FINAL
Site Inspection Report
Camp Shelby Joint Forces Training Center, Mississippi

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) at ARNG Installations, Nationwide

August 2023

Prepared for:

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

UNCLASSIFIED

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RPG Certification

ARNG PFAS Report:	Site Inspection (SI) Report for the Camp Shelby Joint Forces Training Center, Mississippi
Activity:	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)
Prepared for:	U.S. Army Corps of Engineers, Baltimore District
Prepared by:	AECOM Technical Services, Inc.
SI Location:	Camp Shelby Joint Forces Training Center (CSJFTC)
Date:	28 June 2023

This report, prepared by AECOM Technical Services, Inc. (AECOM), documents the referenced Site Investigation activities and findings associated with the May 2022 field investigation. I, Troy Brumfield, have reviewed this document in sufficient depth to accept responsibility for its contents related to the geologic discussion contained herein.

Troy Brumfield, RPG (Mississippi)
28 June 2023

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Acronyms and Abbreviations

%	percent
°C	degrees Celsius
°F	degrees Fahrenheit
µg/kg	micrograms per kilogram
AECOM	AECOM Technical Services, Inc.
AFFF	aqueous film-forming foam
amsl	above mean sea level
AOI	Area of Interest
ARNG	Army National Guard
ARFF	Aircraft Rescue and Firefighting
AS GSU	Assault Strip Geographically Separated Unit
ASTM	American Society of Testing and Materials
BB&E	BB&E, Inc.
bgs	below ground surface
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
DOT	Department of Transportation
DPT	direct push technology
DQO	data quality objective
DUA	data usability assessment
ELAP	Environmental Laboratory Accreditation Program
EM	Engineer Manual
ERB	equipment rinsate blank
FedEx	Federal Express
GPRS	Ground Penetrating Radar Systems, LLC
HDPE	high-density polyethylene
HFPO-DA	hexafluoropropylene oxide dimer acid
IDW	investigation-derived waste
ITRC	Interstate Technology Regulatory Council
LC/MS/MS	liquid chromatography with tandem mass spectrometry
LDPE	low-density polyethylene
MARIS	Mississippi Automated Resource Information System
MDEQ	Mississippi Department of Environmental Quality
MIL-SPEC	military specification
MSANG	Mississippi Air National Guard
MSARNG	Mississippi Army National Guard
MS/MSD	matrix spike/ matrix spike duplicate
NELAP	National Environmental Laboratory Accreditation Program
ng/L	nanograms per liter
OSD	Office of the Secretary of Defense

OWS	oil water separator
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
PQAPP	Programmatic UFP-QAPP
PVC	polyvinyl chloride
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
QSM	Quality Systems Manual
RI	Remedial Investigation
SI	Site Inspection
SL	screening level
SOP	standard operating procedure
RI	Remedial Investigation
TOC	total organic carbon
TPP	Technical Project Planning
UFP	Uniform Federal Policy
US	United States
USACE	United States Army Corps of Engineers
USACHPPM	United States Army Center for Health Promotion and Preventative Medicine
USAEHA	United States Army Environmental Hygiene Agency
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VSI	Visual Site Inspection
WWTP	wastewater treatment plant

Executive Summary

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

The PA identified three Areas of Interest (AOIs) where PFAS-containing materials may have been used, stored, disposed, or released historically (see **Table ES-2**). Two additional AOIs were added after the PA after the identification of additional historical documents and the programs inclusion of AFFF storage areas as potential release areas. The objective of the SI is to identify whether there has been a release to the environment from the AOIs 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 relevant compounds. This SI was completed at the Camp Shelby Joint Forces Training Center ("Camp Shelby"; also referred to as the "facility") in Mississippi and determined further evaluation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is warranted for AOI 1, AOI 2, and AOI 3; no further evaluation is warranted for AOI 4 and AOI 5 at this time.

Camp Shelby is located in southeastern Mississippi, in Perry, Forrest, and George Counties. Currently, the facility comprises 248 operational ranges that encompass approximately 132,195 acres. Ownership of the Camp Shelby property is divided between the Department of Defense, State, US Forest Service, and private land. The ARNG has designated Camp Shelby as a Maneuver Training Center-Heavy, and the facility is used by both ARNG and Army Reserve. Additionally, the Mississippi Air National Guard is a tenant of Camp Shelby, and they operate their own airfield at the facility. Mississippi ARNG training activities at Camp Shelby include troop bivouacking, wheeled vehicle maneuvers, small arms training, artillery firing exercises, and tank training maneuvers.

The SI sampling results from the five AOIs at Camp Shelby 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 CERCLA is warranted in a Remedial Investigation (RI) for AOI 1, AOI 2, and AOI 3; no further evaluation is warranted for AOI 4 and AOI 5 at this time.

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

Notes:
bgs = below ground surface; µg/kg = micrograms per kilogram; ng/L = nanograms per liter

a.) Assistant Secretary of Defense, 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. 6 July 2022.

b.) 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 ES-2: Summary of Site Inspection Findings and Recommendations

AOI	Potential Release Area	Soil – Source Area	Groundwater – Source Area	Future Action
1	Release Areas A & F	●	●	Proceed to RI
2	Release Area B	●	●	Proceed to RI
3	Release Areas C & D	◐	●	Proceed to RI
4	Release Area E	○	◐	No further action
5	Release Area G	◐	◐	No further action

Notes: AOI = Area of Interest; N/A = not applicable; RI = Remedial Investigation

Legend:
● = detected; exceedance of the screening levels
◐ = detected; no exceedance of the 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) on the current or potential historical use of per- and polyfluoroalkyl substances (PFAS) with a focus on the six compounds presented in the memorandum from the Office of the Secretary of Defense (OSD) dated 6 July 2022 (Assistant Secretary of Defense, 2022). The six compounds listed in the OSD memorandum will be referred to as "relevant compounds" throughout this document and include perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA), hexafluoropropylene oxide dimer acid (HFPO-DA)[1], and perfluorobutanesulfonic acid (PFBS) at ARNG facilities nationwide. The ARNG performed this SI at the Camp Shelby Joint Forces Training Center, Mississippi. The Camp Shelby Joint Forces Training Center is also referred to as "Camp Shelby" or the "facility" throughout this document.

The SI project elements were performed in compliance with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA; United States [US] 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 US Department of the Army (DA) requirements and guidance for field investigations.

1.2 SI Purpose

A PA was performed at Camp Shelby (AECOM Technical Services, Inc. [AECOM], 2020) that identified three Areas of Interest (AOIs) where PFAS-containing materials may have been used, stored, disposed, or released historically. Two additional AOIs were added after the PA after the identification of additional historical documents and the programs inclusion of aqueous film-forming foam (AFFF) storage areas as potential release areas. The objective of the SI is to identify whether there has been a release to the environment from the AOIs 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) 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

Camp Shelby is located in southeastern Mississippi, in Perry, Forrest, and George Counties (**Figure 2-1**). Currently, the facility comprises 248 operational ranges that encompass approximately 132,195 acres. Camp Shelby is composed of property belonging in four different categories: Department of Defense (DoD), State, US Forest Service (USFS), and private land. The State of Mississippi owns and manages 7,927 acres of Camp Shelby, 7,268 acres are owned by the DoD, and the USFS has jurisdiction over roughly 117,000 acres that fall within the De Soto National Forest. The DoD and state lands are managed by the Mississippi ARNG (MSARNG) in support of the military mission. Private land is leased to MSARNG for military use, which includes low impact training. The main part of Camp Shelby's training area belongs to the USFS and is operated under a Special Use Permit from the USFS granted in 2007 for 20 years. In 2007, the Final Environmental Impact Statement for Renewal of Special Use Permit on the De Soto National Forest and the Implementation of Installation Mission Support Activities at Camp Shelby, Mississippi were completed and allowed military training to continue on National Forest Lands. Approximately 88 percent (%) of Camp Shelby is within the De Soto National Forest, and the USFS still is the land manager for these areas (MSARNG, 2014).

The ARNG has designated Camp Shelby as a Maneuver Training Center-Heavy, and both ARNG and Army Reserve use the facility. Additionally, the Mississippi Air National Guard (MSANG) is a tenant of the facility via the C-17 Assault Strip Geographically Separated Unit (AS GSU) on Camp Shelby. The C-17 AS GSU is used primarily for short runway takeoff and landing training, and it includes a runway, taxiway, control tower, fire/rescue station, and maintenance bay/administrative building (BB&E, Inc. [BB&E], 2016). Training activities at Camp Shelby include troop bivouacking, wheeled vehicle maneuvers, small arms training, artillery firing exercises, and tank training maneuvers. US Highway 49 and Highway 98 are located west and north of the facility, respectively, and are major access routes to Camp Shelby. The latitude, longitude, and surface elevation at the main gate of the facility are 31°11'21.3" N; 89°14'16.3" W, and 320 feet above mean sea level (amsl), respectively.

2.2 Facility Environmental Setting

Camp Shelby is characterized by gently rolling to hilly topography, with rounded ridges and broad, mature drainage plains (**Figure 2-2**). Topographic relief ranges from 60 to 120 feet between depressions and ridgetops. Surface elevations range from 150 feet amsl in Black Creek Valley to 280 feet amsl in the cantonment area (MSARNG, 2001).

2.2.1 Geology

Camp Shelby is underlain by limestone, sandstone, and interbedded fine- to coarse-grained sediments, including terrace and alluvial deposits (**Figure 2-3**). The youngest deposits exposed at Camp Shelby are the Pliocene-aged Citronelle Formation, Pleistocene-aged terrace deposits, and recent alluvial deposits. The Citronelle Formation is primarily composed of cross-bedded sand and gravel with some clay interbeds and is exposed primarily along hilltops in the region. The Pleistocene-aged terrace deposits and recent alluvial deposits are comprised of lenticular sands, gravels, and clays and range from 0 to 100 feet thick (US Army Center for Health Promotion and Preventative Medicine [USACHPPM], 1999). They are exposed along major stream valleys, including the Leaf River to the northwest of the facility, and along several small creeks exiting the facility to the southwest (US Army Environmental Hygiene Agency [USAEHA], 1991). Additionally, a fluvial paleochannel underlies the Leaf River to the northwest of Camp

Shelby. This Pleistocene-aged channel deposit is approximately 80 feet deep and is in contact with the Miocene-aged Hattiesburg Formation's upper sand unit in this area (Brown, 1944).

The Hattiesburg and Pascagoula Formations are both Miocene-aged and composed of lenticular clay layers, silts, sands, and gravels. The lower portion of the Hattiesburg Formation contains two water-bearing sand units informally known as the upper and lower Hattiesburg sands. Though the upper sand unit serves as a local aquifer in some areas, the lower sand unit (approximately 90 feet thick) serves as a major aquifer in the Camp Shelby area. Overlying the lower sand layer are several hundred feet of interbedded massive clays, clayey silts, and sandy silts. The Hattiesburg Formation thickness ranges from 1 to 600 feet, and depths range from 0 to 400 feet bgs. The formation outcrops in the northern portion of the facility and within local stream valleys. The Pascagoula Formation is a series of lenticular clays, silts, and sands; it ranges in thickness from 1 to 730 feet (USACHPPM, 1999; USAEHA, 1991).

The Miocene-aged Catahoula Formation, which consists of interbedded clay, silt, sand, and gravel, underlies the Hattiesburg and Pascagoula formations. The Catahoula Formation ranges in thickness from 240 to 640 feet thick and is found at a depth of 600 to 700 feet bgs. The Paleogene-aged Chickasawhay Limestone underlies the Catahoula Formation and is a massive limestone unit found approximately 300 to 2,320 feet below ground surface (bgs). The Cypress Creek salt dome underlies the Chickasawhay Limestone in the northern portion of the facility and imparts a south-southwest dip to the overlying formations at approximately 20 to 45 feet per mile (USAEHA, 1991; USACHPPM, 1999).

During the SI, low- to medium-plasticity fines (silts) and sands were observed as the dominant lithology of the unconsolidated sediments below Camp Shelby. The borings were completed at depths between 4 and 40 feet bgs. Surficial soils at the facility were primarily composed of silt and sandy silt. Sand-rich layers ranged in thickness from 1 and 36 feet thick and were observed at depths ranging between 8 and 40 feet bgs. Sand packages were primarily poorly graded, with varying amounts of silt. Well-graded sand was observed at the bottom of some of the borings. Bedding structures observed in the borings included thin (millimeter-thick) laminations within some silt and sand layers. Additionally, a few logs contained medium to high plasticity clay layers between 0.5 and 4 feet thick, with a 26-foot clay layer observed in one boring (AOI03-02). The soils observed in the borings are consistent with the sands and silts expected in the surficial units at Camp Shelby. Boring logs are presented in **Appendix E**.

2.2.2 Hydrogeology

The three major aquifers beneath Camp Shelby are, in ascending order, the confined Catahoula Formation, the lower and upper sands of the Hattiesburg Formation, and the unconfined Citronelle aquifer. The Hattiesburg aquifer and the Catahoula aquifer comprise the Neogene aquifer system and serve as the source for domestic, municipal, and industrial water supplies in the area (USACHPPM, 1999).

