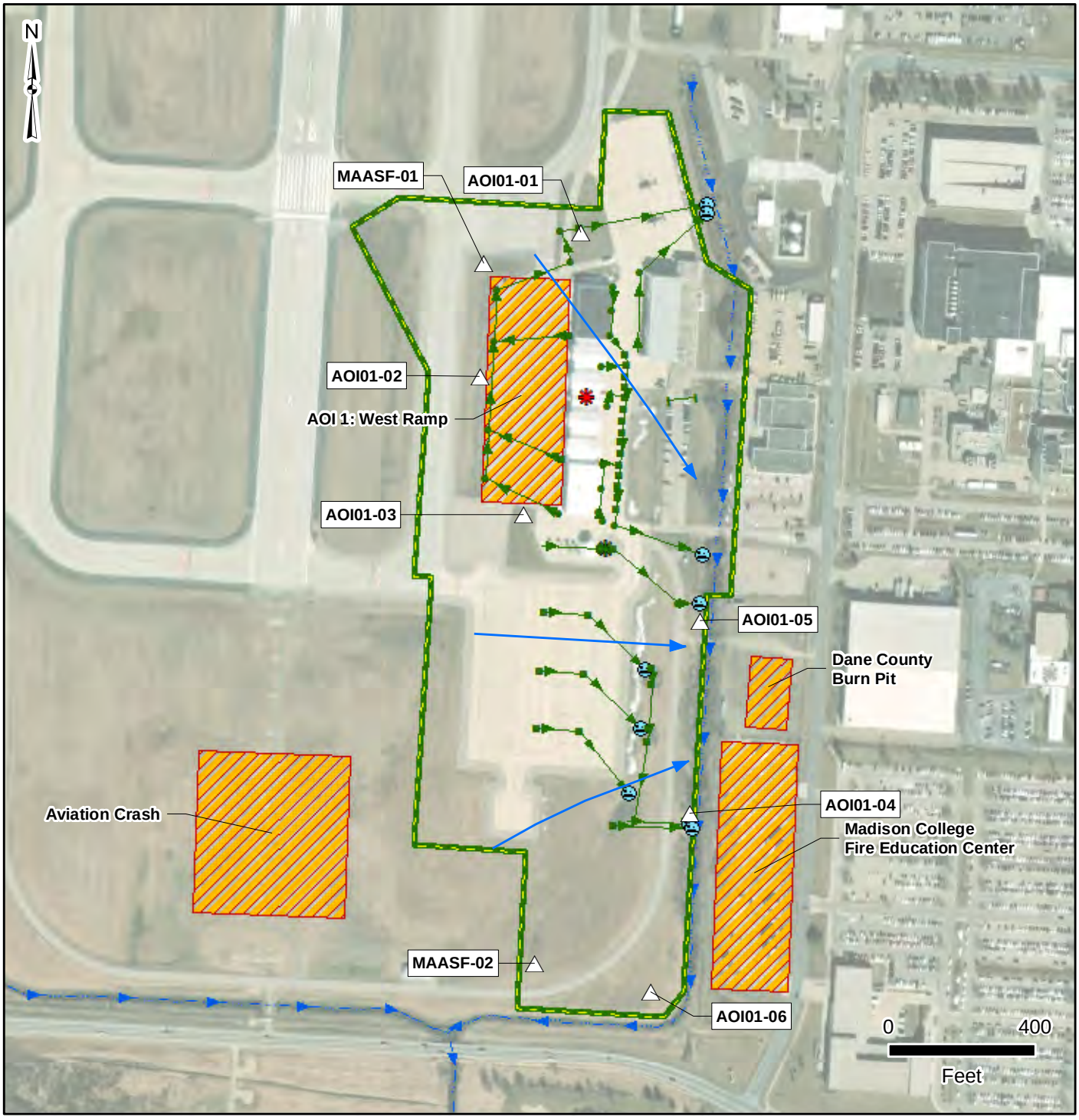
Army National Guard Site Inspections
Site Inspection Report
Madison AASF #2, Wisconsin

Figure 5-1
Site Inspection Sample Locations





Facility Data
- Facility Boundary
- Potential PFAS Release

Sample Location
- Soil Boring & Temporary Groundwater Well Location

Stormwater
- Oil/Water Separator (Sanitary Sewer)
- Oil/Water Separator (Stormwater Sewer)
- Stormwater Inlet
- Stormwater Manhole
- Stormwater Outfall
- Culvert
- Starkweather Creek
- Stormwater Line

Hydrology
- Inferred Shallow Groundwater Flow Direction

Data Sources: ESRI 2020

Date:.....October 2022
Prepared By:.....WSP
Prepared For:.....USACE
Projection:.....NAD 83 UTM 16N

K:\NGB Contract\ARNG PFAS SI\Madison AASF\13.0 GIS_SI\Figure 5-1 Site Inspection Sample Locations.mxd - stephane.descombes - 11/9/2022 - 8:14:48 AM

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6. SITE INSPECTION RESULTS

This section presents the analytical results of the SI. The SLs used in this evaluation are presented in **Section 6.1**. A discussion of the results for the AOI is provided in **Section 6.3** and **6.4**. SLs for relevant compounds, for both soil and groundwater, are presented in **Table 6-1**. **Tables 6-2** through **6-4** present results in soil or groundwater for the relevant compounds. Tables that contain all results are provided in **Appendix F**, and the laboratory reports are provided in **Appendix G**.

6.1 SCREENING LEVELS

The DoD has adopted a policy to retain facilities in the CERCLA process based on risk-based SLs for soil and groundwater, as described in a memorandum from the OSD dated 6 July 2022 (Assistant Secretary of Defense, 2022). The ARNG program under which this SI was performed follows this DoD policy. Should the maximum concentration for sampled media exceed the SLs established in the OSD memorandum, the AOI will proceed the next phase under CERCLA. The SLs established in the OSD memorandum apply to the five compounds presented on **Table 6-1**.

Table 6-1. Screening Levels (Soil and Groundwater)

Analyte[2]	Residential (Soil) (µg/kg)[1] 0-2 ft bgs	Industrial / Commercial Composite Worker (Soil) (µg/kg)[1] 2-15 ft bgs	Tap Water (Groundwater) (ng/L)[1]
PFOA	19	250	6
PFOS	13	160	4
PFBS	1,900	25,000	601
PFHxS	130	1,600	39
PFNA	19	250	6

Notes:
1. Assistant Secretary of Defense. July 2022. Risk Based Screening Levels in Groundwater and Soil using U.S. Environmental Protection Agency's (EPA's) Regional Screening Level Calculator. Hazard Quotient (HQ)=0.1. May 2022.
2. Of the six PFAS compounds presented in the 6 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte at the time of this SI. Based on the CSM developed during the PA and revised based on SI findings, the presence of HFPO-DA is not anticipated at the facility because HFPO-DA is generally not a component of MIL-SPEC AFFF and based on its history including distribution limitations that restricted use of GenX, it is generally not a component of other products the military used. In addition, it is unlikely that GenX would be an individual chemical of concern in the absence of other PFAS.

Abbreviations:
µg/kg = microgram(s) per kilogram
bgs = below ground surface
ft = feet
ng/L = nanogram(s) per liter

The data in the subsequent sections are compared against the SLs presented in **Table 6-1**. The SLs for groundwater are based on direct ingestion. The SLs for soil are based on incidental ingestion and are applied to the depth intervals reasonably anticipated to be encountered by the receptors identified at the Facility: the residential scenario is applied to surface soil results (0 to 2 feet bgs) and the industrial/commercial worker scenario is applied to shallow subsurface soil

results (2 to 15 feet bgs). The SLs are not applied to deep subsurface soil results (>15 feet bgs) because 15 feet is the anticipated limit of construction activities.

6.2 SOIL PHYSICOCHEMICAL ANALYSES

To provide basic soil parameter information, soil samples were analyzed for TOC, pH, and grain size, which are important for evaluating transport through the soil medium. **Appendix F** contains the results of the TOC, pH, and grain size sampling.

The data collected in this investigation will be used in subsequent investigations, where appropriate, to assess fate and transport. According to the Interstate Technology Regulatory Council (ITRC), several important PFAS partitioning mechanisms include hydrophobic and lipophobic effects, electrostatic interactions, and interfacial behaviors. At relevant environmental pH values, certain PFAS are present as organic anions, and are therefore relatively mobile in groundwater (Xiao et al., 2015), but tend to associate with the organic carbon fraction that may be present in soil or sediment (Higgins and Luthy, 2006; Guelfo and Higgins, 2013). When sufficient organic carbon is present, organic carbon normalized distribution coefficients (K_{oc} values) can help in evaluating transport potential, though other geochemical factors (for example, pH and presence of polyvalent cations) may also affect PFAS sorption to solid phases (ITRC, 2018).

6.3 AOI 1

This section presents the analytical results for soil and groundwater in comparison to SLs for AOI 1: West Ramp. The soil and groundwater results are summarized in **Table 6-2** through **Table 6-4**. Soil and groundwater results are presented on **Figures 6-1** through **Figure 6-7**.

6.3.1 AOI 1 Soil Analytical Results

Soil samples were collected from seven boring locations associated with AOI 1 during the SI. **Figure 6-1** through **Figure 6-5** present the ranges of detections in soil. **Table 6-2** and **Table 6-3** summarize the soil results.

Surface soil (0 to 2 ft bgs) was sampled from boring locations AOI01-01 through AOI01-06 and MAASF-01. Soil was also sampled from shallow subsurface soil (2 to 5 ft bgs) and deeper shallow subsurface soil intervals (4 to 9 ft bgs) from boring locations AOI01-01 through AOI01-06 and MAASF-01. PFBS, PFHxS, PFNA, PFOS and PFOA were detected in soil at AOI 1 at concentrations below their respective SLs.

PFBS was detected in one of seven surface sample locations (AOI01-04) with a concentration of 1.5 J µg/kg. PFHxS was detected in four of seven surface soil sample locations (AOI01-01 [and its duplicate], AOI01-04, AOI01-05 [and its duplicate], and MAASF-01) with concentrations ranging from 0.26 J µg/kg to 1.7 µg/kg. PFOS was detected in six of seven sample locations (AOI01-01 [and its duplicate], AOI01-02, AOI01-03, AOI01-04, AOI01-05 [and its duplicate], and MAASF-01). PFOS concentrations ranged from 0.65 J+ µg/kg to 12µg/kg, with the maximum concentration detected in a duplicate sample. PFOA was detected in the surface soil samples from three of seven sample locations (AOI01-01 [and its duplicate], AOI01-05 [only in

the duplicate sample] and MAASF-01). PFOA with concentrations ranged from 0.32 J µg/kg to 0.40 J µg/kg, with the maximum concentration detected in a duplicate sample.

PFBS was detected in one of fourteen shallow subsurface samples (AOI01-05 [3-4 ft bgs]) with a concentration of 0.60 J µg/kg. PFHxS was detected in two of fourteen shallow subsurface samples (AOI01-01 [4-5 ft bgs] and AOI01-04 [3-4 ft bgs]) with concentrations ranging from 0.45 J µg/kg to 2.5 µg/kg. PFOS was detected in eight of fourteen shallow subsurface samples (AOI01-01 [4-5 ft bgs], AOI01-01 [8-9 ft bgs], AOI01-02 [2-3 ft bgs], AOI01-03 [3-4 ft bgs], AOI01-03 [6-7 ft bgs], AOI01-04 [3-4 ft bgs], MAASF-01 [2-3 ft bgs], and MAASF-01 [4-5 ft bgs]) with concentrations ranging from 0.45 J+ µg/kg to 4.1 µg/kg. PFOA was detected in one of fourteen shallow subsurface samples (AOI01-01 [4-5 ft bgs]) with a concentration of 0.63 J µg/kg. PFNA was not detected in any of the fourteen shallow subsurface samples.