The uppermost hydrogeologic unit is the unconfined Citronelle aquifer, which consists of up to 150 feet of unconsolidated sands and sparse silty clay and gravel deposits. The lower portions of this aquifer are used for agricultural and domestic water wells. Underlying the Citronelle aquifer is the upper portion of the Hattiesburg Formation, which contains several hundred feet of massive clays, clayey silts, and sandy silts. These relatively impermeable sediments confine the underlying water-bearing units (upper and lower Hattiesburg sands) within the lower portion of the Hattiesburg Formation. The upper Hattiesburg sand unit is thin and discontinuous but serves as a minor aquifer in some areas, while the lower Hattiesburg sand unit is approximately 90 feet thick and serves as a major potable water source in other areas, including Camp Shelby. The lower Hattiesburg sand unit is separated from the underlying water-bearing sands of the

Catahoula Formation by impermeable, clay-rich confining layers (US Army Corps of Engineers [USACE], 2009; USACE, 2015).

Depths to the water table at Camp Shelby are shallowest at lower elevations in the stream valleys and deeper in the elevated regions (**Figure 2-4**). Depth to water measurements in the Citronelle aquifer collected near stream valleys around the central portion of the facility ranged from less than 2 feet to approximately 8 feet bgs (Slack et al., 2004). According to the geohydrologic study of firing points and the impact area at Camp Shelby (i.e., the central portion of the facility), depth to the potentiometric surface of the confined Hattiesburg aquifer is less than 50 feet bgs (USACHPPM, 1999). During the SI, groundwater elevations in the unconfined water table aquifer that were collected in the northwest part of Camp Shelby ranged from approximately 9 to 35.5 feet bgs.

Groundwater infiltrates readily into the unconfined, permeable Citronelle aquifer, migrating downward and downslope until it is halted by less permeable clay layers. Clays with low hydraulic conductivity underly the majority of the facility and prevent significant aquifer contamination by surface activities (USACHPPM, 1999; Slack et al., 2004). Several seeps are present in the valleys at the base of the Citronelle Formation, indicating that groundwater is discharging at the top of these clays. The clay layers are relatively impermeable and prevent shallow groundwater from reaching the Hattiesburg aquifer (the Hattiesburg Formation upper and lower sands), and the shallow groundwater in both formations (Citronelle and Hattiesburg) discharges to seeps and streams around Camp Shelby (USACHPPM, 1999).

Groundwater recharge occurs at topographic highs, whereas discharge occurs in adjacent topographic lows. The presence of numerous wetlands surrounding the creeks at Camp Shelby, and shallow groundwater measurements in these areas, indicate that groundwater likely discharges to the surface water. Natural recharge to the Citronelle aquifer in the Camp Shelby area is primarily through surface infiltration. Though the Pascagoula and Hattiesburg Formations are also exposed at Camp Shelby, the Pascagoula Formation does not contain an aquifer, and the Hattiesburg aquifer has an upward gradient and is confined beneath clay layers. Therefore, surface water that infiltrates the exposed Pascagoula or uppermost Hattiesburg Formations at Camp Shelby is not expected to reach the Hattiesburg or Catahoula aquifers (USACE, 2015).

The shallow groundwater flow directions of the Citronelle and Hattiesburg aquifers are understood to be locally variable due to topography and lithology. Based on historical studies and confirmed by SI results, a shallow groundwater divide is believed to run northwest to southeast across the northern region of Camp Shelby (USACE, 2015). Northeast of this divide, the shallow groundwater flows generally to the north, toward the Leaf River; southwest of this divide, groundwater flows south to the Black Creek (**Figure 2-4**).

Downgradient of Camp Shelby's operational areas, groundwater is sourced from domestic and public water supply wells that are screened in the Citronelle, Hattiesburg, and Catahoula aquifers, but primarily within the Hattiesburg and Catahoula aquifers. Well depths range from 30 to 900 feet bgs for the private wells and 180 to 1,090 feet bgs for the public supply wells (Mississippi Automated Resource Information System [MARIS], 2009; MARIS, 2010); most wells are screened in the confined aquifers from 100 to 1,000 feet bgs. These confined aquifers are laterally discontinuous and are separated by clay-rich units (Slack et al., 2004). Six active water supply wells exist on Camp Shelby (four in the cantonment area and two in the operational area) and are screened between 400 and 1200 feet deep within the lower sand of the Hattiesburg Formation. Data for samples collected from the Camp Shelby drinking water wells in March 2017 were provided by ARNG. The samples were analyzed for 18 PFAS analytes; PFOA, PFOS, PFHxS, PFNA, and PFBS were not detected in the samples.

Depths to water measured in May 2022 during the SI ranged from 8.92 to 35.50 feet bgs. Groundwater elevation contours from the SI are presented on **Figure 2-4** and indicate that the

groundwater flow direction at Camp Shelby is locally variable. The overall flow direction is likely primarily to the east, which is evident at AOI 1. However, due to the presence of a northwest-southeast groundwater divide, shallow groundwater likely flows north toward the Leaf River in the vicinity of AOIs 3 and 4, but near AOIs 2 and 5, it likely flows south/southeast, towards the Black Creek.

2.2.3 Hydrology

Camp Shelby lies within the Pascagoula River basin. The major sub basins in the region are the Leaf River, near the north and northeast boundaries of Camp Shelby, and Black Creek to the south. There are 744.2 miles of streams on Camp Shelby. Several streams, including the Garraway, Denham, Milky, Coleman, Carter, and Little Creeks, drain into the Leaf River. Black Creek tributaries drain 90% of Camp Shelby. The primary Black Creek tributaries on Camp Shelby include Chaney, Middle, Davis, Hartfield, Poplar, Pearces, Cypress, and Hickory Creeks. The southeastern portion of Camp Shelby is drained by Whiskey Creek, which flows into the Pascagoula River. The Garraway, Denham, Milky, Coleman, extreme lower Poplar, and lower Hickory Creeks are intermittent streams (MSARNG, 2007). A 21-mile section of Black Creek is federally designated as a Scenic River and is considered a sensitive environment for the 2009 Phase I Assessment (USACE, 2009). The Leaf and Pascagoula Rivers are within the 15-mile downstream surface water receptor zone for Camp Shelby. Both rivers are considered high-quality recreational-use streams.

Lakes located on the facility include Dogwood Lake in the northwest corner of the operational area, and Walker Lake, north of the operational area. These lakes are used primarily for recreation by active, Reserve, and retired military members and their families. Recreational activities include fishing, swimming, and boating. Janney Lake is located on the western edge of the impact area buffer zone, but it is off limits to recreational use (MSARNG, 2001). Surface water features are presented on **Figure 2-5**.

2.2.4 Climate

Camp Shelby has a temperate to subtropical climate that is influenced primarily by warm, humid conditions of the Gulf of Mexico. Persistent humidity, moderate to heavy precipitation, and mild temperatures are typical in this region. Hurricane conditions may occur during the summer and fall. The average annual high temperature in Hattiesburg, Mississippi is 76 degrees Fahrenheit (°F), and the average annual low temperature is 56 °F. The area receives an average of 61.59 inches of rain per year (US Climate Data, 2022).

2.2.5 Current and Future Land Use

Camp Shelby is one of the largest state-owned US Army training sites in the nation. Camp Shelby serves as a training site for active and reserve Army component units and hosts National Guardsmen and Reservists from throughout the country. Training activities at the facility include troop bivouacking, wheeled vehicle maneuvers, small arms training, artillery firing exercises, and tank training maneuvers. Reasonably anticipated future land use is not expected to change from the current land use.

2.2.6 Sensitive Habitat and Threatened/ Endangered Species

Camp Shelby is primarily located within the De Soto National Forest and thus contains many wildlife habitats. A 2012 wildlife survey funded by the MSARNG indicates that Camp Shelby is home to numerous species, some of which are considered threatened or endangered by the US Fish and Wildlife Service ([USFWS]; The Nature Conservancy, 2012). According to the USFWS,

critical habitats at Camp Shelby are associated with the following endangered species listed below: Black Pinesnake, Dusky Gopher Frog, and Gulf Sturgeon (USFWS, 2022).

The following amphibians, birds, fishes, ferns and allies, insects, mammals, and reptiles are federally endangered, threatened, proposed, and/ or are listed as candidate species in Perry, Forrest, and George Counties, Mississippi (USFWS, 2022).

- **Amphibians:** Dusky Gopher Frog, *Rana sevosa* (endangered)
- **Birds:** Red-cockaded Woodpecker, *Picoides borealis* (endangered)
- **Fishes:** Gulf Sturgeon, *Acipenser oxyrinchus* (threatened); Pearl Darter, *Percina aurora* (threatened)
- **Ferns and Allies:** Louisiana Quillwort, *Isoetes louisianensis* (endangered)
- **Insects:** Monarch butterfly, *Danaus plexippus* (candidate)
- **Mammals**: West Indian Manatee, *Trichechus manatus* (threatened/ marine)
- **Reptiles**: Black Pinesnake, *Pituophis melanoleucus lodingi* (threatened); Eastern Indigo Snake, *Drymarchon couperi* (threatened); Gopher Tortoise, *Gopherus polyphemus* (threatened); Yellow-blotched Map Turtle, *Graptemys flavimaculata* (threatened)

2.3 History of PFAS Use

Four potential release areas were identified in the PA where AFFF may have been used, stored, disposed, or released historically at Camp Shelby (AECOM, 2020). Three additional potential release areas were identified and added after the PA. AFFF may have historically been released at the facility during emergency response activities, handling and storage of bulk AFFF, and waste management activities. The seven potential release areas were grouped into five AOIs based on preliminary data and presumed groundwater flow directions. A description of each AOI is presented in **Section 3**.

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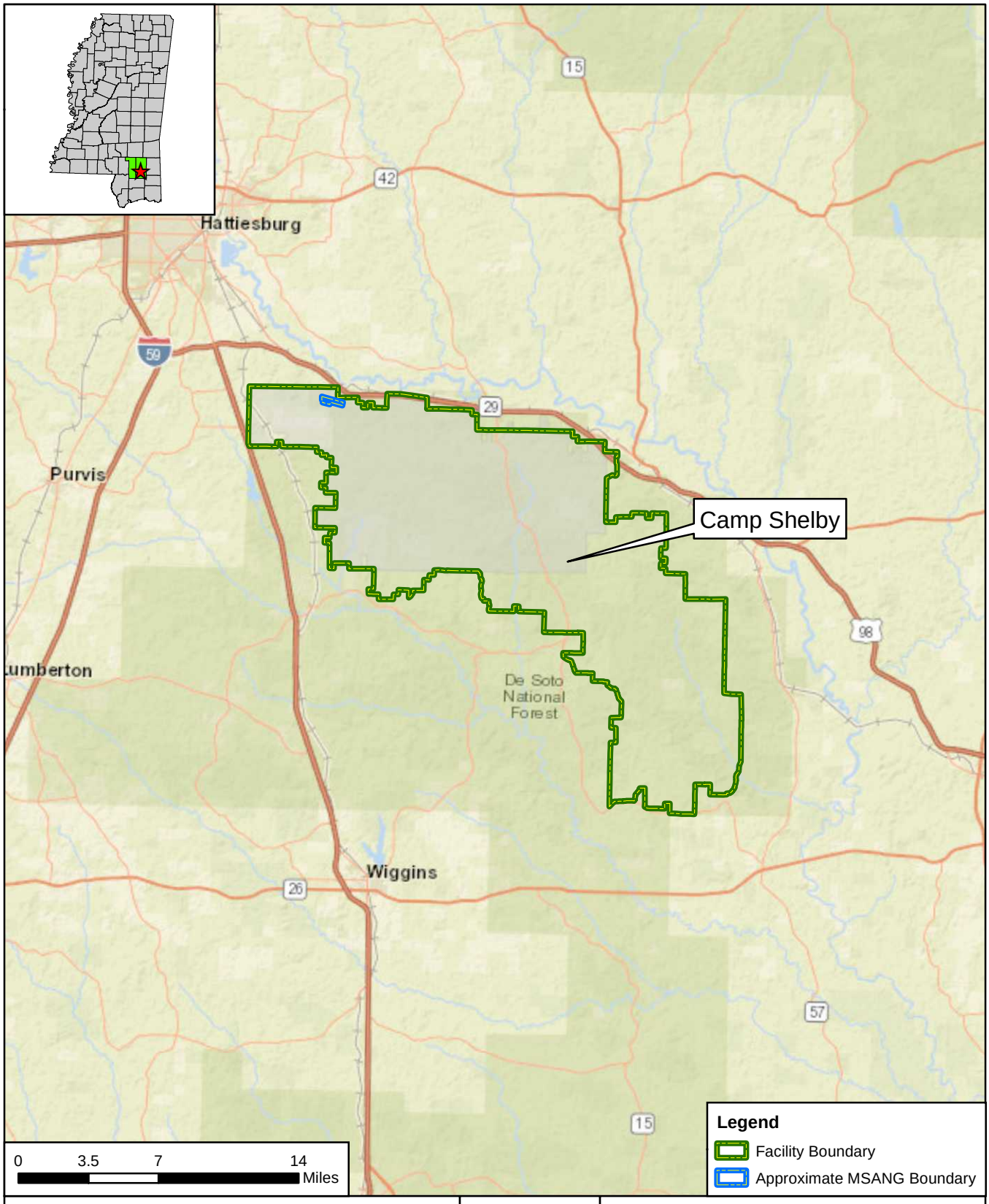

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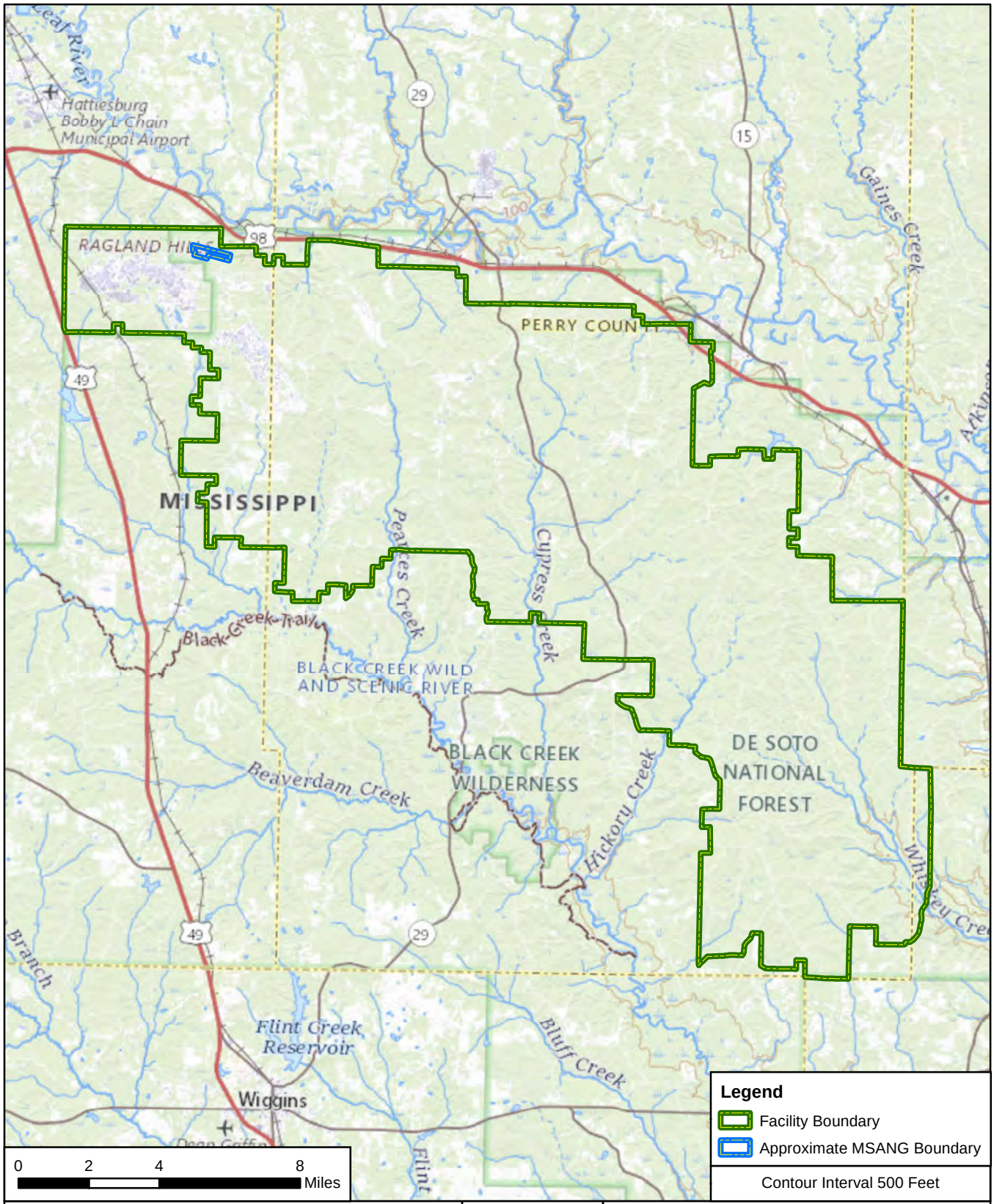
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	CM	11/2/2022

N

Facility Location

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 2-1



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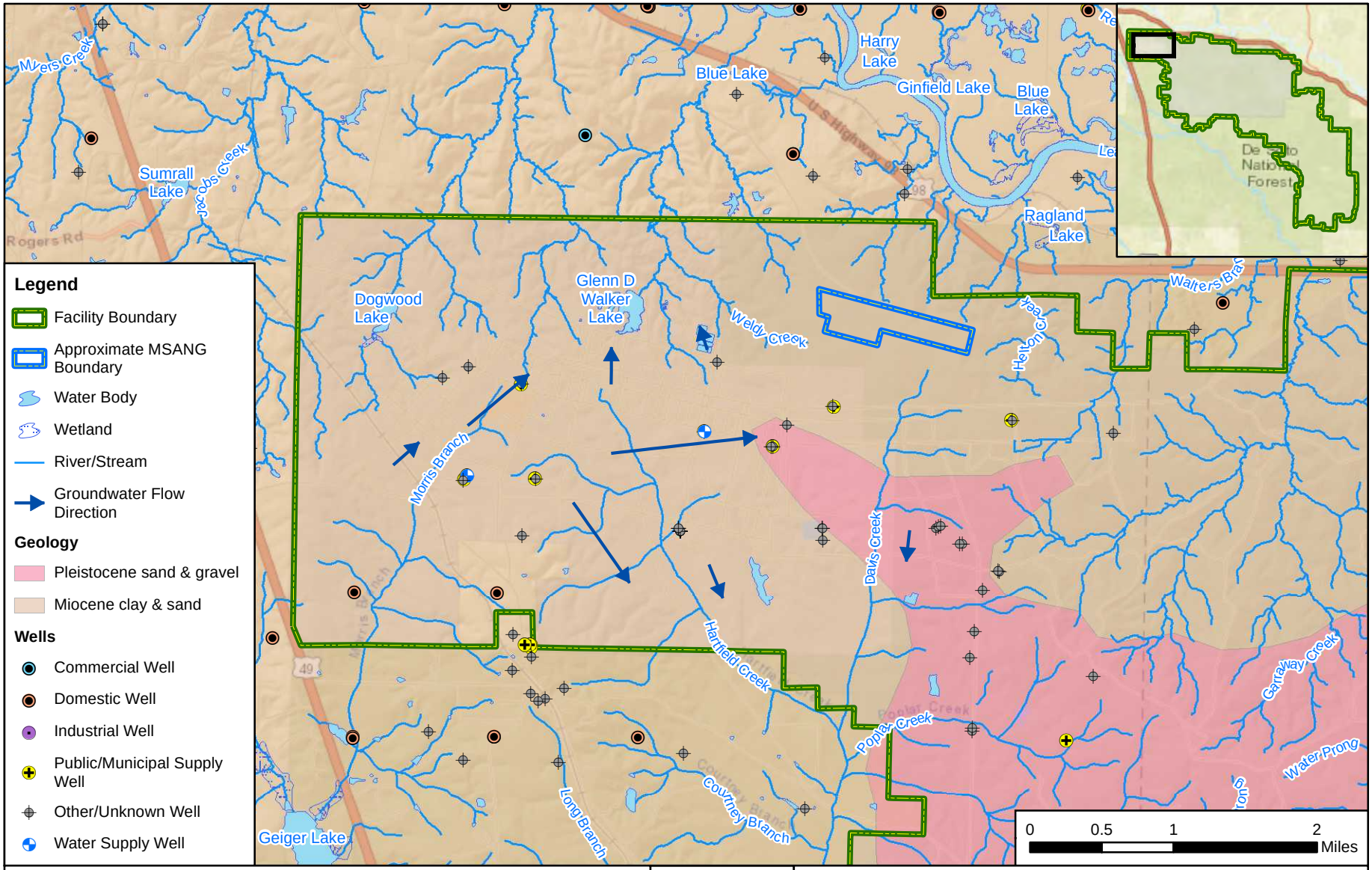
Base Map: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program,		PM	CM	1/3/2023

Facility Topography

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 2-2



CLIENT	ARNG			
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Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	11/2/2022

Groundwater Features

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 2-3

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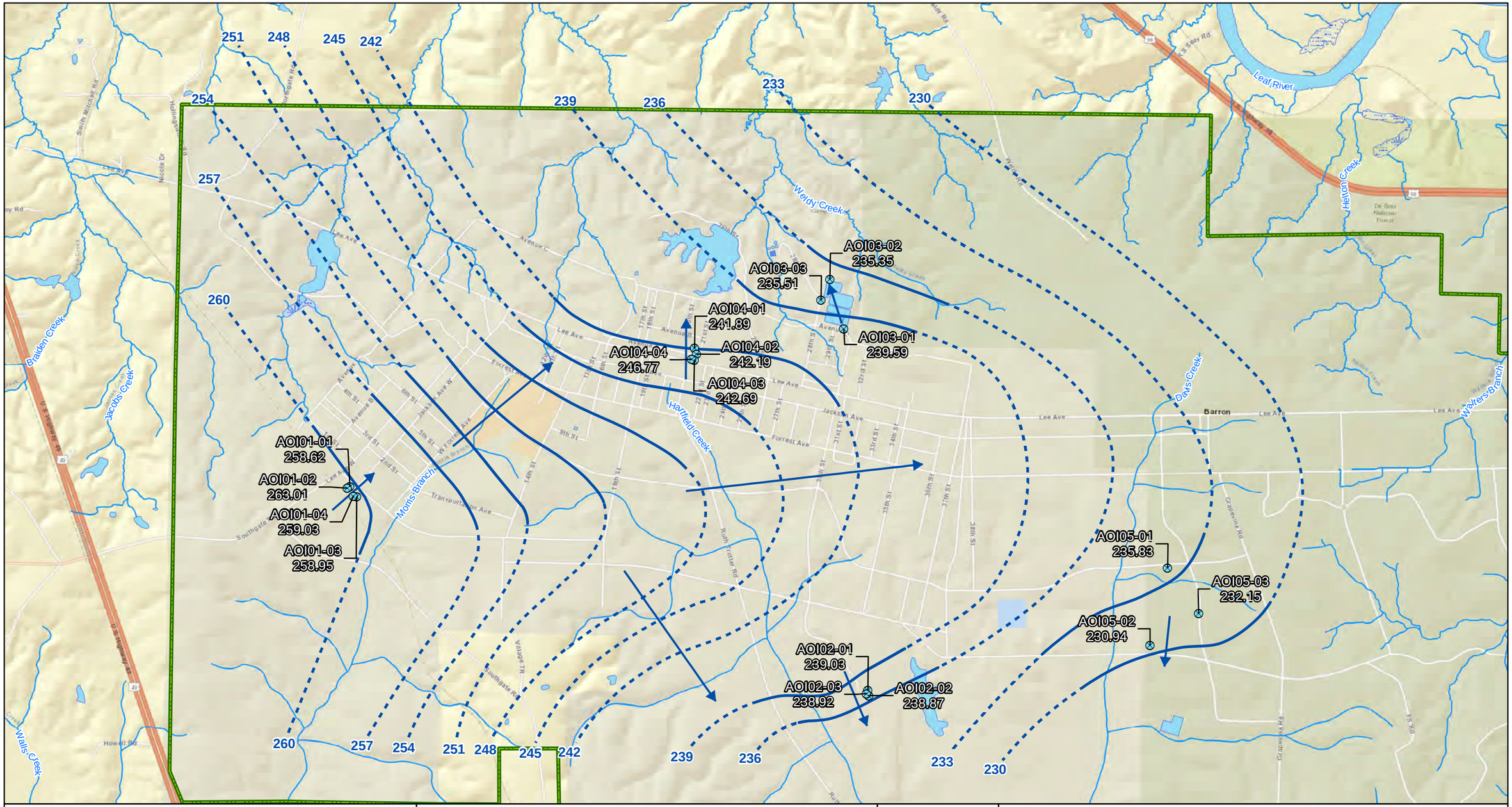

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
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SCALE	1:26,400	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	1/3/2023

- Soil Boring
- Facility Boundary
- Water Body
- Wetland
- River/Stream
- Groundwater Elevation Contour
- Inferred Groundwater Elevation Contour
- Groundwater Flow Direction

0 1,100 2,200 4,400 Feet

Groundwater elevations in ft NAVD88.