6.3.2 AOI 1 Groundwater Analytical Results

Groundwater samples were collected from seven temporary wells associated with AOI 1 during the SI. **Figure 6-4** presents the ranges of detections in groundwater. **Table 6-4** summarizes the groundwater results.

Groundwater was sampled from seven temporary monitoring well locations AOI01-01 through AOI01-06 and MAASF-01. PFHxS, PFNA, PFOS and PFOA were detected at concentrations exceeding their respective SLs. PFBS was detected but did not exceed the SL. PFHxS was detected at all seven locations. The PFHxS SL was exceeded at five locations (AOI01-03, AOI01-04, AOI01-05, AOI01-06, and MAASF-01) with concentrations ranging from 46 ng/L to 590 ng/L. PFNA was detected at six of the seven locations (all but AOI01-06). The PFNA SL was exceeded at two locations (AOI01-03 and MAASF-01) with concentrations of 6.5 ng/L and 8.4 ng/L. PFOS was detected at all seven locations. The PFOS SL was exceeded at six locations (AOI01-01 [and its duplicate] through AOI01-05 and MAASF-01) with concentrations ranging from 22 J ng/L to 860 ng/L. PFOA was detected at all seven locations. The PFOA SL was exceeded at four locations (AOI01-03, AOI01-04, AOI01-05, and MAASF-01) with concentrations ranging from 9.4 ng/L to 35 ng/L. PFBS was detected at concentrations below the SL at all seven locations.

6.3.3 Conclusions

Based on the results of the SI, PFHxS, PFNA, PFOS and PFOA were detected in groundwater at AOI 1 at concentrations above their respective SLs. PFBS, PFHxS, PFNA, PFOS and PFOA were detected in soil below their respective SLs. Based on the exceedances of the SLs in groundwater, further evaluation at AOI 1 is warranted.

6.4 BOUNDARY SAMPLE LOCATIONS

This section presents the analytical results for soil and groundwater in comparison to SLs for samples collected from location MAASF-02 at the Facility boundary. The detected compounds are summarized in **Tables 6-2 through 6-4**. Soil and groundwater results are presented on **Figures 6-1 through 6-7**.

6.4.1 Boundary Sample Locations – Soil Analytical Results

Surface soil (0 to 2 ft bgs) was sampled from boring location MAASF-02. Soil was also sampled from shallow subsurface soil (2 to 5 ft bgs) and deep subsurface soil intervals (4 to 9 ft bgs) from boring location MAASF-02. PFHxS, PFOS and PFOA were detected in the boundary soil sample at concentrations below their respective SLs.

PFHxS was detected in the surface sample with a concentration of 1.1 µg/kg [0.68 J µg/kg in the duplicate]. PFOS was detected in the surface sample with a concentration of 3.6 J+ µg/kg [2.1 J+ µg/kg in the duplicate]. PFOA was detected at the surface sample with a concentration of 0.43 J µg/kg [0.34 J µg/kg in the duplicate]. PFNA and PFBS were not detected in the surface samples.

PFBS, PFHxS, PFNA, PFOS and PFOA were not detected in the shallow subsurface samples.

6.4.2 Boundary Sample Locations – Groundwater Analytical Results

Groundwater was sampled from one temporary boundary monitoring well location, MAASF-02. PFBS, PFHxS, PFNA, PFOS and PFOA were non-detect for the boundary well location.

6.4.3 Conclusions

Based on the results of the SI, PFHxS, PFOS and PFOA were detected in the boundary soil samples of MAASF-02 but at concentrations below their respective SLs. Relevant compounds were not detected in the groundwater sample from boundary location MAASF-02.

Table 6-2
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Surface Soil
Site Inspection Report, Madison AASF#2, Madison, Wisconsin

Area of Interest		AOI01											
Location ID		AOI01-01		AOI01-01		AOI01-02		AOI01-03		AOI01-04		AOI01-05	
Sample Name		AOI01-01-SB-0-2		DUP-01		AOI01-02-SB-0-2		AOI01-03-SB-0-2		AOIO1-04-SB-0-2		AOI01-05-SB-0-2	
		AOI01-01-SB-0-2-03082022		DUP-01-03082022		AOI01-02-SB-0-2-03082022		AOI01-03-SB-0-2-03082022		AOI01-04-SB-0-2-03082022		AOI01-05-SB-0-2-03082022	
Parent Sample ID				AOI01-01-SB-0-2									
Depth (ft)		0-2		0-2		0-2		0-2		0-2		0-2	
Sample Date		3/8/2022		3/8/2022		3/8/2022		3/8/2022		3/8/2022		3/8/2022	
Analyte	**OSD Screening Level[1]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Soil, PFAS by LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)													
PFBS	1,900	ND	U	ND	U	ND	U	ND	U	1.5	J	ND	U
PFHxS	130	0.85		0.80		ND	U	ND	U	1.7		0.37	J
PFNA	19	ND	U	0.27	J	ND	U	ND	U	ND	U	ND	U
PFOS	13	9.5		12		0.65	J+	2.5	J+	2.9	J+	1.1	J+
PFOA	19	0.32	J	0.40	J	ND	U	ND	U	ND	U	ND	U

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

1. Assistant Secretary of Defense, July 2022. Risk Based Screening Levels Calculated for PFOA, PFOS, PFBS, PFHxS, and PFNA in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1. May 2022. Soil Screening levels based on residential scenario for incidental ingestion of contaminated soil.

Interpreted Qualifiers

J = Estimated concentration

J+ = The result is an estimated quantity, but the result may be biased high

U = The analyte was not detected at a level greater than or equal to the adjusted detection limit (DL)

Chemical Abbreviations

PFBS	Perfluorobutanesulfonic acid
PFHxS	Perfluorohexanesulfonic acid
PFNA	Perfluorononanoic acid
PFOS	Perfluorooctanesulfonic acid
PFOA	Perfluorooctanoic acid

Acronyms and Abbreviations

µg/kg	microgram(s) per kilogram
AASF	Army Aviation Support Facility
AOI	Area of Interest
DUP	duplicate
HQ	Hazard Quotient
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
LOQ	limit of quantitation
ND	analyte not detected above the LOD (LOD values are presented in Appendix F)
OSD	Office of the Secretary of the Defense
QSM	Quality Systems Manual
PFAS	per- and polyfluoroalkyl substances
SB	soil boring
USEPA	United States Environmental Protection Agency
Qual	interpreted qualifier

Table 6-2
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Surface Soil
Site Inspection Report, Madison AASF#2, Madison, Wisconsin

Area of Interest		AOI01				Boundary Well			
Location ID		AOI01-05	AOI01-06		MAASF-01		MAASF-02	MAASF-02	
Sample Name		DUP-02	AOI01-06-SB-0-2		MAASF-01-SB-0-2		MAASF-02-SB-0-2	DUP-03	
		DUP-02-03082022	AOI01-06-SB-0-2-03082022		MAASF-01-SB-0-2-03082022		MAASF-02-SB-0-2-03082022	DUP-03-03082022	
Parent Sample ID		AOI01-05-SB-0-2						MAASF-02-SB-0-2	
Depth (ft)		0-2	0-2		0-2		0-2	0-2	
Sample Date		3/8/2022	3/8/2022		3/8/2022		3/8/2022	3/8/2022	
Analyte	**OSD Screening Level[1]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Soil, PFAS by LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)											
PFBS	1,900	ND	U	ND	U	ND	U	ND	U	ND	U
PFHxS	130	1.7	J	ND	U	0.26	J	1.1		0.68	J
PFNA	19	ND	U	ND	U	0.32	J	ND	U	ND	U
PFOS	13	8.2	J	ND	U	7.5		3.6	J+	2.1	J+
PFOA	19	0.38	J	ND	U	0.36	J	0.43	J	0.34	J

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

1. Assistant Secretary of Defense, July 2022. Risk Based Screening Levels Calculated for PFOA, PFOS, PFBS, PFHxS, and PFNA in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1. May 2022. Soil Screening levels based on residential scenario for incidental ingestion of contaminated soil.

Interpreted Qualifiers

J = Estimated concentration

J+ = The result is an estimated quantity, but the result may be biased high

U = The analyte was not detected at a level greater than or equal to the adjusted detection limit (DL)

Chemical Abbreviations

PFBS	Perfluorobutanesulfonic acid
PFHxS	Perfluorohexanesulfonic acid
PFNA	Perfluorononanoic acid
PFOS	Perfluorooctanesulfonic acid
PFOA	Perfluorooctanoic acid

Acronyms and Abbreviations

µg/kg	microgram(s) per kilogram
AASF	Army Aviation Support Facility
AOI	Area of Interest
DUP	duplicate
HQ	Hazard Quotient
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
LOQ	limit of quantitation
ND	analyte not detected above the LOD (LOD values are presented in Appendix F)
OSD	Office of the Secretary of the Defense
QSM	Quality Systems Manual
PFAS	per- and polyfluoroalkyl substances
SB	soil boring
USEPA	United States Environmental Protection Agency
Qual	interpreted qualifier

Table 6-3
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Shallow Subsurface Soil
Site Inspection Report, Madison AASF#2, Madison, Wisconsin

Area of Interest		AOI01											
Location ID		AOI01-01		AOI01-01		AOI01-02		AOI01-02		AOI01-03		AOI01-03	
Sample Name		AOI01-01-SB-4-5		AOI01-01-SB-8-9		AOI01-02-SB-2-3		AOI01-02-SB-4-5		AOI01-03-SB-3-4		AOI01-03-SB-6-7	
Lab ID		AOI01-01-SB-4-5-03082022		AOI01-01-SB-8-9-03082022		AOI01-02-SB-2-3-03082022		AOI01-02-SB-4-5-03082022		AOI01-03-SB-3-4-03082022		AOI01-03-SB-6-7-03082022	
Parent Sample ID													
Depth (ft)		4-5		8-9		2-3		4-5		3-4		6-7	
Sample Date		3/8/2022		3/8/2022		3/8/2022		3/8/2022		3/8/2022		3/8/2022	
Analyte	**OSD Screening Level[1]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Soil, PFAS by LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)													
PFBS	25,000	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFHxS	1,600	2.5		ND	U	ND	U	ND	U	ND	U	ND	U
PFNA	250	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFOS	160	4.1		0.56	J+	0.78	J+	ND	U	0.45	J+	0.89	J+
PFOA	250	0.63	J	ND	U	ND	U	ND	U	ND	U	ND	U

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

1. Assistant Secretary of Defense, July 2022. Risk Based Screening Levels Calculated for PFOA, PFOS, PFBS, PFHxS, and PFNA in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1. May 2022. Soil Screening levels based on Industrial/Commercial Composite Worker scenario for incidental ingestion of contaminated soil.

Interpreted Qualifiers

J = Estimated concentration

J+ = The result is an estimated quantity, but the result may be biased high

U = The analyte was not detected at a level greater than or equal to the adjusted detection limit (DL)

Chemical Abbreviations

PFBS	Perfluorobutanesulfonic acid
PFHxS	Perfluorohexanesulfonic acid
PFNA	Perfluorononanoic acid
PFOS	Perfluorooctanesulfonic acid
PFOA	Perfluorooctanoic acid

Acronyms and Abbreviations

µg/kg	microgram(s) per kilogram
AASF	Army Aviation Support Facility
AOI	Area of Interest
DUP	duplicate
HQ	Hazard Quotient
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
LOQ	limit of quantitation
ND	analyte not detected above the LOD (LOD values are presented in Appendix F)
OSD	Office of the Secretary of the Defense
QSM	Quality Systems Manual
PFAS	per- and polyfluoroalkyl substances
SB	soil boring
USEPA	United States Environmental Protection Agency
Qual	interpreted qualifier

Table 6-3
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Shallow Subsurface Soil
Site Inspection Report, Madison AASF#2, Madison, Wisconsin

Area of Interest		AOI01											
Location ID		AOI01-04		AOI01-04		AOI01-05		AOI01-05		AOI01-06		AOI01-06	
Sample Name		AOIO1-04-SB-3-4		AOIO1-04-SB-6-7		AOI01-05-SB-3-4		AOI01-05-SB-6-7		AOI01-06-SB-4-5		AOI01-06-SB-7-8	
Lab ID		AOI01-04-SB-3-4-03082022		AOI01-04-SB-6-7-03082022		AOI01-05-SB-3-4-03082022		AOI01-05-SB-6-7-03082022		AOI01-06-SB-4-5-03082022		AOI01-06-SB-7-8-03082022	
Parent Sample ID													
Depth (ft)		3-4		6-7		3-4		6-7		4-5		7-8	
Sample Date		3/8/2022		3/8/2022		3/8/2022		3/8/2022		3/8/2022		3/8/2022	
Analyte	**OSD Screening Level[1]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Soil, PFAS by LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)													
PFBS	25,000	ND	U	ND	U	0.60	J	ND	U	ND	U	ND	U
PFHxS	1,600	0.45	J	ND	U	ND	U	ND	U	ND	U	ND	U
PFNA	250	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFOS	160	0.56	J+	ND	U	ND	U	ND	U	ND	U	ND	U
PFOA	250	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

1. Assistant Secretary of Defense, July 2022. Risk Based Screening Levels Calculated for PFOA, PFOS, PFBS, PFHxS, and PFNA in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1. May 2022. Soil Screening levels based on Industrial/Commercial Composite Worker scenario for incidental ingestion of contaminated soil.

Interpreted Qualifiers

J = Estimated concentration

J+ = The result is an estimated quantity, but the result may be biased high

U = The analyte was not detected at a level greater than or equal to the adjusted detection limit (DL)

Chemical Abbreviations

PFBS	Perfluorobutanesulfonic acid
PFHxS	Perfluorohexanesulfonic acid
PFNA	Perfluorononanoic acid
PFOS	Perfluorooctanesulfonic acid
PFOA	Perfluorooctanoic acid

Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AOI	Area of Interest
ft	feet
HQ	hazard quotient
ID	identification
LOD	limit of detection
MDL	method detection limit
ND	analyte was not detected above the LOD. LOD values are presented in Appendix F.
OSD	Office of the Secretary of Defense
PFAS	per- and polyfluoroalkyl substances
Qual	interpreted qualifier
RL	reporting limit
SB	soil boring
USEPA	United States Environmental Protection Agency
µg/kg	micrograms/kilogram

Table 6-3
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Shallow Subsurface Soil
Site Inspection Report, Madison AASF#2, Madison, Wisconsin

Area of Interest		AOI01				Boundary Well			
Location ID		MAASF-01		MAASF-01		MAASF-02		MAASF-02	
Sample Name		MAASF-01-SB-2-3		MAASF-01-SB-4-5		MAASF-02-SB-5-6		MAASF-02-SB-8-9	
Lab ID		MAASF-01-SB-2-3-03082022		MAASF-01-SB-4-5-03082022		MAASF-02-SB-5-6-03082022		MAASF-02-SB-8-9-03082022	
Parent Sample ID									
Depth (ft)		2-3		4-5		5-6		8-9	
Sample Date		3/8/2022		3/8/2022		3/8/2022		3/8/2022	
Analyte	**OSD Screening Level[1]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Soil, PFAS by LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)									
PFBS	25,000	ND	U	ND	U	ND	U	ND	U
PFHxS	1,600	ND	U	ND	U	ND	U	ND	U
PFNA	250	ND	U	ND	U	ND	U	ND	U
PFOS	160	0.63	J+	1.9	J+	ND	U	ND	U
PFOA	250	ND	U	ND	U	ND	U	ND	U

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

1. Assistant Secretary of Defense, July 2022. Risk Based Screening Levels Calculated for PFOA, PFOS, PFBS, PFHxS, and PFNA in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1. May 2022. Soil Screening levels based on Industrial/Commercial Composite Worker scenario for incidental ingestion of contaminated soil.

Interpreted Qualifiers

J = Estimated concentration

J+ = The result is an estimated quantity, but the result may be biased high

U = The analyte was not detected at a level greater than or equal to the adjusted detection limit (DL)

Chemical Abbreviations

PFBS	Perfluorobutanesulfonic acid
PFHxS	Perfluorohexanesulfonic acid
PFNA	Perfluorononanoic acid
PFOS	Perfluorooctanesulfonic acid
PFOA	Perfluorooctanoic acid

Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AOI	Area of Interest
ft	feet
HQ	hazard quotient
ID	identification
LOD	limit of detection
MDL	method detection limit
ND	analyte was not detected above the LOD. LOD values are presented in Appendix F.
OSD	Office of the Secretary of Defense
PFAS	per- and polyfluoroalkyl substances
Qual	interpreted qualifier
RL	reporting limit
SB	soil boring
USEPA	United States Environmental Protection Agency
µg/kg	micrograms/kilogram

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Table 6-4
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Groundwater
Site Inspection Report, Madison AASF#2, Madison, Wisconsin

	Location ID	AOI01-01		AOI01-01		AOI01-02		AOI01-03		AOI01-04		AOI01-05		AOI01-06		MAASF-01		MAASF-02	
	Sample Name	AOI01-01-GW		DUP-01-GW		AOI01-02-GW		AOI01-03-GW		AOI01-04-GW		AOI01-05-GW		AOI01-06-GW		MAASF-01-GW		MAASF-02-GW	
	Lab ID	AOI01-01-GW-03082022		DUP-01-GW-03082022		AOI01-02-GW-03092022		AOI01-03-GW-03092022		AOI01-04-GW-03082022		AOI01-05-GW-03082022		AOI01-06-GW-03082022		MAASF-01-GW-03092022		MAASF-02-GW-03092022	
	Parent Sample ID																		
	Sample Date	3/8/2022		3/8/2022		3/9/2022		3/9/2022		3/8/2022		3/8/2022		3/8/2022		3/9/2022		3/9/2022	
Analyte	**OSD Screening Level [1]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Water, PFAS by LCMSMS compliant with QSM 5.3 Table B-15 (ng/l)																			
PFBS	601	2.6		2.3		1.7	J	9.7		170		81	J-	23		3.0		ND	U
PFHxS	39	25		26		12		120		590		570		71		46		ND	U
PFNA	6	1.4	J	1.3	J	4.0		6.5		0.76	J	2.5		ND	U	8.4		ND	U
PFOS	4	80		81		31		860		22	J	170		0.73	J+	120		ND	U
PFOA	6	1.9		1.9		3.2		16		35		20	J-	4.5		9.4		ND	U

Grey Fill Detected concentration exceeded OSD Screening Levels

References

1. Assistant Secretary of Defense, July 2022. Risk Based Screening Levels Calculated for PFOA, PFOS, PFBS, PFHxS, and PFNA in Groundwater or Soil using USEPA's Regional Screening Level Calculator. HQ=0.1. May 2022. Groundwater Screening levels based on residential scenario for direct ingestion of contaminated groundwater.

Interpreted Qualifiers

J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value
J+ = Result is an estimated quantity, but may be biased high
J- = Result is an estimated quantity, but may be biased low
U = The analyte was not detected at a level greater than or equal to the adjusted detection limit (DL)

Chemical Abbreviations

PFBS	Perfluorobutanesulfonic acid
PFHxS	Perfluorohexanesulfonic acid
PFNA	Perfluorononanoic acid
PFOS	Perfluorooctanesulfonic acid
PFOA	Perfluorooctanoic acid

Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AOI	Area of Interest
DUP	duplicate
HQ	Hazard Quotient
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
LOQ	limit of quantitation
ND	analyte not detected above the LOD (LOD values are presented in Appendix F)
ng/L	nanogram(s) per liter
OSD	Office of the Secretary of the Defense
QSM	Quality Systems Manual
PFAS	per- and polyfluoroalkyl substances
SB	soil boring
USEPA	United States Environmental Protection Agency
Qual	interpreted qualifier

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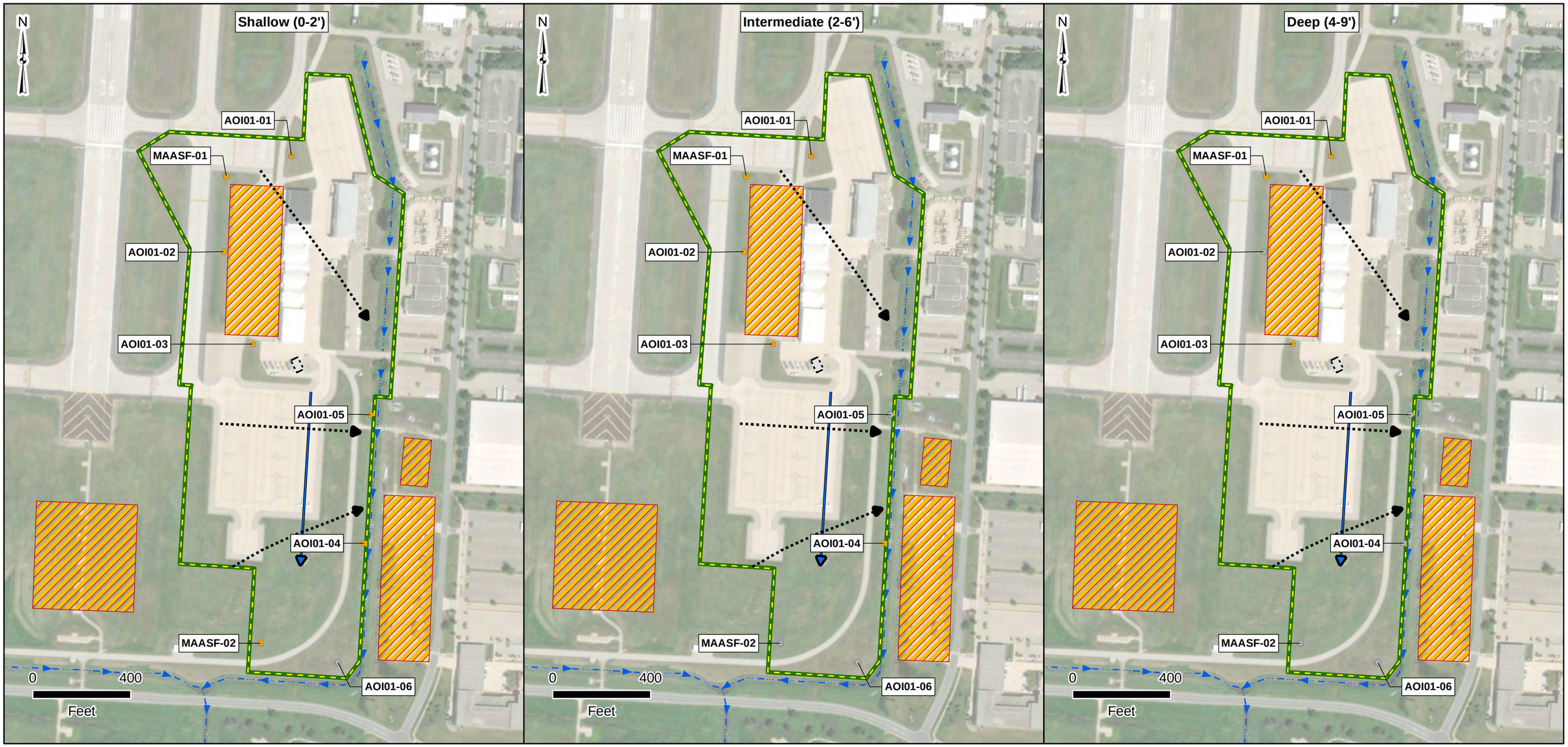
Madison AASF #2, Wisconsin