N

Groundwater Elevations, May 2022

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Figure 2-4

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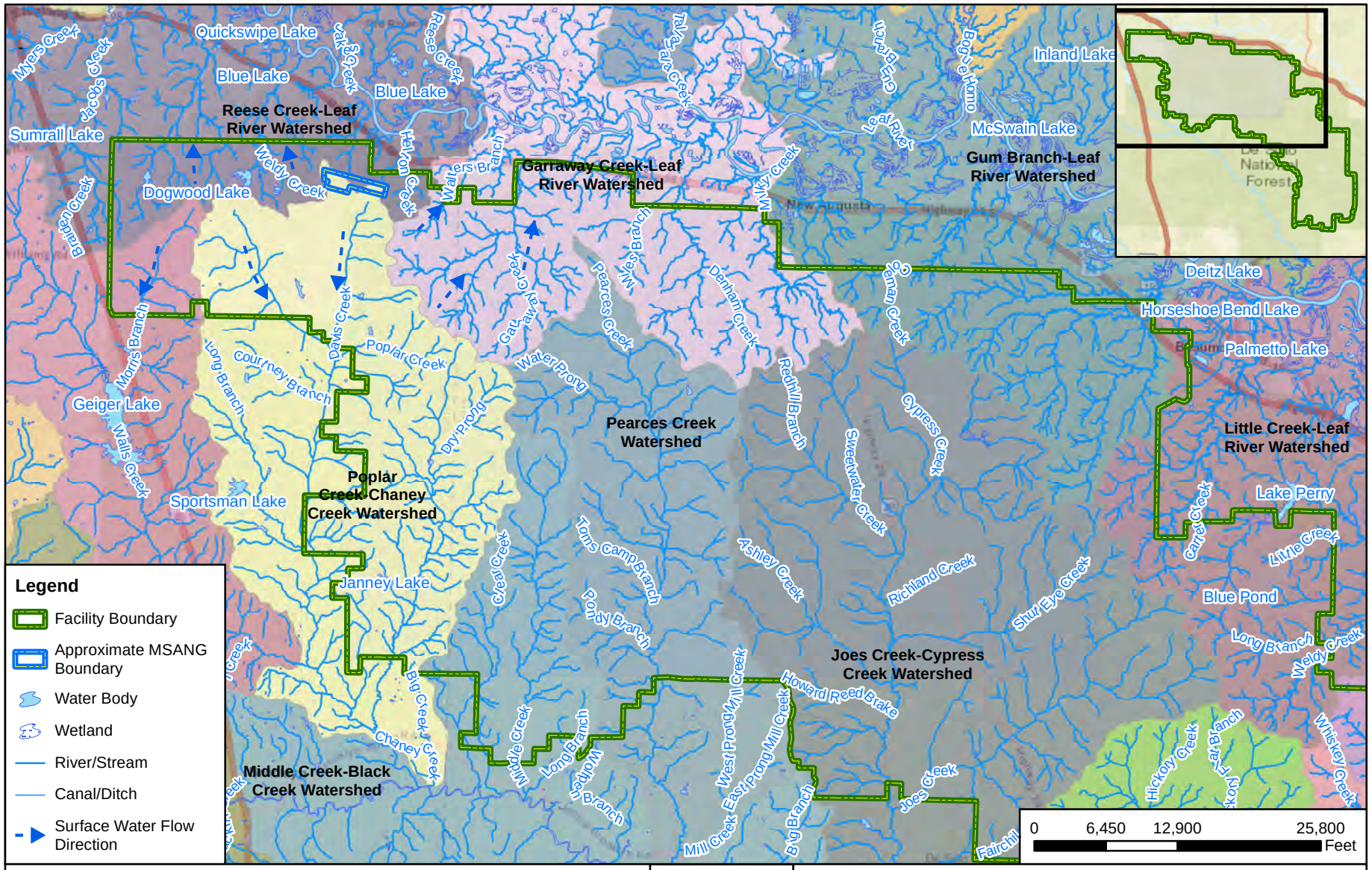

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PROJECT	Site Inspection at Camp Shelby, MS			
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SCALE	1:154,800	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	1/3/2023

Surface Water Features

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Germantown, MD 20876

Figure 2-5

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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, four potential release areas were identified at Camp Shelby and grouped into three AOIs (AECOM, 2020). Three additional potential release areas were identified after the PA. The seven total release areas evaluated under the SI were grouped into five AOIs, as described below. The potential release areas are shown on **Figure 3-1**.

3.1 AOI 1 Release Areas A & F

3.1.1 Release Area A

Release Area A is the Old Fire Station and is located on the southwestern end of the facility. According to aerial imagery, the Old Fire Station has been demolished within the last 6 years (Google LLC, 2021). According to interviews with site personnel, the Old Fire Station had floor drains that led to the storm sewer system. It was reported that bulk AFFF was stored in 5-gallon buckets at the station during its operation.

According to the former Fire Inspector and Emergency Services Coordinator and the current Fire Chief, the Old Fire Station housed one firetruck that held between 150 to 200 gallons of AFFF until 2004. Enough AFFF 5-gallon buckets were stored at the station to be able to refill the truck. There were no reported historical releases or spills of AFFF at the area, but there is uncertainty given the regular handling of AFFF that reportedly occurred. Nozzle testing was performed with water.

During the Visual Site Inspection (VSI), a storm drain was noted in the corner of the parking lot adjacent to the footprint of the former building, as well as a cement-lined drainage ditch. Storm drains in the vicinity of the Old Fire Station discharge to an unnamed tributary to Geiger Lake (MSARNG, 2017).

AFFF was handled regularly at the station, and there is the potential for historical releases of AFFF to have occurred until firefighting operations moved out of the building in 2004. The Old Fire Station is located in the cantonment area. No remediation activities have occurred at AOI 1.

3.1.2 Release Area F

Release Area F is the Warehouse – Building 6519 and is also located on the southwestern end of the facility, near the Old Fire Station. During the VSI, a stock of 5-gallon buckets of Vulcan and Ansulite® 3% AFFF was noted in the Warehouse; approximately 675 gallons total were observed. There was no evidence of leaks or spills noted during the VSI, and drains were not present in the building. The building has a wooden floor, which is elevated about 3 feet above ground surface. Site personnel reported no knowledge of leaks or spills of AFFF in the Warehouse from at least 1985 to present. Release Area F was added after the PA, once the program started including AFFF storage areas as potential release areas. Release Area F was grouped with Release Area A into AOI 1 due to proximity.

3.2 AOI 2 Release Area B

Release Area B is the Old Hagler Airfield Fire Station and is located on the southern end of the facility, at the Hagler Airfield. According to aerial imagery, the building was expanded between 1996 and 2004. According to the former Fire Inspector and Emergency Services Coordinator and the current Fire Chief, the Old Hagler Airfield Fire Station housed two emergency response

vehicles that stored AFFF until 2004. These trucks reportedly never leaked, and nozzle testing with AFFF did not occur, but the trucks likely contained AFFF for readiness purposes. There were no reported historical releases or spills of AFFF, but there is uncertainty regarding the handling of AFFF while filling the trucks. Storm drains at the Old Hagler Airfield Fire Station lead to Hartfield Creek (MASRNG, 2017).

The Old Hagler Airfield Fire Station now functions as an operations and drone hangar building. During the VSI, seven Halon fire extinguishers were noted on the drone flight line adjacent to the building. No AFFF was present in the building during the VSI.

AFFF was handled regularly at the station, and there is the potential for historical releases of AFFF to have occurred prior to firefighting operations moving out of the building in 2004. The Old Hagler Airfield Fire Station is located on the southern end of the facility, adjacent to the Hagler Airfield.

Releases at AOI 2 may have occurred on both paved areas and grassy surfaces. Some AFFF releases may have occurred directly onto surface soil but may also have infiltrated to subsurface soil via cracks in pavement or joints between areas that are paved with different materials. Surface water flows into the stream and creeks downgradient of the AOI.

3.3 AOI 3 Release Areas C & D

The wastewater treatment plant (WWTP) is located on the north end of the cantonment area. Prior to 2008, the WWTP was a Class IV system with sludge drying beds (Release Area C). After 2008, the current WWTP, which is a Class II aerated system, began operating (Release Area D). The Class II WWTP does not have a sequential batch reactor system. After 2008, sludge was no longer produced by the WWTP. The Class II system currently discharges to the Leaf River after treatment, while the old Class IV system historically discharged to a tributary to Weldy Creek. The facility does not use the WWTP effluent or reclaimed water for irrigation/land application.

The 2016 MSANG PA (BB&E, 2016) report, which included the MSANG Release Area 1 at Camp Shelby, noted that releases of AFFF have occurred consistently via Aircraft Rescue and Firefighting (ARFF) vehicle washing inside the MSANG Release Area 1 Fire Station. These releases entered the floor drains and went to the oil water separator (OWS). Beginning in 2011, the OWS was diverted to the Camp Shelby sanitary sewer system, which leads to the WWTP.

There is the likelihood that documented AFFF releases at the adjacent MSANG Release Area 1 have been directed to the current Class II WWTP. Due to uncertainty surrounding AFFF handling at Camp Shelby, there is the potential for AFFF to have entered the original Camp Shelby Class IV WWTP and associated sludge beds (Release Area C).

PFAS in shallow groundwater would flow to the north, consistent with the assumed groundwater gradient in this area of the facility, and eventually discharge to either Weldy Creek or a tributary to Weldy Creek, as most creeks and streams in this area are gaining streams. The WWTP historically discharged effluent, which could have potentially contained PFAS, to a tributary of Weldy Creek. The current system (Release Area D) discharges effluent to the Leaf River. The facility has not removed any biosolids since construction. Additionally, biosolids or biosolid-derived fertilizer is not used at the facility.

3.4 AOI 4 Release Area E

Release Area E is the Current Fire Station is located on the north end of the facility. According to aerial imagery, the Current Fire Station was built between 2012 and 2013. There have been no reported AFFF releases at the building. During the VSI in March 2019, two 5-gallon buckets of

AFFF were noted in storage on one of the firetrucks. Personnel at the station reported no knowledge of AFFF releases during the entirety of the Current Fire Station's existence. Release Area E was added after the PA, once the program started including AFFF storage areas as potential release areas.

3.5 AOI 5 Release Area G

Release Area G is the Old Sanitary Landfill. According to the facility Environmental Impact Statement (Weatherford McDade, Ltd., 1991) and facility personnel, the sanitary landfill was constructed prior to the 1980's and was permitted to accept solid waste refuse from the main WWTP since 1981. The landfill trenches received refuse compacted into 1-foot layers and covered with soil. WWTP sludge was placed in the Old Sanitary Landfill prior to the landfill closing in the early 1990s. After the early 1990s, the sludge was taken offsite from Camp Shelby for disposal. A drainage ditch conveys runoff around the sides of the landfill to the west side and then to an outlet ditch that drains into Davis Creek (**Figure 2-5**) (Weatherford McDade, Ltd., 1991). Release Area G was added after the PA, once additional historical documents were identified and indicated it may be a secondary release area.

3.6 Adjacent Sources

One potential source was identified within the cantonment area of Camp Shelby during the PA and is not associated with ARNG activities. The adjacent potential source is shown on **Figure 3-1** and described in the following sections for informational purposes only and will not be investigated as part of this SI.

3.6.1 MSANG Release Area 1

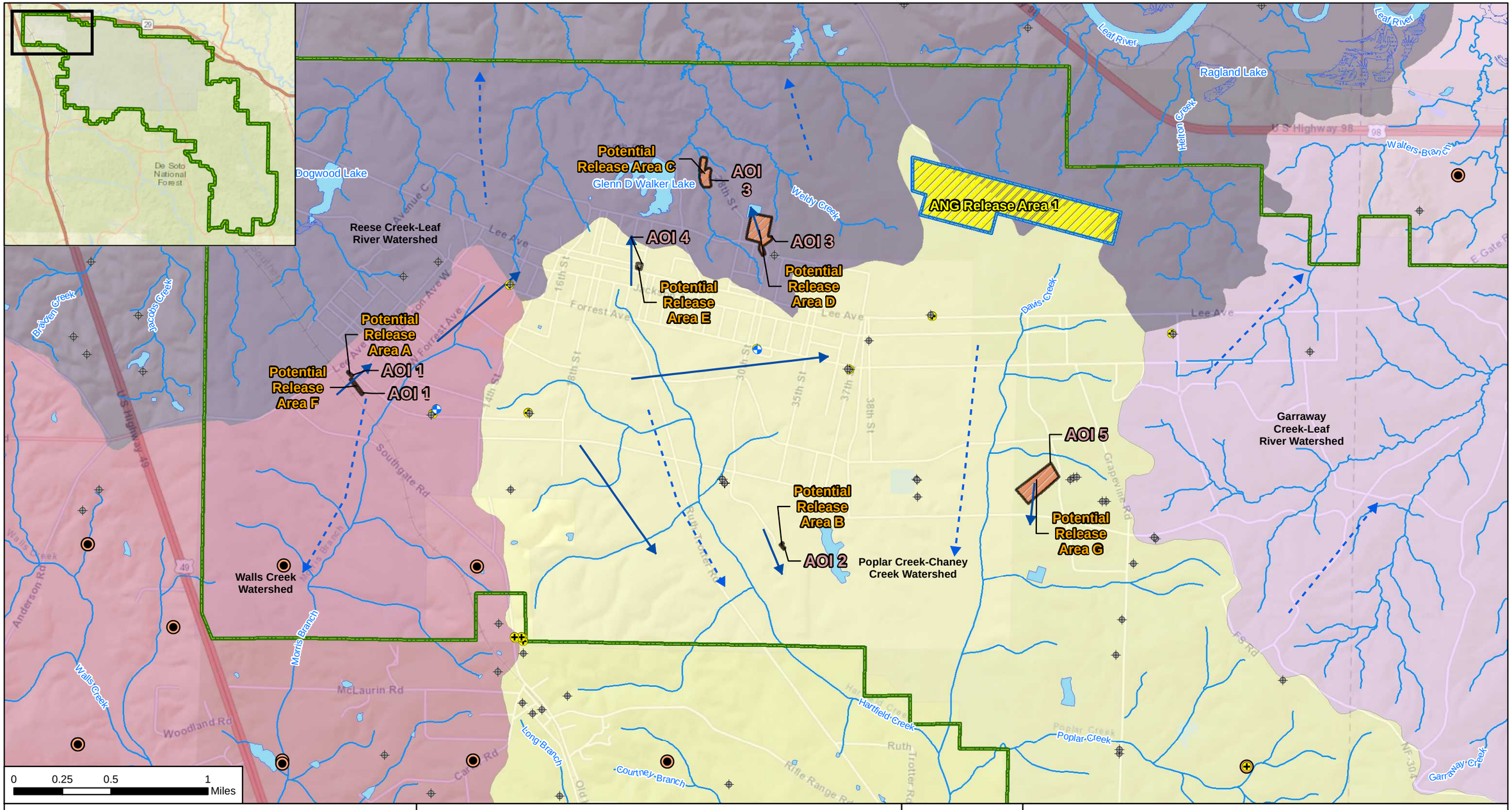
The MSANG Release Area 1 is the C-17 Assault Strip is a 210-acre area operated by the MSANG and owned by the US Air Force. This parcel of MSANG land is located in the northeast part of the cantonment area of Camp Shelby (which is in the northwest corner of the installation) and consists of an airstrip and associated Fire Station.