Figure 6-1
PFOS Detections in Soil



Facility Data
- Facility Boundary
- Potential PFAS Release
- No Suspected Release

Hydrology
- Surface Water Flow Direction
- Inferred Shallow Groundwater Flow Direction
- Starkweather Creek

PFOS Results (µg/kg)
- ND
- >ND - 13
- >13 - 160
- >160 - 1,600
- >1,600

NOTES:
PFOS = perfluorooctanesulfonic acid
ND = Non-Detect
µg/kg = microgram per kilogram
Exceedances of the OSD SL are depicted with a yellow halo

Data Sources:
ESRI 2020

Date:.....October 2022
Prepared By:.....WSP
Prepared For:.....USACE
Projection:.....NAD 83 UTM 16N

K:\NGB Contract\ARNG PFAS SI\Madison AASF\13.0 GIS_SI\Figure 6-1 PFOS Detections in Soil.mxd - stephane.descombes - 3/27/2023 - 11:18:41 AM

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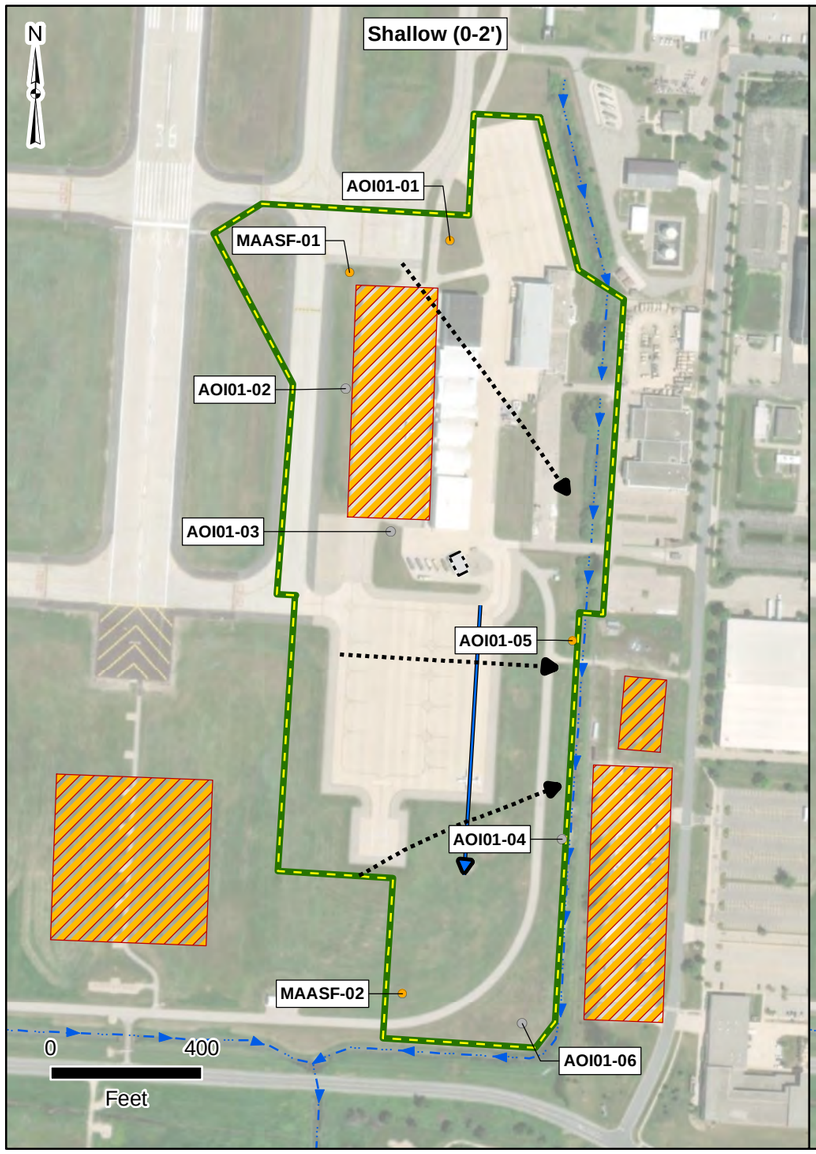
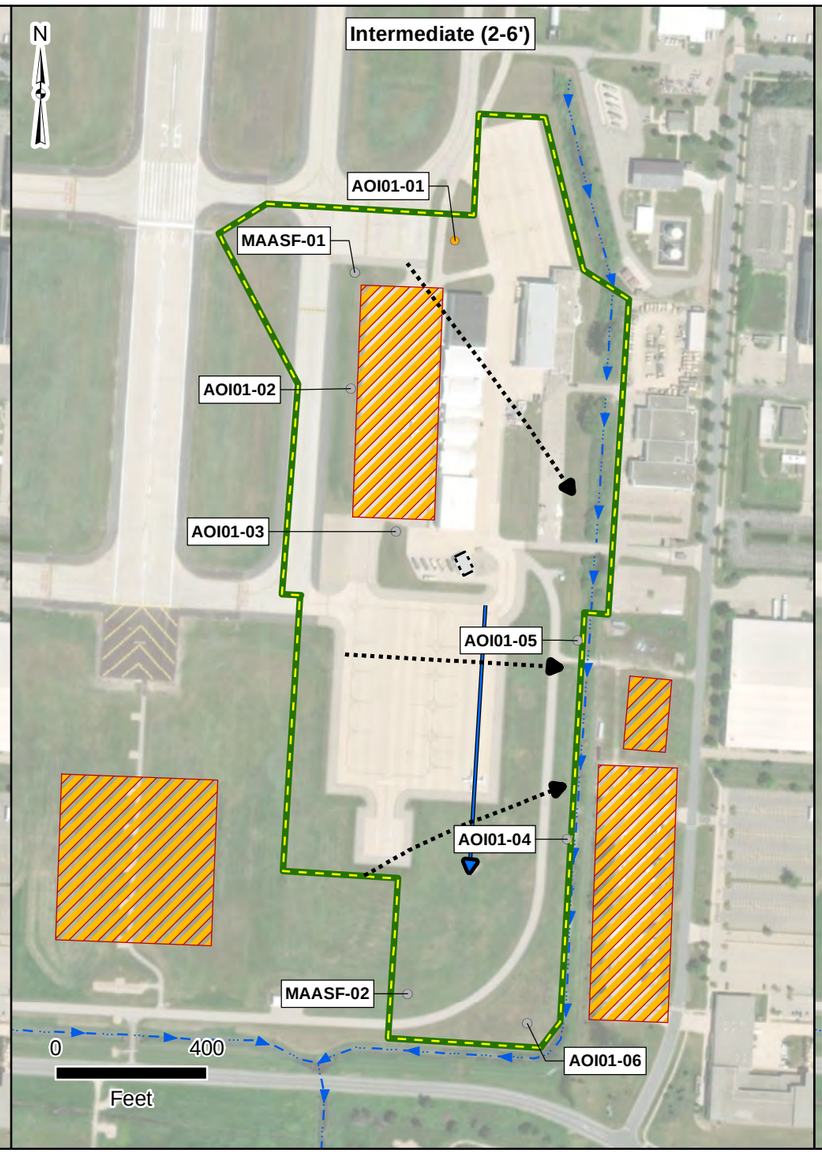
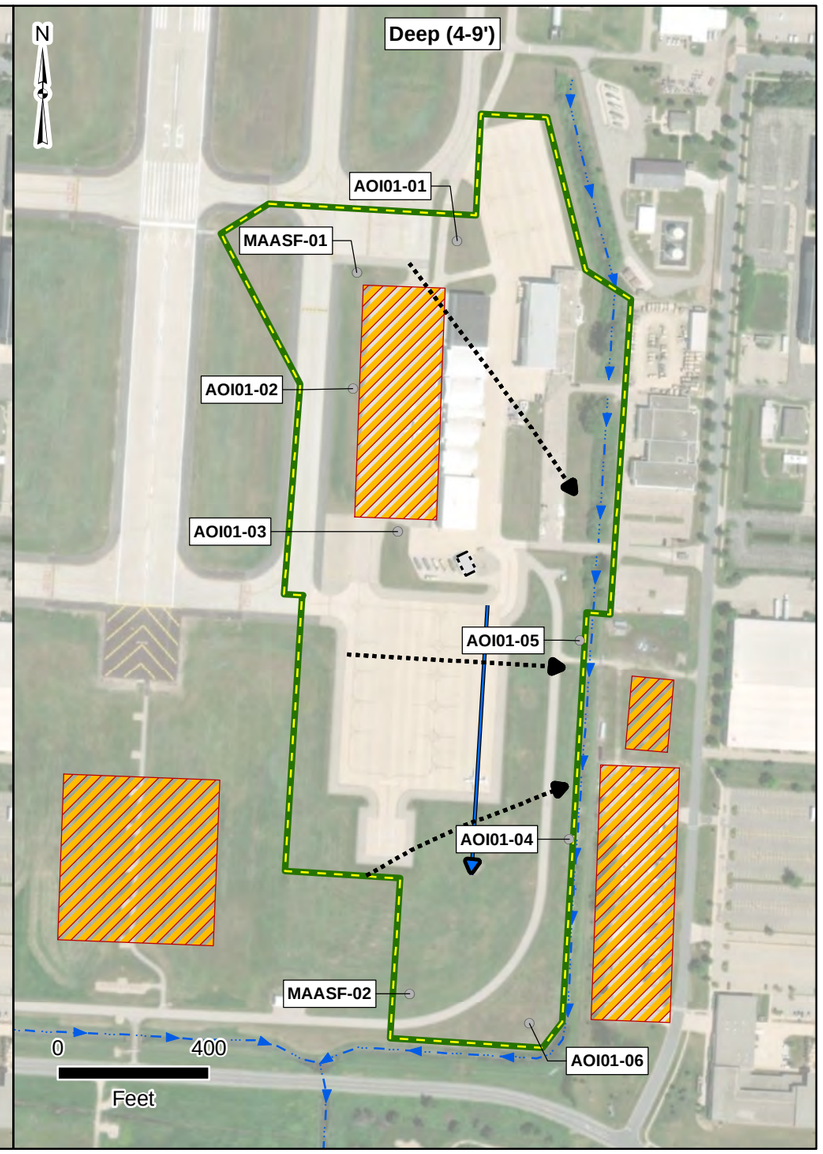
Madison AASF #2, Wisconsin

Figure 6-2
PFOA Detections in Soil







Facility Data
- Facility Boundary
- Potential PFAS Release
- No Suspected Release

Hydrology
- Surface Water Flow Direction
- Inferred Shallow Groundwater Flow Direction
- Starkweather Creek

PFOA Results (µg/kg)
- ND
- >ND - 19
- >19 - 250
- >250 - 2,500
- >2,500

NOTES:
PFOA = perfluorooctanoic acid
ND = Non-Detect
µg/kg = microgram per kilogram
Exceedances of the OSD SL are depicted with a yellow halo

Data Sources:
ESRI 2020

Date:.....October 2022
Prepared By:.....WSP
Prepared For:.....USACE
Projection:.....NAD 83 UTM 16N

K:\NGB Contract\ARNG PFAS SI\Madison AASF\13.0 GIS_SI\Figure 6-2 PFOA Detections in Soil.mxd - stephane.descombes - 3/27/2023 - 11:30:03 AM

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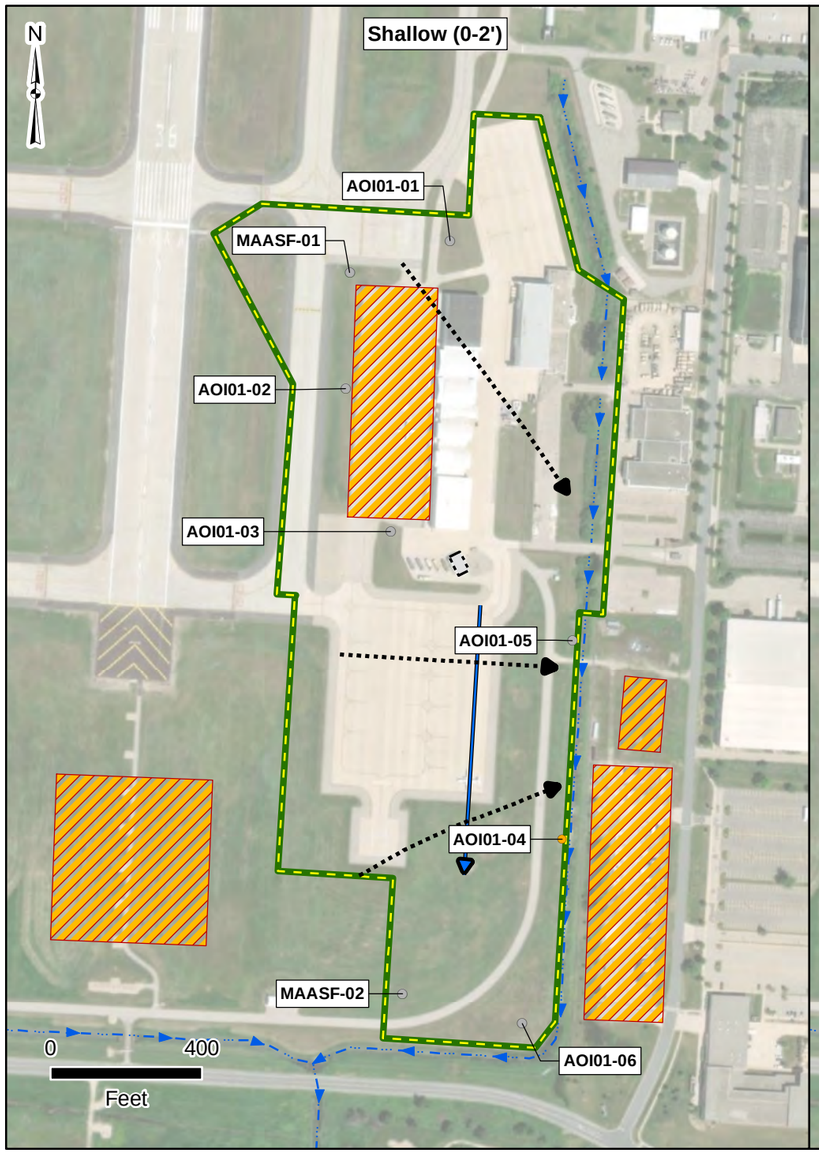
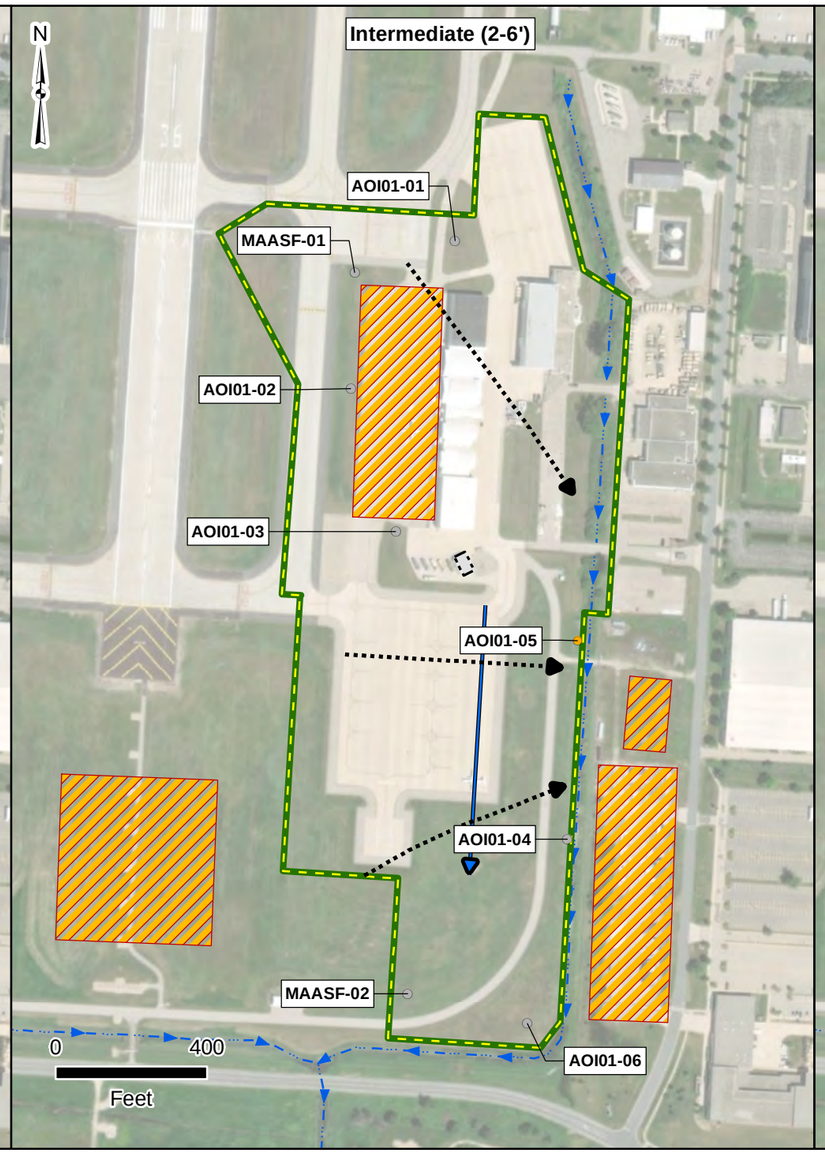
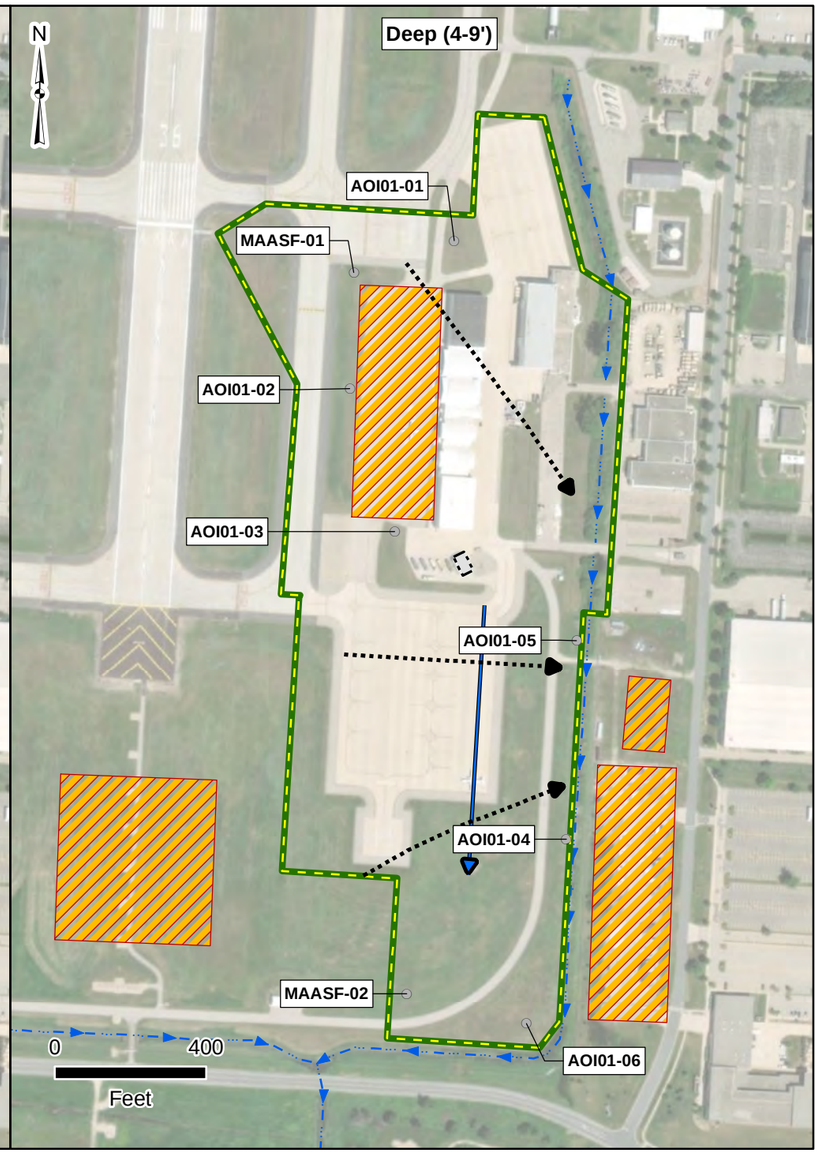
Site Inspection Report
Madison AASF #2, Wisconsin

Figure 6-3
PFBS Detections in Soil







Facility Data
- Facility Boundary
- Potential PFAS Release
- No Suspected Release

Hydrology
- Surface Water Flow Direction
- Inferred Shallow Groundwater Flow Direction
- Starkweather Creek

PFBS Results (µg/kg)
- ND
- >ND - 10
- >10 - 1,900
- >1,900 - 25,000
- >25,000

NOTES:
PFBS = perfluorobutanesulfonic acid
ND = Non-Detect
µg/kg = microgram per kilogram
Exceedances of the OSD SL are depicted with a yellow halo

Data Sources:
ESRI 2020

Date:.....October 2022
Prepared By:.....WSP
Prepared For:.....USACE
Projection:.....NAD 83 UTM 16N

K:\NGB Contract\ARNG PFAS SI\Madison AASF\13.0 GIS_SI\Figure 6-3 PFBS Detections in Soil.mxd - stephane.descombes - 3/27/2023 - 11:33:36 AM