The Fire Station at the MSANG Release Area 1 became active in 2007. AFFF is used in the ARFF vehicles. During a PA in 2016, two P-19 vehicles and a foam-carrying trailer were present at the station (BB&E, 2016). The vehicles each carried 130 gallons of AFFF, and the foam trailer carried 1,000 gallons of AFFF. ARFF vehicles are washed consistently inside the MSANG Release Area 1 Fire Station or on the ramp on the north side of the building. Floor drains inside the station lead to an OWS and subsequently to the Camp Shelby sanitary sewer system, which leads to the current WWTP (Release Area D). Since 2008, the WWTP has been discharging effluent to the Leaf River; therefore, potential releases to the MSANG Release Area 1 OWS may have entered the Camp Shelby WWTP and eventually discharged to the Leaf River. Prior to 2011, the floor drains led to a leach field to the east of the building.

MSANG personnel also remembered seeing foam once in front of the station either from nozzle testing or a leak. Personnel also reported occasional leaks from the ARFF vehicles within the station, which would have been left to dissipate. Stormwater drainage at the MSANG Release Area 1 is directed through grass and cement-lined ditches and eventually discharges to the south towards Camp Shelby property. The 2016 PA report made the recommendation to proceed to an SI focusing on soil, groundwater, surface water, and sediment at the MSANG Release Area 1 (BB&E, 2016).

AFFF entering stormwater drains via ditches to the south would likely discharge to Davis Creek or another surface water feature on Camp Shelby property. AFFF in shallow groundwater from the leach field would also likely flow to the south, toward Davis Creek. However, given the pattern

of radial surface water drainage around the MSANG Release Area 1, the groundwater divide likely passes underneath the area; therefore, shallow groundwater flow in other directions is possible.



CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	11/2/2022	GIS BY	MS	11/2/2022
SCALE	1:31,680	CHK BY	JH	11/2/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	11/2/2022

- Area of Interest
- Potential Release
- Known Release Area from ANG SI
- Facility Boundary
- Approximate MSANG Boundary
- Water Body
- Wetland
- River/Stream
- Surface Water Flow Direction
- Groundwater Flow Direction
- Domestic Well
- Public/Municipal Supply Well
- Water Supply Well
- Other/Unknown Well

N

Areas of Interest

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Figure 3-1

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4. Project Data Quality Objectives

As identified during the Data Quality Objective (DQO) process and outlined in the SI Quality Assurance Project Plan (QAPP) Addendum (AECOM, 2022a), the objective of the SI is to identify whether there has been a release to the environment at the AOIs 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 presence or absence of relevant compounds at each of the sampled AOIs.

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 included:

- The PA for Camp Shelby (AECOM, 2020);
- The PA for the MSANG C-17 Assault Strip at Camp Shelby (BB&E, 2016);
- Analytical data from groundwater and soil samples collected as part of this SI in accordance with the site-specific Uniform Federal Policy (UFP)-QAPP Addendum (AECOM, 2022a); 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 by the property limits of the facility (**Figure 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 SI scope was bounded vertically by the observed depths of the surficial groundwater table. Temporal boundaries were not limited by seasonal conditions, but late spring was the earliest available time field resources were available to complete the study.

4.4 Analytical Approach

Samples were analyzed by Pace Analytical Gulf Coast, accredited under the DoD Environmental Laboratory Accreditation Program (ELAP; Accreditation Number 74960) and the National Environmental Laboratory Accreditation Program (NELAP; Certificate Number 01955). Data were compared to applicable SLs within this document and decision rules as defined in the SI QAPP Addendum (AECOM, 2022a).

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 SI QAPP Addendum (AECOM, 2022a).

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 implemented in accordance with the following approved documents:

- *Final Site Inspection Programmatic Uniform Federal Policy-Quality Assurance Project Plan (PQAPP)* dated March 2018 (AECOM, 2018a);
- *Final Programmatic Accident Prevention Plan* dated July 2018 (AECOM, 2018b);
- *Final Preliminary Assessment Report, Camp Shelby Joint Forces Training Center, Mississippi* dated September 2020 (AECOM, 2020);
- *Final Site Inspection Uniform Federal Policy-Quality Assurance Project Plan Addendum, Camp Shelby Joint Forces Training Center, Mississippi,* dated May 2022 (AECOM, 2022a); and
- *Final Site Safety and Health Plan, Camp Shelby Joint Forces Training Center, Mississippi,* dated May 2022 (AECOM, 2022b).

The SI field activities were conducted from 23 to 27 May 2022 and consisted of utility clearance, direct push boring, soil sample collection, temporary monitoring well installation and abandonment, grab groundwater sample collection, and land surveying. Field activities were conducted in accordance with the SI QAPP Addendum (AECOM, 2022a), except as noted in **Section 5.8**.

The following samples were collected during the SI and analyzed for a subset of 18 compounds by liquid chromatography with tandem mass spectrometry (LC/MS/MS) compliant with Quality Systems Manual (QSM) 5.3 Table B-15 to fulfill the project DQOs:

- Sixty (60) soil samples from 26 boring locations;
- Seventeen (17) grab groundwater samples from 17 temporary well locations;
- Thirty (30) 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 media. 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**, Nonconformance and Corrective Action Reports is provided in **Appendix B3**, and land survey data are provided in **Appendix B4**. Additionally, a photographic log of field activities is provided in **Appendix C**.

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 for each of these activities are presented below.

5.1.1 Technical Project Planning

The USACE TPP Process, Engineer Manual (EM) 200-1-2 (USACE, 2016) 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 AOIs identified in the PA.

A combined TPP Meeting 1 and 2 was held on 22 April 2022, 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 include the ARNG, MSARNG, USACE, and Mississippi Department of Environmental Quality (MDEQ). 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 SI QAPP Addendum (AECOM, 2022a).

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

5.1.2 Utility Clearance

AECOM's drilling subcontractor, Walker-Hill Environmental, Inc. placed a ticket with the Mississippi 811 "One Call" utility clearance provider to notify them of intrusive work. Additionally, AECOM contracted Ground Penetrating Radar Systems, LLC (GPRS), a private utility location service, to perform utility clearance. GPRS performed utility clearance of the proposed boring locations on 23 May 2022, with input from the AECOM field team and Camp Shelby facility staff. General locating services and ground-penetrating radar were used to complete the clearance. Additionally, the first 5 feet of each boring were pre-cleared using a hand auger to verify utility clearance in shallow subsurface where utilities would typically be encountered.

5.1.3 Source Water and Sampling Equipment Acceptability

Two potable water sources at Camp Shelby were sampled on 22 February 2022 to assess usability for decontamination of drilling equipment. CSB-DECON-01 was collected from the spigot behind the Department of Public Works building, and CSB-DECON-02 was collected from the spigot at the Current Fire Station. Results of CSB-DECON-01 confirmed this source to be acceptable for use in this investigation; therefore, the spigot was used throughout the field activities. Specifically, the samples were analyzed by LC/MS/MS compliant with QSM 5.3 Table B-15. The results of the decontamination water sample associated with the MSARNG Environmental Department office building spigot source used 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 sampling environment, except those discussed in **Section 5.8**. The checklist of acceptable materials for use in the sampling environment was provided in the Standard Operating Procedures (SOPs) appendix to the SI QAPP Addendum (AECOM, 2022a). Prior to the start of field work each day, a Sampling Checklist was completed as an additional layer of control. The checklist served as a daily reminder to each field team member regarding the allowable materials within the sampling environment.

5.2 Soil Borings and Soil Sampling

Borings were installed in grass areas, where applicable, to avoid disturbing concrete or asphalt surfaces. Soil samples were collected via direct push technology (DPT), in accordance with the SI QAPP Addendum (AECOM, 2022a). A GeoProbe® 7822DT macrocore 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 of the boring, in accordance with AECOM utility clearance procedures. The soil boring locations are shown on **Figure 5-1**, and depths are provided in **Table 5-1**.

In general, three discrete soil samples were collected from the vadose zone for chemical analysis from each DPT soil boring: one surface soil sample (0 to 2 feet bgs), one subsurface soil sample

approximately 2 feet above the groundwater table, and one subsurface soil sample at the mid-point between the surface and the groundwater table. Additionally, dedicated surface soil samples were collected from 0 to 2 feet bgs using a hand auger.

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

During the SI, low to medium plasticity fines (silts) and sands were observed as the dominant lithology of the unconsolidated sediments below Camp Shelby. The borings were completed at depths between 4 and 40 feet bgs. Surficial soils at the facility were primarily composed of silt and sandy silt. Sand-rich layers ranged in thickness from 1 to 36 feet thick and were observed at depths ranging between 8 and 40 feet bgs. Sand packages were primarily poorly graded, with varying amounts of silt. Well-graded sand was observed at the bottom of some of the borings. Bedding structures observed in the borings included thin (millimeter-thick) laminations within some silt and sand layers. Additionally, a few logs contained medium to high plasticity clay layers between 0.5 and 4 feet thick, with a 26-foot clay layer observed in one boring (AOI03-02). Boring logs are presented in **Appendix E**.

Each soil sample was collected into laboratory-supplied PFAS-free high-density polyethylene (HDPE) bottles 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 by LC/MS/MS compliant with QSM 5.3 Table B-15, total organic carbon (TOC) (USEPA Method 9060A) and pH (USEPA Method 9045D) in accordance with the SI QAPP Addendum (AECOM, 2022a).

Field duplicate samples were collected at a rate of 10% and analyzed for the same parameters as the accompanying samples. Matrix spike (MS) and MS 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, such as a hand auger for the shallow soil samples, equipment rinsate blanks were collected at a rate of 5% and analyzed for the same parameters as the soil samples. A temperature blank was placed in each cooler to ensure that samples were preserved at or below 6 degrees Celsius (°C) during shipment.

DPT borings were converted to temporary wells, which were subsequently abandoned in accordance with the SI QAPP Addendum (AECOM, 2022a) using bentonite chips at completion of sampling activities. Where possible, borings were installed in grass areas to avoid disturbing concrete or asphalt surfaces. Drilling through asphalt was required at AOI01-03, and the top of the borehole was patched with an asphalt cold patch after being backfilled with bentonite chips.

5.3 Temporary Well Installation and Groundwater Grab Sampling

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

Borings AOI03-04 and AOI03-05 were terminated at 4 and 5 feet bgs, respectively, due to hand auger refusal caused by subsurface concrete believed to be part of the old sludge drying beds of the old WWTP (Release Area C). Multiple offset attempts were made at each location in

accordance with the SI QAPP Addendum (AECOM, 2022a); however, refusal was encountered during each attempt. Therefore, no temporary wells were installed at these locations.

Groundwater samples were collected after a period of time following well installation to allow groundwater to infiltrate and recharge the temporary well screen intervals. After the recharge period, groundwater samples were collected using either a peristaltic pump or bladder pump, depending on well depth, with low-density polyethylene (LDPE) 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, turbidity 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. 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. Foaming was observed in grab groundwater samples collected from the following five temporary wells: AOI02-01, AOI02-02, AOI02-03, AOI03-01, and AOI04-03.

Each sample was collected into 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 by LC/MS/MS compliant with QSM 5.3 Table B-15 in accordance with the SI QAPP Addendum (AECOM, 2022a).

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 reagent blank was collected in accordance with the PQAPP (AECOM, 2018a). A temperature blank was placed in each cooler to ensure 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 QAPP Addendum (AECOM, 2022a) by removing the PVC and backfilling the hole with bentonite chips. Drilling through asphalt was only required at one location (AOI01-03). Upon completion of well abandonment at this location, the ground surface was patched with an asphalt cold patch to match existing surrounding conditions.

5.4 Synoptic Water Level Measurements

A synoptic groundwater gauging event was performed on 27 May 2022. Groundwater elevation measurements were collected from the 17 new temporary monitoring wells. Water level measurements were taken from the northern side of the well casing. A groundwater flow contour map is provided in **Figure 2-4**. Groundwater elevation data are provided in **Table 5-2**.

5.5 Surveying

The northern side of each well casing was surveyed by Mississippi-licensed land surveyors following guidelines provided in the SOPs provided in the SI QAPP Addendum (AECOM, 2022a). Survey data from the newly installed wells on the facility were collected on 27 May 2022 in the applicable Universal Transverse Mercator zone projection with Mississippi State Plane-East (horizontal) and North American Vertical Datum 1988 (vertical). The surveyed well data are provided in **Appendix B4**.

5.6 Investigation-Derived Waste

As of the date of this report, the disposal of 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 SI QAPP Addendum (AECOM, 2022a) and with the DA Guidance for Addressing Releases of PFAS, Q18 (DA, 2018).

Soil IDW (i.e., soil cuttings) generated during the SI activities were contained in labeled, 55-gallon Department of Transportation (DOT)-approved steel drums and left onsite in a designated waste storage area. ARNG will coordinate waste profiling, transportation, and disposal of the solid IDW.