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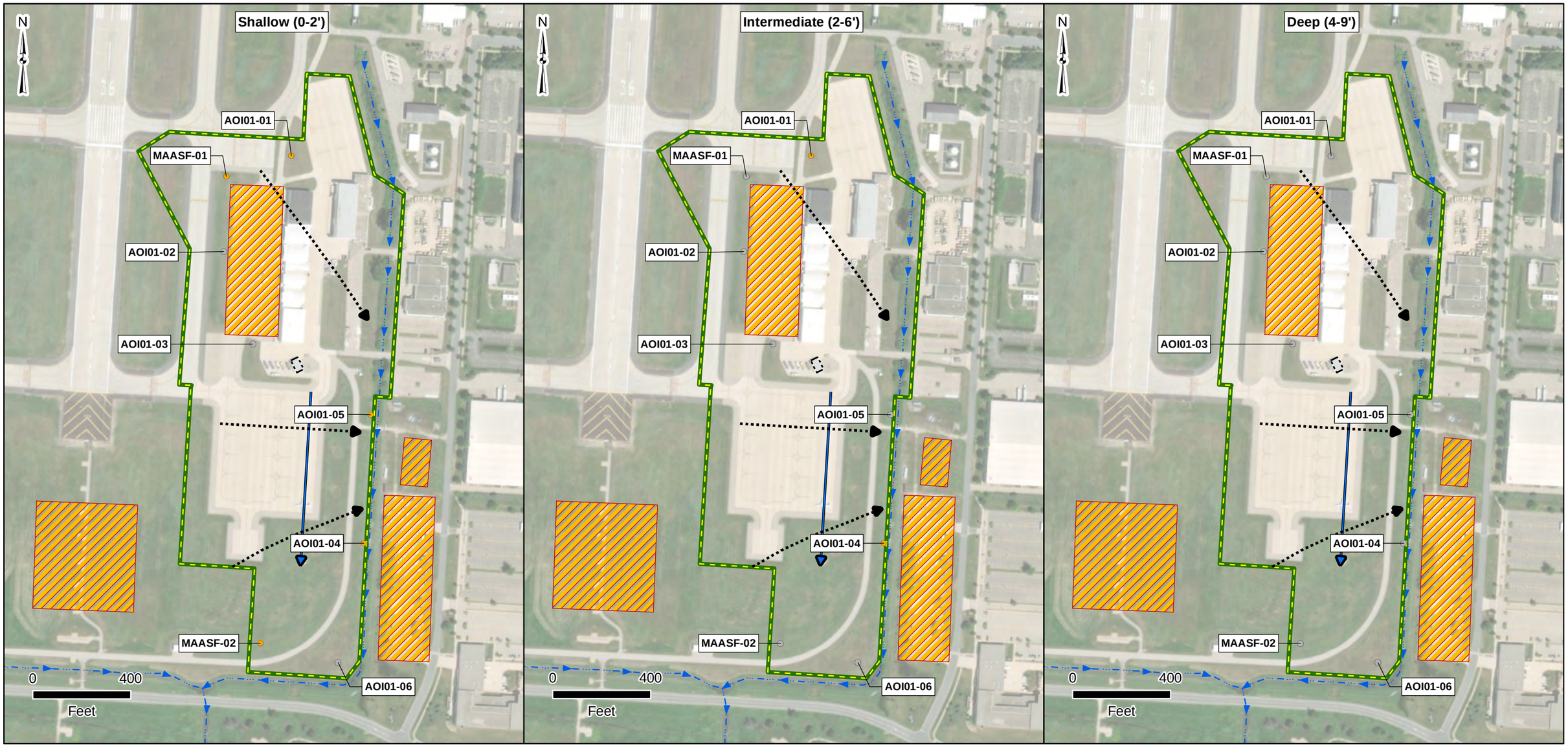
Figure 6-4
PFHxS Detections in Soil



Facility Data
- Facility Boundary
- Potential PFAS Release
- No Suspected Release

Hydrology
- Surface Water Flow Direction
- Inferred Shallow Groundwater Flow Direction
- Starkweather Creek

PFHxS Results (µg/kg)
- >ND
- >ND - 10
- >10 - 130
- >130 - 1,600
- >1,600

NOTES:
PFHxS = Perfluorohexanesulfonic acid
ND = Non-Detect
µg/kg = microgram per kilogram
Exceedances of the OSD SL are depicted with a yellow halo

Data Sources:
ESRI 2020

Date:.....October 2022
Prepared By:.....WSP
Prepared For:.....USACE
Projection:.....NAD 83 UTM 16N

K:\NGB Contract\ARNG PFAS SI\Madison AASF\13.0 GIS_SI\Figure 6-4 PFHxS Detections in Soil.mxd - stephane.descombes - 3/27/2023 - 11:38:26 AM

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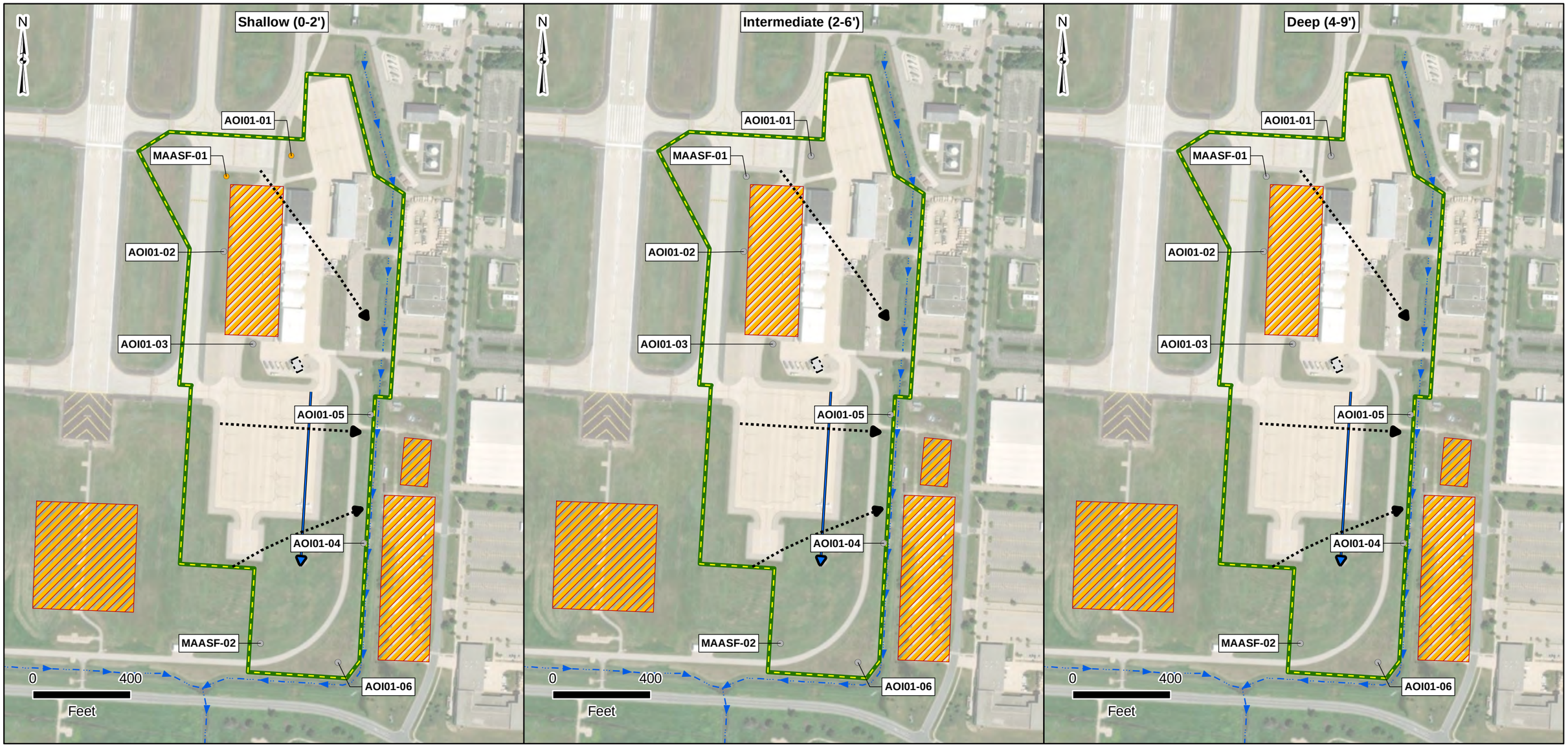
Madison AASF #2, Wisconsin

Figure 6-5
PFNA Detections in Soil



Facility Data
- Facility Boundary
- Potential PFAS Release
- No Suspected Release

Hydrology
- Surface Water Flow Direction
- Inferred Shallow Groundwater Flow Direction
- Starkweather Creek

PFNA Results (µg/kg)
- ND
- >ND - 19
- >19 - 250
- >250 - 2,500
- >2,500

NOTES:
PFNA = Perfluorononanoic acid
ND = Non-Detect
µg/kg = microgram per kilogram
Exceedances of the OSD SL are depicted with a yellow halo

Data Sources:
ESRI 2020

Date:.....October 2022
Prepared By:.....WSP
Prepared For:.....USACE
Projection:.....NAD 83 UTM 16N

K:\NGB Contract\ARNG PFAS SI\Madison AASF\13.0 GIS_SI\Figure 6-5 PFNA Detections in Soil.mxd - stephane.descombes - 3/27/2023 - 11:43:22 AM

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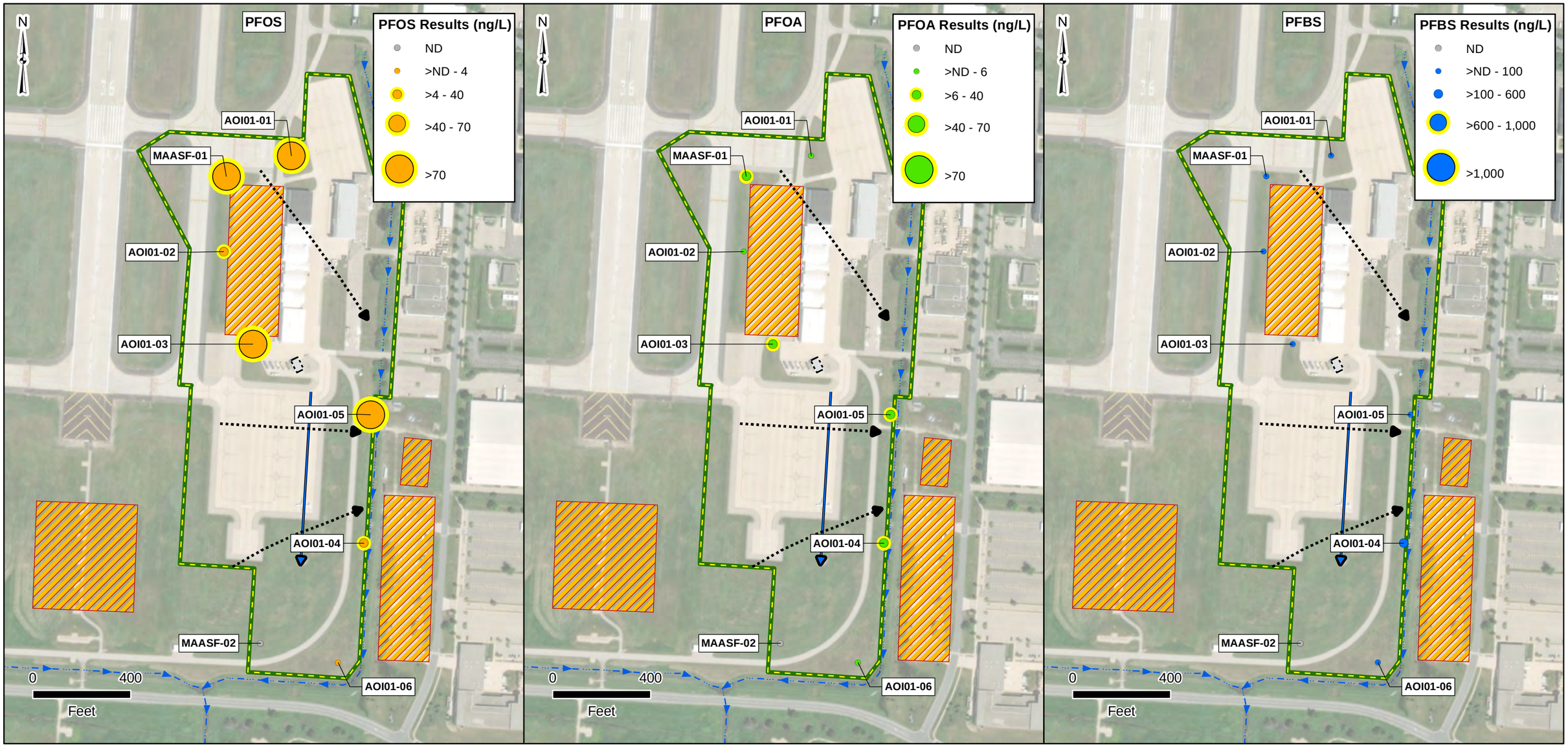
Madison AASF #2, Wisconsin

Figure 6-6
PFOS, PFOA & PFBS Detections in Groundwater



Facility Data
- Facility Boundary
- Potential PFAS Release
- No Suspected Release

Hydrology
- Surface Water Flow Direction
- Inferred Shallow Groundwater Flow Direction
- Starkweather Creek

NOTES:
PFOS = perfluorooctanesulfonic acid
PFOA = perfluorooctanoic acid
PFBS = perfluorobutanesulfonic acid
ND = Non-Detect
ng/L = nanogram(s) per liter
Exceedances of the OSD SL are depicted with a yellow halo

Data Sources:
ESRI 2020

Date:.....October 2022
Prepared By:.....WSP
Prepared For:.....USACE
Projection:.....NAD 83 UTM 16N

K:\NGB Contract\ARNG PFAS SI\Madison AASF\13.0 GIS_SI\Figure 6-6 PFOS-PFOA-PFBS Detections in Groundwater.mxd - stephane.descombes - 3/27/2023 - 11:46:08 AM

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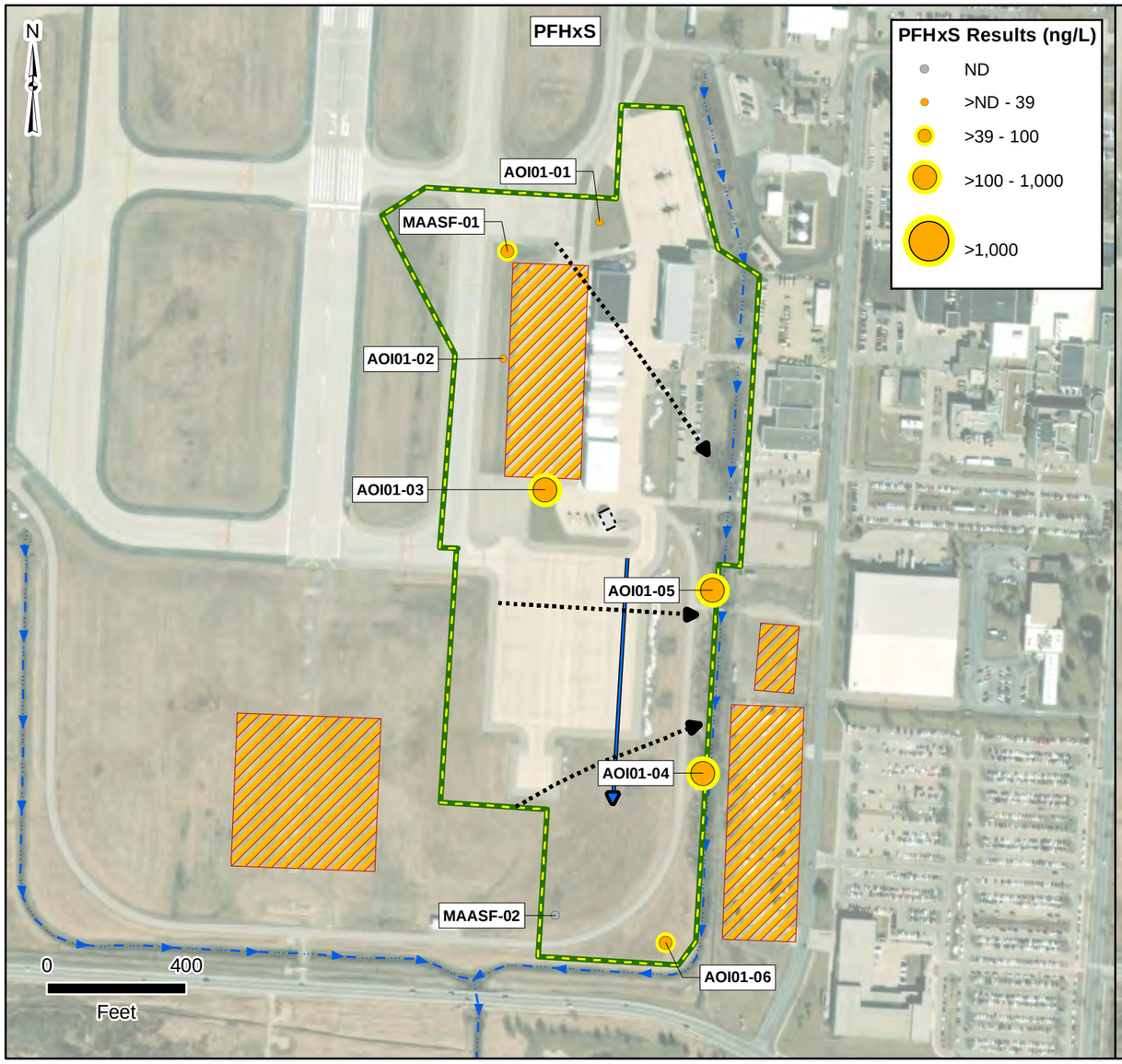
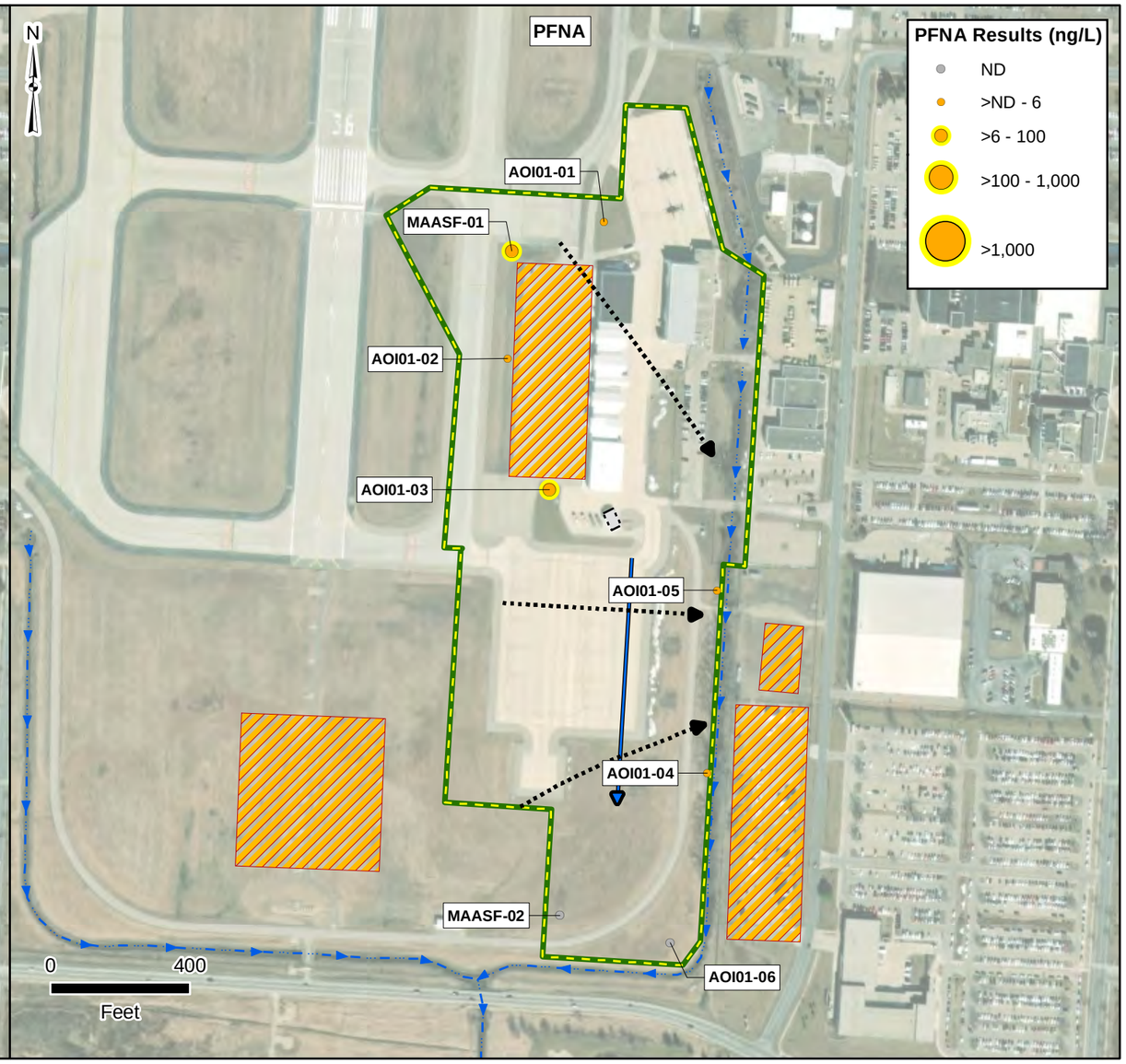
Site Inspection Report
Madison AASF #2, Wisconsin

Figure 6-7
PFHxS & PFNA Detections in Groundwater





Facility Data
- Facility Boundary
- Potential PFAS Release
- No Suspected Release

Hydrology
- Surface Water Flow Direction
- Inferred Shallow Groundwater Flow Direction
- Starkweather Creek

NOTES:
PFHxS = Perfluorohexanesulfonic acid
PFNA = Perfluorooctanoic acid
ND = Non-Detect
ng/L = nanogram(s) per liter
Exceedances of the OSD SL are depicted with a yellow halo

Data Sources:
ESRI 2020

Date:.....October 2022
Prepared By:.....WSP
Prepared For:.....USACE
Projection:.....NAD 83 UTM 16N

K:\NGB Contract\ARNG PFAS SI\Madison AASF\13.0 GIS_SI\Figure 6-7 PFHxS & PFNA Detections in Groundwater.mxd - stephane.descombes - 11/8/2022 - 10:00:46 AM

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7. EXPOSURE PATHWAYS

The Conceptual Site Model (CSM) for the AOI, revised based on the SI findings, is presented on **Figure 7-1**. Please note that while the CSM discussion assists in determining if a receptor may be impacted, the decision to move from SI to RI or interim action is determined based upon exceedances of the SLs for the relevant compounds and whether the release is more than likely attributable to the DoD. A CSM presents the current understanding of the Facility conditions with respect to known and suspected sources, potential transport mechanisms and migration pathways, and potentially exposed human receptors. A human exposure pathway is considered potentially complete when the following conditions are present:

1. Contaminant source;
2. Environmental fate and transport;
3. Exposure point;
4. Exposure route; and
5. Potentially exposed populations.

If any of these elements are missing, the pathway is incomplete. The CSM figure uses an empty circle symbol to represent an incomplete exposure pathway. Areas with no identified complete pathway generally warrant no further action. However, the pathway is considered potentially complete if the relevant compounds are detected, in which case the CSM figure uses a half-filled circle symbol to represent a potentially complete exposure pathway. Additionally, a completely filled circle symbol is used to indicate when a potentially complete exposure pathway has detections of the relevant compounds above the SLs. Areas with an identified potentially complete pathway and a complete pathway may warrant further investigation. Although the CSM indicates whether potentially complete exposure pathways may exist, the recommendation for future study in a RI or no action at this time is based on the comparison of the SI analytical results for the relevant compounds to the SLs.

In general, the potential routes of exposure to the relevant compounds are ingestion and inhalation. Human exposure via the dermal contact pathway may occur, and current risk practice suggests it is an insignificant pathway compared to ingestion; however, exposure data for dermal pathways are sparse and continue to be the subject of toxicological study. The receptors evaluated are consistent with those listed in USEPA guidance for risk screening (USEPA, 2001). Receptors at the facility include site workers (e.g., facility staff and visiting soldiers), construction workers, trespassers, and off-site residents outside the Facility boundary.