Liquid IDW generated during SI activities (i.e., purge water, development water, and decontamination fluids) were contained in labeled, 55-gallon DOT-approved steel drums, and left onsite in a designated waste storage area. Containerized liquid IDW will be characterized, managed, and disposed of by ARNG (either by offsite disposal or onsite disposal with treatment, as appropriate) under a separate contract.

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 5.3 Table B-15 at Pace Analytical Gulf Coast in Baton Rouge, Louisiana, a DoD ELAP and NELAP certified laboratory. Soil samples were also analyzed for TOC using USEPA Method 9060A and pH by USEPA Method 9045D.

5.8 Deviations from SI QAPP Addendum

Four deviations from the SI QAPP Addendum were identified and are noted below.

- As discussed in **Section 5.3**, refusal was encountered at borings AOI03-04 and AOI03-05 prior to the installation of the temporary wells. Multiple offset attempts were made at each location in accordance with the SI QAPP Addendum (AECOM, 2022a); however, refusal was encountered during each attempt. Therefore, no temporary wells were installed at these locations.
- During DPT drilling activities at boring AOI03-03, the midpoint subsurface soil sample was collected at a depth below 15 feet bgs (16 to 18 feet bgs). The approved SI QAPP Addendum states that mid-point subsurface soil samples would be collected from 13 to 15 feet bgs if the total boring depth exceeded 30 feet bgs. The total boring depth of AOI03-03 was 40 feet, and the mid-point samples were inadvertently collected at depths greater than 15 feet bgs. The deviation is documented in a nonconformance and corrective action report (**Appendix B3**).
- LDPE tubing was provided by our sampling equipment supplier instead of the SI QAPP Addendum-approved HPDE tubing. Consequently, LDPE tubing was used for collection of groundwater samples. Field personnel collected an equipment rinsate blank (ERB) through a sample of the LDPE tubing to test against the possibility of cross-contamination (CSB-ERB-07). All relevant compounds were non-detect in the sample, indicating cross-contamination was unlikely. Results from QC samples are presented in **Appendix F**. The deviation is documented in a nonconformance and corrective action report (**Appendix B3**).
- Due to a laboratory error, the grain size sample collected at location AOI04-04 could not be analyzed. The deviation is documented in a nonconformance and corrective action report (**Appendix B3**).

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Table 5-1
Site Inspection Samples by Medium
Site Inspection Report, Camp Shelby Joint Forces Training Center, Mississippi

Sample Identification	Sample Collection Date/Time	Sample Depth (feet bgs)	PFAS by LC/MS/MS compliant with QSM 5.3 Table B-15	TOC (USEPA Method 9060A)	pH (USEPA Method 9045D)	Grain Size (ASTM D-422)	Comments
Soil Samples							
AOI01-01-SB-00-02	5/26/2022 9:37	0 - 2	x				
AOI01-01-SB-09-11	5/26/2022 10:42	9 - 11	x				
AOI01-01-SB-18-20	5/26/2022 10:38	18 - 20	x				
AOI01-02-SB-00-02	5/26/2022 12:02	0 - 2	x				
AOI01-02-SB-05-07	5/26/2022 13:32	5 - 7	x				
AOI01-02-SB-10-12	5/26/2022 13:40	10 - 12	x				
AOI01-03-SB-00-02	5/26/2022 16:37	0 - 2	x				
AOI01-03-SB-06-08	5/26/2022 17:20	6 - 8	x				
AOI01-03-SB-14-16	5/26/2022 17:15	14 - 16	x				
AOI01-03-SB-14-16-D	5/26/2022 17:15	14 - 16	x				FD
AOI01-04-SB-00-02	5/26/2022 15:30	0 - 2	x	x	x		
AOI01-04-SB-00-02-D	5/26/2022 15:30	0 - 2	x	x	x		FD
AOI01-04-SB-8.5-10.5	5/26/2022 15:25	8.5 - 10.5	x				
AOI01-04-SB-8.5-10.5-MS	5/26/2022 15:25	8.5 - 10.5	x				MS
AOI01-04-SB-8.5-10.5-MSD	5/26/2022 15:25	8.5 - 10.5	x				MSD
AOI01-04-SB-19-21	5/26/2022 15:36	19 - 21	x				
AOI01-05-SB-00-02	5/26/2022 19:15	0 - 2	x				
AOI01-06-SB-00-02	5/26/2022 9:30	0 - 2	x				
AOI01-07-SB-00-02	5/26/2022 10:50	0 - 2	x				
AOI02-01-SB-00-02	5/25/2022 8:40	0 - 2	x				
AOI02-01-SB-13-15	5/25/2022 9:30	13 - 15	x				
AOI02-01-SB-22-24	5/25/2022 9:35	22 - 24	x				
AOI02-02-SB-00-02	5/25/2022 12:00	0 - 2	x				
AOI02-02-SB-00-02-D	5/25/2022 12:00	0 - 2	x				FD
AOI02-02-SB-13-15	5/25/2022 12:15	13 - 15	x				
AOI02-02-SB-22-24	5/25/2022 12:25	22 - 24	x				
AOI02-03-SB-00-02	5/25/2022 10:00	0 - 2	x				
AOI02-03-SB-13-15	5/25/2022 10:25	13 - 15	x	x	x		
AOI02-03-SB-13-15-MS	5/25/2022 10:25	13 - 15	x				MS
AOI02-03-SB-13-15-MSD	5/25/2022 10:25	13 - 15	x				MSD
AOI02-03-SB-22-24	5/25/2022 10:45	22 - 24	x				
AOI02-04-SB-00-02	5/25/2022 9:10	0 - 2	x				
AOI02-05-SB-00-02	5/25/2022 9:45	0 - 2	x				
AOI03-01-SB-00-02	5/26/2022 10:15	0 - 2	x				
AOI03-01-SB-00-02-MS	5/26/2022 10:15	0 - 2	x				MS
AOI03-01-SB-00-02-MSD	5/26/2022 10:15	0 - 2	x				MSD
AOI03-01-SB-14-16	5/26/2022 11:10	14 - 16	x				
AOI03-01-SB-14-16-D	5/26/2022 11:10	14 - 16	x				FD
AOI03-01-SB-28-30	5/26/2022 11:15	28 - 30	x				
AOI03-02-SB-00-02	5/26/2022 15:00	0 -2	x				
AOI03-02-SB-14-16	5/26/2022 15:45	14 - 16	x				
AOI03-02-SB-32-34	5/26/2022 15:50	32 - 34	x				
AOI03-03-SB-00-02	5/25/2022 14:00	0 - 2	x	x	x		
AOI03-03-SB-16-18	5/26/2022 9:30	16 - 18	x				
AOI03-03-SB-33-35	5/26/2022 9:40	33 - 35	x				

Table 5-1
Site Inspection Samples by Medium
Site Inspection Report, Camp Shelby Joint Forces Training Center, Mississippi

Sample Identification	Sample Collection Date/Time	Sample Depth (feet bgs)	PFAS by LC/MS/MS compliant with QSM 5.3 Table B-15	TOC (USEPA Method 9060A)	pH (USEPA Method 9045D)	Grain Size (ASTM D-422)	Comments
AOI03-04-SB-00-02	5/26/2022 12:00	0 - 2	x				
AOI03-05-SB-00-02	5/26/2022 13:15	0 - 2	x				
AOI03-06-SB-00-1.2	5/27/2022 13:40	0 - 1.2	x				
AOI03-07-SB-00-02	5/27/2022 10:30	0 - 2	x				
AOI03-07-SB-00-02-D	5/27/2022 10:30	0 - 2	x				FD
AOI04-01-SB-00-02	5/24/2022 15:05	0 - 2	x				
AOI04-01-SB-13-15	5/24/2022 15:40	13 - 15	x				
AOI04-01-SB-28-30	5/24/2022 15:45	28 - 30	x				
AOI04-02-SB-00-02	5/24/2022 13:30	0 - 2	x				
AOI04-02-SB-13-15	5/24/2022 14:15	13 - 15	x				
AOI04-02-SB-30-32	5/24/2022 14:20	30 - 32	x				
AOI04-03-SB-00-02	5/24/2022 12:00	0 - 2	x				
AOI04-03-SB-00-02-D	5/24/2022 12:00	0 - 2	x				FD
AOI04-03-SB-13-15	5/24/2022 13:05	13 - 15	x				
AOI04-03-SB-30-32	5/24/2022 13:10	30 - 32	x				
AOI04-04-SB-00-02	5/24/2022 11:05	0 - 2	x	x	x		
AOI04-04-SB-00-02-MS	5/24/2022 11:05	0 - 2		x	x		MS
AOI04-04-SB-00-02-MSD	5/24/2022 11:05	0 - 2		x	x		MSD
AOI04-04-SB-13-15	5/24/2022 11:30	13 - 15	x				
AOI04-04-SB-20-21	5/24/2022 11:40	20 - 21				x	
AOI04-04-SB-28-30	5/24/2022 11:35	28 - 30	x				
AOI05-01-SB-00-02	5/24/2022 8:00	0 - 2	x				
AOI05-01-SB-00-02-MS	5/24/2022 8:00	0 - 2	x				MS
AOI05-01-SB-00-02-MSD	5/24/2022 8:00	0 - 2	x				MSD
AOI05-01-SB-06-08	5/24/2022 8:40	6 - 8	x				
AOI05-01-SB-14-16	5/24/2022 8:45	14 - 16	x				
AOI05-02-SB-00-02	5/23/2022 15:30	0 - 2	x	x	x		
AOI05-02-SB-05-07	5/23/2022 15:45	5 - 7	x				
AOI05-02-SB-07-09	5/23/2022 15:40	7 - 9	x				
AOI05-03-SB-00-02	5/23/2022 13:15	0 - 2	x				
AOI05-03-SB-00-02-D	5/23/2022 13:15	0 - 2	x				FD
AOI05-03-SB-13-15	5/23/2022 14:00	13 - 15	x				
AOI05-03-SB-28-30	5/23/2022 14:30	28 - 30	x				
Groundwater Samples							
AOI01-01-GW	5/26/2022 12:30	NA	x				
AOI01-01-GW-D	5/26/2022 12:30	NA	x				FD
AOI01-01-GW-MS	5/26/2022 12:30	NA	x				MS
AOI01-01-GW-MSD	5/26/2022 12:30	NA	x				MSD
AOI01-02-GW	5/26/2022 14:15	NA	x				
AOI01-03-GW	5/27/2022 7:40	NA	x				
AOI01-04-GW	5/26/2022 17:05	NA	x				
AOI02-01-GW	5/26/2022 13:15	NA	x				

Table 5-1
Site Inspection Samples by Medium
Site Inspection Report, Camp Shelby Joint Forces Training Center, Mississippi

Sample Identification	Sample Collection Date/Time	Sample Depth (feet bgs)	PFAS by LC/MS/MS compliant with QSM 5.3 Table B-15	TOC (USEPA Method 9060A)	pH (USEPA Method 9045D)	Grain Size (ASTM D-422)	Comments
AOI02-02-GW	5/26/2022 14:25	NA	x				
AOI02-03-GW	5/26/2022 15:40	NA	x				
AOI03-01-GW	5/27/2022 12:30	NA	x				
AOI03-02-GW	5/27/2022 9:50	NA	x				
AOI03-03-GW	5/27/2022 11:05	NA	x				
AOI04-01-GW	5/27/2022 13:35	NA	x				
AOI04-02-GW	5/27/2022 13:00	NA	x				
AOI04-03-GW	5/27/2022 13:45	NA	x				
AOI04-04-GW	5/27/2022 12:07	NA	x				
AOI05-01-GW	5/26/2022 11:40	NA	x				
AOI05-01-GW-D	5/26/2022 11:40	NA	x				FD
AOI05-02-GW	5/25/2022 11:50	NA	x				
AOI05-03-GW	5/27/2022 15:15	NA	x				
Quality Control Samples							
CSB-FRB-01	5/27/2022 14:25	NA	x				
CSB-ERB-01	5/26/2022 9:30	NA	x				Off AECOM hand auger
CSB-ERB-02	5/26/2022 14:40	NA	x				Off AECOM hand auger*
CSB-ERB-03	5/26/2022 14:50	NA	x				Off driller's hand auger*
CSB-ERB-04	5/26/2022 15:15	NA	x				Off rig cutting shoe*
CSB-ERB-05	5/27/2022 13:00	NA	x				Off driller's hand auger
CSB-ERB-06	5/27/2022 13:05	NA	x				Off rig cutting shoe
CSB-ERB-07	5/27/2022 14:30	NA	x				Off LDPE tubing
CSB-DECON-01	2/23/2022 15:17	NA	x				From spigot at DPW Bldg 6530
CSB-DECON-02	2/23/2022 15:40	NA	x				From spigot at New Fire Station
CSB-DECON-03	5/26/2022 18:00	NA	x				Off rig* decontamination system

Notes:
*Indicates equipment used in the Gulfport AVCRAD SI field event that was mobilized to Camp Shelby.