7.1 SOIL EXPOSURE PATHWAY

The SI results in soil were used to determine whether a potentially complete pathway exists between the source and potential receptors at each AOI based on the aforementioned criteria.

7.1.1 AOI 1

AOI 1 is the fire extinguisher storage on the West Ramp, which historically had several 60-gallon TriMax™ fire extinguishers in various locations. It is unknown when the TriMax™ fire extinguishers arrived at the Facility; however, they were present until 2008. There are no records

of training, routine maintenance, or annual maintenance. There were no reported leaks or AFFF releases from the TriMax™ fire extinguishers, however it is possible that leakages may have occurred.

PFOA, PFOS, PFHxS, PFNA, and PFBS were detected in soil at AOI 1. Site workers, construction workers, and trespassers could contact constituents in surface soil via incidental ingestion, and inhalation of dust. Therefore, the surface soil exposure pathway for site workers, construction workers, and trespassers are potentially complete. PFOS, PFOA, PFHxS, and PFBS were detected in subsurface soil at AOI 1. Construction workers could contact constituents in subsurface soil via incidental ingestion and inhalation of dust; therefore, the subsurface soil exposure pathway for construction workers is potentially complete. The CSM for AOI 1 is presented on **Figure 7-1**.

7.2 GROUNDWATER EXPOSURE PATHWAY

The SI results in groundwater were used to determine whether a potentially complete pathway exists between the source and potential receptors at each AOI based on the aforementioned criteria.

7.2.1 AOI 1

PFOA, PFOS, PFNA and PFHxS were detected above their respective SLs in groundwater samples collected at AOI 1. Groundwater was encountered at 4-7 ft bgs, therefore, construction workers may come in contact with shallow groundwater during ground-disturbing activities and the ingestion pathway is potentially complete. PFAS are water soluble and can migrate readily from soil to groundwater via leaching. Drinking water for the Madison AASF #2 is supplied by the City of Madison, which obtains its public water supply from the Lower Sandstone Aquifer, which is hundreds of feet bgs (Madison Water Utility, 2021). The nearest municipal water supply wells are located approximately 1 mile southeast of the facility. Based upon this information, the exposure pathway for ingestion of shallow groundwater by site workers, construction workers, trespassers, and recreational users is incomplete. However, it is possible unregistered, private, domestic wells exist downgradient of the identified AOI, which may result in potential exposure via ingestion of groundwater by off-facility residents; therefore, the exposure pathway for ingestion of shallow groundwater by off-facility residents is considered potentially complete. The CSM for AOI 1 is presented on **Figure 7-1**.

7.3 SURFACE WATER AND SEDIMENT EXPOSURE PATHWAY

Starkweather Creek flows from north of the Facility to the south through the east side of the Facility. Stormwater at the Facility is managed by a storm water collection system and man-made ditches with underdrains before being discharged to Starkweather Creek, and ultimately to Lake Monona (AECOM, 2020). Runoff from the facility, or leaching groundwater that vents into surface water bodies, have the potential to transport AFFF or PFAS-impacted soils to water bodies including Starkweather Creek which could affect recreational users.

7.3.1 AOI 1

There were no documented releases of PFAS to the ground surface outside the hangar, but PFAS-containing fire suppressants were stored at the Facility, and there is the potential for PFAS releases inside and immediately surrounding the Main Hangar. There are no documented incidents of PFAS-containing (or potentially containing) fire suppressants being discharged to the stormwater system. However, due to the presence of PFAS in soil, there is the potential for leaching to occur to the groundwater and for stormwater to transport PFAS-impacted soil and runoff to Starkweather Creek. Starkweather Creek runs offsite and ultimately to Lake Monona and therefore there is a potential exposure to recreational user by ingestion of surface water. The CSM is presented in **Figure 7-1**.

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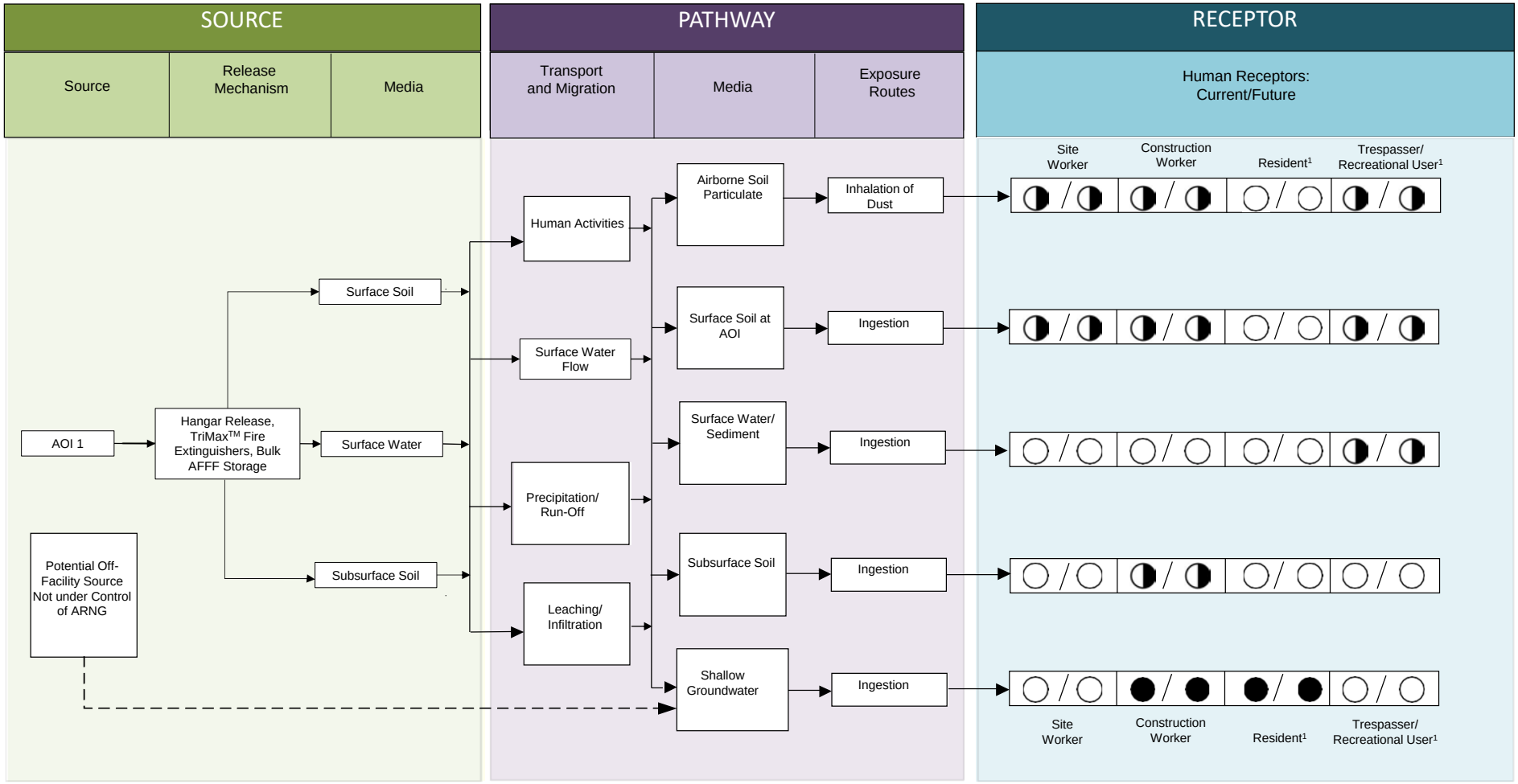

LEGEND

- Flow Chart Continues
- Partial/Possible Flow
- Incomplete Pathway
- Potentially Complete Pathway
- Potentially Complete Pathway with Exceedance of SL

Notes:

1. The resident and recreational users refer to off-site receptors

Figure 7-1
Conceptual Site Model, AOI 1
Madison AASF #2, Wisconsin

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8. SUMMARY AND OUTCOME

This section summarizes SI activities and findings. The most significant findings are summarized in this section and are reproduced directly or abstracted from information contained in this report. The outcome provides general and comparative interpretations of the findings relative to the SLs.

8.1 SI ACTIVITIES

The SI field activities at the Facility were conducted from 8 March to 9 March 2022. The SI field activities included soil and groundwater sampling. Field activities were conducted in accordance with the UFP-QAPP Addendum (EA/Wood, 2022), except as previously noted in **Section 5.8**.

To fulfill the project DQOs set forth in the approved SI UFP-QAPP Addendum (EA, 2021a), samples were collected and analyzed for a subset of 24 compounds by LC/MS/MS compliant with QSM 5.3 Table B-15 as follows.

- Twenty-four (24) soil samples from eight boring locations;
- Eight (8) grab groundwater samples from 8 temporary well locations;
- Six (6) QA/QC samples.

An SI is conducted when the PA determines an AOI exists based on probable use, storage, and/or disposal of PFAS-containing materials. The SI includes multi-media sampling at each AOI to determine whether or not a release has occurred. The SI may conclude further investigation is warranted, a removal action is required to address immediate threats, or no further action is required. Additionally, the CSM was refined to assess whether a potentially complete pathway exists between the source and potential receptors for potential exposure at the AOI, which is described in **Section 7**.

8.2 OUTCOME

Based on the results of this SI, further evaluation under CERCLA in the form of an RI for AOI 1 is warranted. Based on the CSM developed and revised in light of the SI findings, there is potential for exposure to receptors from AOI 1 from sources on the Facility resulting from historical DoD activities.

Sample analytical concentrations collected during the SI were compared against the project SLs in soil and groundwater, as described in **Table 6-1**. A summary of the results of the SI data relative to the SLs is as follows at AOI 1:

- PFOA, PFOS, PFNA, and PFHxS in groundwater exceeded their respective SLs. PFOA exceeded the SL of 6 ng/L with a maximum concentration of 35 ng/L at location AOI01-04. PFOS exceeded the SL of 4 ng/L with a maximum concentration of 860 ng/L at location AOI01-03. PFNA exceeded the SL of 6 ng/L with a maximum concentration of 8.4 ng/L at location MAASF-01. PFHxS exceeded the SL of 39 ng/L with a maximum concentration of 590 ng/L at AOI01-04. Based on the results of the SI, further evaluation

of AOI 1 is warranted in the RI. PFBS was also detected in the groundwater but at concentrations below the SL.

- PFBS, PFHxS, PFNA, PFOS and PFOA were detected in soil below their respective SLs.

Of the six PFAS compounds presented in the 6 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte at the time of this SI. Based on the CSM developed during the PA and revised based on SI findings, the presence of HFPO-DA is not anticipated at the facility because HFPO-DA is generally not a component of MIL-SPEC AFFF and based on its history including distribution limitations that restricted use of GenX, it is generally not a component of other products the military used. In addition, it is unlikely that GenX would be an individual chemical of concern in the absence of other PFAS.

Table 8.1 summarizes the SI results for soil and groundwater used to determine if an AOI should be considered for further investigation under CERCLA and undergo an RI.

Table 8-1. Summary of Site Inspection Findings and Recommendations

AOI	Potential Release Area	Soil – Source Area	Groundwater – Source Area	Groundwater – Facility Boundary	Future Action
1	West Ramp	◐	●	●	Proceed to RI

Legend:
● = Detected; exceedance of screening levels
◐ = Detected; no exceedance of screening levels
○ = Not detected
Abbreviations:
AOI = area of interest
RI = remedial investigation

9. REFERENCES

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