ASTM = American Society for Testing and Materials
bgs = below ground surface
ERB = equipment rinsate blank
FD = field duplicate
FRB = field reagent blank
LC/MS/MS = Liquid Chromatography Mass Spectrometry
MS/MSD = matrix spike/ matrix spike duplicate
PFAS = per- and polyfluoroalkyl substances
QSM = Quality Systems Manual
TOC = total organic carbon
USEPA = United States Environmental Protection Agency

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Table 5-2
Soil Boring Depths, Temporary Well Screen Intervals, and Groundwater Elevations
Site Inspection Report, Camp Shelby Joint Forces Training Center, Mississippi

Area of Interest	Boring Location	Soil Boring Depth (feet bgs)	Temporary Well Screen Interval (feet bgs)	Top of Casing Elevation (feet NAVD88)	Ground Surface Elevation (feet NAVD88)	Depth to Water (feet btoc)	Depth to Water (feet bgs)	Groundwater Elevation (feet NAVD88)
1	AOI01-01	24	19 - 24	275.63	274.79	17.01	16.17	258.62
	AOI01-02	16	11 - 16	277.70	273.57	14.69	10.56	263.01
	AOI01-03	22	17 - 22	278.14	275.36	19.19	16.41	258.95
	AOI01-04	25	20 - 25	276.60	275.46	17.57	16.43	259.03
2	AOI02-01	28	23 - 28	264.42	262.52	25.39	23.49	239.03
	AOI02-02	28	23 - 28	264.16	262.29	25.29	23.42	238.87
	AOI02-03	28	23 - 28	264.48	262.11	25.56	23.19	238.92
3	AOI03-01	36	29 - 34	271.35	270.20	31.76	30.61	239.59
	AOI03-02	40	35 - 40	271.05	270.80	35.70	35.45	235.35
	AOI03-03	40	35 - 40	271.26	271.01	35.75	35.50	235.51
	AOI03-04[1]	4	NA	NA	NA	NA	NA	NA
	AOI03-05[1]	5	NA	NA	NA	NA	NA	NA
4	AOI04-01	32	27 - 32	274.62	271.26	32.73	29.37	241.89
	AOI04-02	36	31 - 36	276.08	275.51	33.89	33.32	242.19
	AOI04-03	36	31 - 36	276.42	275.04	33.73	32.35	242.69
	AOI04-04	37	32 - 37	276.31	275.28	29.54	28.51	246.77
5	AOI05-01	25	20 - 25	251.83	251.04	16.00	15.21	235.83
	AOI05-02	21	16 - 21	240.51	239.86	9.57	8.92	230.94
	AOI05-03	37	32 - 37	266.02	261.74	33.87	29.59	232.15

Notes:
1. Boring terminated prior to encountering groundwater due to refusal from encountering buried concrete structures.

bgs = below ground surface
btoc = below top of casing
NA = not applicable
NAVD88 = North American Vertical Datum 1988

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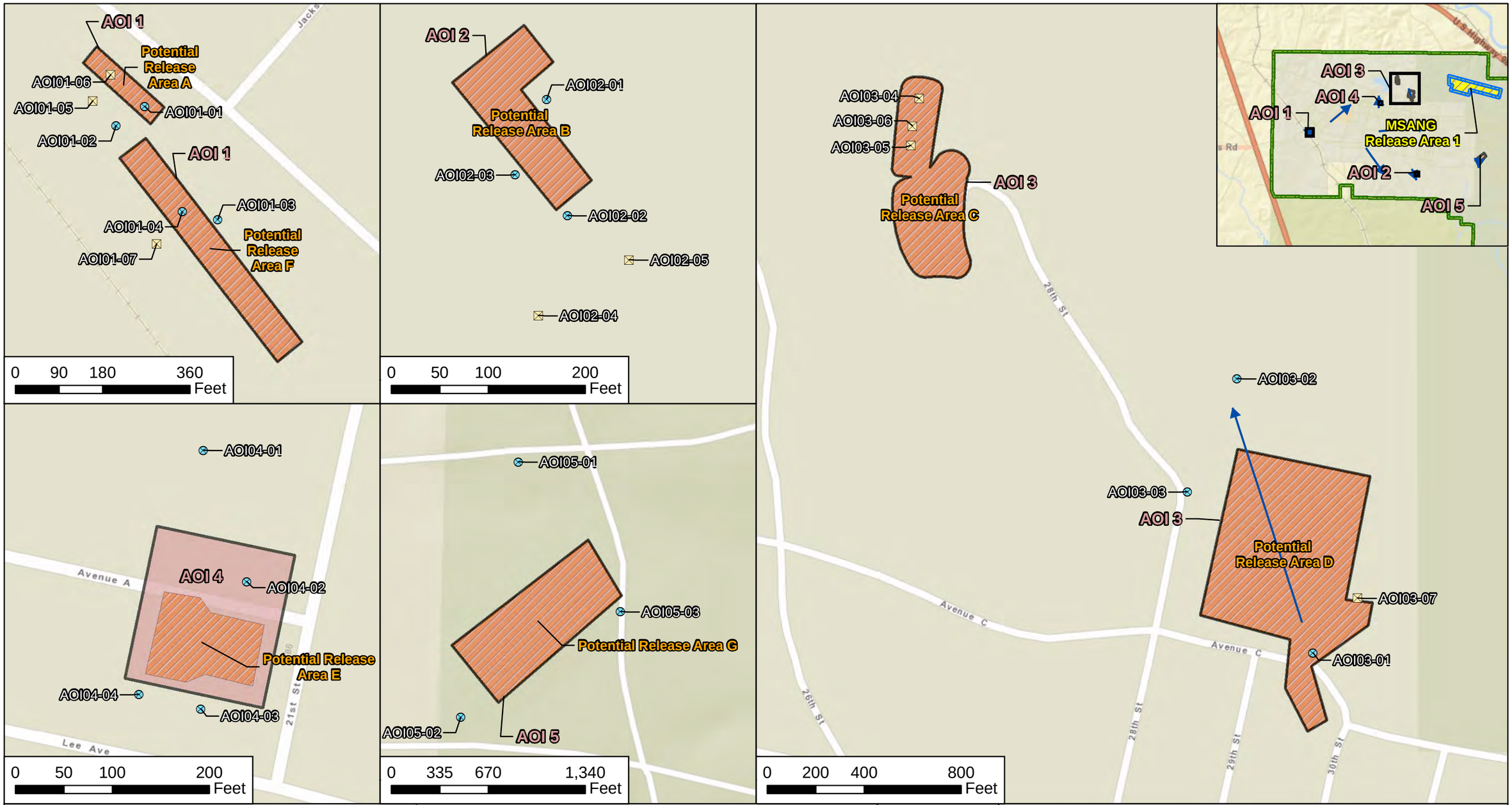

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	11/2/2022	GIS BY	MS	11/2/2022
SCALE	1:4,800	CHK BY	JH	11/2/2022
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)		PM	CM	11/2/2022

- Soil Boring
- Surface Soil
- Area of Interest
- Potential Release Area
- Known Release Area from ANG SI
- Facility Boundary
- Approximate MSANG Boundary
- Groundwater Flow Direction

N

Site Inspection Sample Locations

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 5-1

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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 each AOI is provided in **Section 6.3** through **Section 6.7**. **Table 6-2** through **Table 6-5** 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 site concentration for sampled media exceed the SLs established in the OSD memorandum, the AOI will proceed to the next phase under CERCLA. The SLs established in the OSD memorandum apply to the five compounds presented on **Table 6-1** below.

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

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

Notes:
bgs = below ground surface; µg/kg = micrograms per kilogram; ng/L = nanograms per liter

a.) Assistant Secretary of Defense, 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. 6 July 2022.

b.) 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.

The data in the subsequent sections are compared to 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 and pH, which are important for evaluating transport through the soil medium. **Appendix F** contains the results of the TOC and pH 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 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: Release Areas A & F. The soil and groundwater results are summarized on **Table 6-2** through **Table 6-5**. Soil and groundwater results for AOI 1 are presented on **Figure 6-1**, **Figure 6-4**, **Figure 6-7**, **Figure 6-10**, **Figure 6-13**, **Figure 6-16**, and **Figure 6-19**.

6.3.1 AOI 1 Soil Analytical Results

Figure 6-1, **Figure 6-4**, **Figure 6-7**, **Figure 6-10**, and **Figure 6-13** present the ranges of detections in soil. **Table 6-2** through **Table 6-4** summarize the soil results.

Soil was sampled from surface soil (0 to 2 feet bgs) from boring locations AOI01-01 through AOI01-07. Soil was also sampled from shallow subsurface soil (between 5 and 16 feet bgs) from locations AOI01-01 through AOI01-04. Samples were also collected from deep subsurface soil intervals (between 18 and 21 feet bgs) from boring locations AOI01-01 and AOI01-04. Results for surface soil samples are as follows:

- PFOS was detected above of the SL of 13 micrograms per kilogram (µg/kg) at location AOI01-01, with a concentration of 49.4 µg/kg. PFOS was also detected below the SL at four other borings.
- PFOA was detected below the SL in three borings, with a maximum concentration of 0.885 J µg/kg at AOI01-01.
- PFHxS was detected below the SL in five borings, with a maximum concentration of 2.24 µg/kg at AOI01-05.
- PFNA was detected below the SL in two borings, with a maximum concentration of 0.048 J µg/kg at AOI01-05.
- PFBS was detected below the SL in three borings, with a maximum concentration observed of 0.068 J µg/kg at AOI01-04.
- The relevant compounds were all non-detect in surface soil collected from borings AOI01-03 and AOI01-07.

There were no exceedances of SLs in shallow subsurface soil collected from AOI 1. Results for shallow subsurface soil are as follows:

- PFOA, PFBS, and PFNA were detected at one location, AOI01-01. PFOA was detected below the shallow subsurface soil SL of 250 µg/kg, with a concentration of 40.0 µg/kg. PFBS and PFNA were also detected but at concentrations several orders of magnitude below their SLs.
- PFOS was detected at all locations sampled for subsurface soil (AOI01-01 through AOI01-04), with a maximum concentration of 36.5 µg/kg at AOI01-01.
- PFHxS was detected in all locations, except AOI01-03, with a maximum concentration of 79.2 µg/kg at AOI01-01.

In deep subsurface soil samples collected at AOI01-01 and AOI01-04, PFOS and PFHxS were detected in both samples, with a maximum concentration of 1.19 µg/kg. PFOA and PFBS were detected at AOI01-01, with a maximum concentration of 0.097 J µg/kg. PFNA was not detected in samples collected from either location.

6.3.2 AOI 1 Groundwater Analytical Results

Figure 6-16 and **Figure 6-19** present the ranges of detections in groundwater. **Table 6-5** summarizes the groundwater results. Groundwater was sampled from temporary monitoring wells AOI01-01 through AOI01-04. The following exceedances of the SLs were measured:

- PFOA was detected above the SL of 6 nanograms per liter (ng/L) in all four wells, with concentrations ranging from 6.08 ng/L at AOI01-03 to 84.3 ng/L at AOI01-04.
- PFOS was detected above the SL of 4 ng/L in all four wells, with concentrations ranging from of 1,470 ng/L at AOI01-02 to 4,970 ng/L at AOI01-03.
- PFHxS was detected above the SL of 39 ng/L at AOI01-01, AOI01-02, and AOI01-04, with exceedances ranging from 295 ng/L at AOI01-04 to 616 ng/L at AOI01-01.
- PFNA was detected above the SL of 6 ng/L at AOI01-03 and AOI01-04, with concentrations of 12.6 and 18.4 ng/L, respectively.

PFBS was detected below the SL of 601 ng/L at all four wells, with concentrations ranging from 2.69 J at AOI01-03 to 22.5 ng/L at AOI01-04.

6.3.3 AOI 1 Conclusions

Based on the results of the SI, PFOA, PFHxS, PFNA, and PFBS were detected in soil, below their SLs. PFOS was detected in surface soil above the SL at one location, AOI01-01. PFOA, PFOS, PFHxS, and PFNA were detected in groundwater, above their respective SLs. PFBS was detected below the SL in groundwater at all locations. Based on the exceedances of the SLs in soil and groundwater, further evaluation at AOI 1 is warranted.

6.4 AOI 2

This section presents the analytical results for soil and groundwater in comparison to SLs for AOI 2: Release Area B. The results in soil and groundwater are summarized on **Table 6-2** through **Table 6-5**. Soil and groundwater results for AOI 2 are presented on **Figure 6-2**, **Figure 6-5**, **Figure 6-8**, **Figure 6-11**, **Figure 6-14**, **Figure 6-17**, and **Figure 6-20**.

6.4.1 AOI 2 Soil Analytical Results

Figure 6-2, **Figure 6-5**, **Figure 6-8**, **Figure 6-11**, and **Figure 6-14** present the ranges of detections in soil. **Table 6-2** through **Table 6-4** summarize the soil results.

Soil was sampled from surface soil (0 to 2 feet bgs) at locations AOI02-01 through AOI02-05, while shallow subsurface soil (13 to 15 feet bgs) and deep subsurface soil (22 to 24 feet bgs) were sampled from boring locations AOI02-01, AOI02-02, and AOI02-03. Results for surface soil are as follows:

- PFOS exceeded the SL of 13 µg/kg at AOI02-02 and AOI02-04, with concentrations of 93.6 µg/kg and 93.9 µg/kg, respectively. PFOS was detected below the SL at all other locations.
- PFOA was detected below the SL of 19 µg/kg at four locations. The maximum concentration was 0.736 J µg/kg at AOI02-05.
- PFHxS was detected at all five locations below the SL of 130 µg/kg, with a maximum concentration of 1.37 µg/kg at AOI02-04.
- PFNA was detected at all four locations below the SL of 19 µg/kg, with the maximum concentration of 1.31 µg/kg at AOI02-05.
- PFBS was detected at AOI02-04 and AOI02-05 at several orders of magnitude below the SL of 1,900 µg/kg.

All shallow subsurface soil detections were below their SLs. Results are as follows:

- PFOS was detected at location AOI02-02, with a concentration of 0.153 J µg/kg.
- PFHxS was detected at two locations, with a maximum concentration of 9.16 µg/kg at AOI02-02.
- PFBS was detected at two locations, with a maximum concentration of 4.40 µg/kg at AOI02-02.
- PFOA and PFNA were not detected at any of the three locations.
- All relevant compounds were non-detect at AOI02-01.

In deep subsurface soil, PFOS was detected in two borings, with a maximum concentration of 0.262 J µg/kg. PFHxS was detected in all three locations, with a maximum concentration of 0.423 J µg/kg. PFBS was detected in two borings, with a maximum concentration of 0.076 J. PFOA and PFNA were not detected in any of the three boring locations.

6.4.2 AOI 2 Groundwater Analytical Results

Figure 6-17 and **Figure 6-20** present the ranges of detections in groundwater. **Table 6-5** summarizes the groundwater results. Groundwater was sampled from temporary monitoring wells AOI2-01, AOI2-02, and AOI02-03. The following exceedances were measured:

- PFOA was detected above the SL of 6 ng/L at AOI02-01 and AOI02-02, with concentrations of 40.6 ng/L and 103 ng/L, respectively.
- PFOS was detected above the SL of 4 ng/L at all three locations, with concentrations ranging from 17.2 ng/L at AOI02-03 to 2,960 ng/L at AOI02-02.
- PFHxS was detected above the SL of 39 ng/L at all three locations, with concentrations ranging from 174 ng/L at AOI02-03 to 1,720 ng/L at AOI02-02.

PFNA was detected below the SL of 6 ng/L at AOI02-01 and AOI02-02, with concentrations of 1.25 J and 2.21 J ng/L, respectively. PFBS was detected below the SL of 601 ng/L at all three locations, with a maximum concentration of 122 ng/L at AOI02-02.

6.4.3 AOI 2 Conclusions

Based on the results of the SI, PFOS was detected above the SL in two surface soil samples. PFOA, PFHxS, PFBS, and PFNA were detected in soil, at concentrations below their SLs. PFOA, PFOS, and PFHxS concentrations detected in groundwater exceeded their SLs. Based on the exceedances of SLs in groundwater, further evaluation at AOI 2 is warranted.

6.5 AOI 3

This section presents the analytical results for soil and groundwater in comparison to SLs for AOI 3: Release Area C & D. The results in soil and groundwater are presented in **Table 6-2** through **Table 6-5**. Soil and groundwater results for AOI 3 are presented on **Figure 6-3**, **Figure 6-6**, **Figure 6-9**, **Figure 6-12**, **Figure 6-15**, **Figure 6-18**, and **Figure 6-21**.

6.5.1 AOI 3 Soil Analytical Results

Figure 6-3, **Figure 6-6**, **Figure 6-9**, **Figure 6-12**, and **Figure 6-15** present the ranges of detections in soil. **Table 6-2** through **Table 6-4** summarize the soil results.

Soil was sampled from surface soil (ranging from 0 to 2 feet bgs) from locations AOI03-01 through AOI03-07. Soil was also sampled from shallow subsurface soil (between 14 and 16 feet bgs) from AOI03-01 and AOI03-02. Deep subsurface soil (between 16 and 35 feet bgs) was sampled from boring locations AOI3-01, AOI3-02, and AOI03-03. All detections in surface soil at AOI 3 were below the SLs. The surface soil results are as follows:

- PFOA, PFHxS, and PFBS were detected at two of the seven locations, with a maximum concentration of 0.248 J µg/kg.
- PFOS was detected at five of the seven locations, with a maximum concentration of 0.528 J µg/kg.
- PFNA was detected at four of the seven locations, with a maximum concentration of 0.062 J µg/kg.
- Relevant compounds were non-detect in surface soil collected from AOI03-01 and AOI03-02.

PFHxS was detected below the SL of 1,600 µg/kg in shallow subsurface soil at AOI03-01, with a concentration of 0.039 J µg/kg. PFOA, PFOS, PFNA, and PFBS were not detected in the shallow subsurface soil. The relevant compounds were not detected in the deep subsurface soil.

6.5.2 AOI 3 Groundwater Analytical Results

Figure 6-18 and **Figure 6-21** present the ranges of detections in groundwater. **Table 6-5** summarizes the groundwater results. Groundwater was sampled from temporary monitoring wells AOI03-01, AOI03-02, and AOI03-03. The following exceedances were measured:

- PFOA was detected above the SL of 6 ng/L in AOI03-02, with a concentration of 9.45 ng/L.
- PFOS was detected above the SL of 4 ng/L at AOI03-02, with a concentration of 7.48 ng/L.

PFHxS and PFBS were detected below their SLs in AOI03-02 and AOI03-03, with concentrations ranging from 1.73 J ng/L to 3.13 J ng/L. PFNA was non-detect in all groundwater samples.

6.5.3 AOI 3 Conclusions

Based on the results of the SI, the relevant compounds were detected in soil below their respective SLs. PFOA and PFOS were detected in groundwater at concentrations above their respective SLs. Based on the exceedances of the SLs in groundwater, further evaluation at AOI 3 is warranted.

6.6 AOI 4

This section presents the analytical results for soil and groundwater in comparison to SLs for AOI 4: Release Area E. The results in soil and groundwater are presented in **Table 6-2** through **Table 6-5**. Soil and groundwater results for AOI 4 are presented on **Figure 6-3**, **Figure 6-6**, **Figure 6-9**, **Figure 6-12**, **Figure 6-15**, **Figure 6-18**, and **Figure 6-21**.

6.6.1 AOI 4 Soil Analytical Results

Figure 6-3, **Figure 6-6**, **Figure 6-9**, **Figure 6-12**, and **Figure 6-15** present the ranges of detections in soil. **Table 6-2** through **Table 6-4** summarize the soil results.

Soil was sampled from surface soil (0 to 2 feet bgs), shallow subsurface soil (13 to 15 feet bgs), and deep subsurface soil (between 28 and 32 feet bgs) from boring locations AOI04-01 through AOI04-04. Relevant compounds were not detected in any of the surface, shallow subsurface, or deep subsurface soil samples collected from AOI 4.

6.6.2 AOI 4 Groundwater Analytical Results

Figure 6-18 and **Figure 6-21** present the ranges of detections in groundwater. **Table 6-5** summarizes the groundwater results. Groundwater was sampled from temporary monitoring wells AOI04-01 through AOI04-04. All detections in groundwater were below their SLs. The groundwater results are as follows:

- PFOS was detected below the SL of 4 ng/L at AOI04-01 and AOI04-04, with concentrations of 1.12 J and 1.05 J ng/L, respectively.
- PFBS was detected below the SL of 601 ng/L in AOI04-03, with a concentration of 1.44 J ng/L.
- PFOA, PFHxS, and PFNA were non-detect for all four wells.
- The relevant compounds were not detected in AOI04-02.

6.6.3 AOI 4 Conclusions

Based on the results of the SI, the relevant compounds were not detected in soil at AOI 4. PFOS and PFBS were detected in groundwater below their respective SLs. Based on these results, no further evaluation of AOI 4 is warranted.

6.7 AOI 5

This section presents the analytical results for soil and groundwater in comparison to SLs for AOI 5: Release Area G. The results in soil and groundwater are summarized on **Table 6-2** through **Table 6-5**. Soil and groundwater results for AOI 5 are presented on **Figure 6-2**, **Figure 6-5**, **Figure 6-8**, **Figure 6-11**, **Figure 6-14**, **Figure 6-17**, and **Figure 6-20**.

6.7.1 AOI 5 Soil Analytical Results

Figure 6-2, **Figure 6-5**, **Figure 6-8**, **Figure 6-11**, and **Figure 6-14** present the ranges of detections in soil. **Table 6-2** through **Table 6-4** summarize the soil results.

Soil was sampled from surface soil (0 to 2 feet bgs) and subsurface soil (between 5 and 16 feet bgs) from boring locations AOI05-01 through AOI05-03. Deep subsurface soil (28 to 30 feet bgs) was collected from boring location AOI05-03. Surface soil results are as follows:

- PFOS was detected in two borings, with concentrations of 0.065 J and 0.066 J µg/kg.
- PFHxS and PFNA were detected in one sample, with a maximum concentration of 0.056 J µg/kg.
- PFOA and PFBS were not detected at any surface soil samples.
- The relevant compounds were not detected in surface soil at boring AOI05-02.

All relevant compounds were below their SLs in shallow subsurface soil. The shallow subsurface soil results are as follows:

- PFOS and PFHxS were detected in the sample collected from 5 to 7 feet bgs at AOI05-02, at concentrations of 0.067 J µg/kg and 0.038 J µg/kg, respectively.
- PFOA, PFNA, and PFBS were not detected in any shallow subsurface soil samples..

The relevant compounds were not detected in deep subsurface soil collected at AOI05-03.

6.7.2 AOI 5 Groundwater Analytical Results

Figure 6-17 and **Figure 6-20** present the ranges of detections in groundwater. **Table 6-5** summarizes the groundwater results. Groundwater was sampled from temporary monitoring wells AOI05-01, AOI05-02, and AOI05-03. There were no exceedances of SLs in groundwater samples at AOI 5. The groundwater results are as follows:

- PFOA was detected at AOI05-02 and AOI05-03, with concentrations of 4.78 and 1.66 J ng/L, respectively.
- PFOS was detected at AOI05-02 and AOI05-03, with concentrations of 1.19 J and 1.31 J ng/L, respectively.
- PFNA was detected at AOI05-02, with a concentration of 1.44 J ng/L.
- PFHxS and PFBS were not detected in any of the three groundwater samples.
- The relevant compounds were not detected in AOI05-01.

6.7.3 AOI 5 Conclusions

Based on the results of the SI, PFOS, PFHxS, and PFNA were detected below their respective SLs in soil at AOI 5. PFOA, PFOS, and PFNA were detected below their SLs in groundwater. Based on these results, further evaluation of AOI 5 is not warranted.

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Table 6-2
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Surface Soil
Site Inspection Report, Camp Shelby Joint Forces Training Center

Area of Interest		AOI01																AOI02			
Sample ID		AOI01-01-SB-00-02		AOI01-02-SB-00-02		AOI01-03-SB-00-02		AOI01-04-SB-00-02		AOI01-04-SB-00-02-D		AOI01-05-SB-00-02		AOI01-06-SB-00-02		AOI01-07-SB-00-02		AOI02-01-SB-00-02		AOI02-02-SB-00-02	
Sample Date		05/26/2022		05/26/2022		05/26/2022		05/26/2022		05/26/2022		05/26/2022		05/26/2022		05/26/2022		05/25/2022		05/25/2022	
Depth		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft	
Analyte	OSD Screening Level [a]	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Soil, LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)																					
PFBS	1900	0.026	J	ND	U	ND	U	0.061	J	0.054	J	0.068	J	ND	U	ND	U	ND	U	ND	U
PFHxS	130	0.968	J	0.049	J	ND	U	0.889	J	1.23		2.24		0.448	J	ND	U	0.936	J	0.422	J
PFNA	19	0.024	J	ND	U	ND	U	ND	U	ND	U	0.048	J	ND	U	ND	U	0.093	J	0.047	J
PFOA	19	0.885	J	ND	U	ND	U	0.146	J	0.139	J	0.808	J	0.253	J	ND	U	0.178	J	ND	U
PFOS	13	49.4		4.76		ND	U	0.916	J	1.22		0.546	J	0.718	J	ND	U	7.64		72.7	

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

a. 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 direct ingestion of contaminated soil.

Interpreted Qualifiers

J = Estimated concentration

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

UJ = The analyte was not detected at a level greater than or equal to the adjusted DL. However, the reported adjusted DL is approximate and may be inaccurate or imprecise.

Notes

ND = Analyte not detected above the LOD. LOD values are presented in Appendix F.

Limit of Detection (LOD) ranges for relevant compounds:

PFBS: 0.049-0.059 µg/kg
PFHxS: 0.097-0.118 µg/kg
PFNA: 0.049-0.059 µg/kg
PFOA: 0.194-0.236 µg/kg
PFOS: 0.194-1.12 µg/kg

Chemical Abbreviations

PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AOI	Area of Interest
D	duplicate
DL	detection limit
ft	feet
HQ	hazard quotient
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
ND	analyte not detected above the LOD
OSD	Office of the Secretary of Defense
QSM	Quality Systems Manual
Qual	interpreted qualifier
SB	soil boring
USEPA	United States Environmental Protection Agency
µg/kg	micrograms per kilogram

Table 6-2
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Surface Soil
Site Inspection Report, Camp Shelby Joint Forces Training Center

Area of Interest		AOI02								AOI03											
Sample ID		AOI02-02-SB-00-02-D		AOI02-03-SB-00-02		AOI02-04-SB-00-02		AOI02-05-SB-00-02		AOI03-01-SB-00-02		AOI03-02-SB-00-02		AOI03-03-SB-00-02		AOI03-04-SB-00-02		AOI03-05-SB-00-02		AOI03-06-SB-00-1.2	
Sample Date		05/25/2022		05/25/2022		05/25/2022		05/25/2022		05/26/2022		05/26/2022		05/25/2022		05/26/2022		05/26/2022		05/27/2022	
Depth		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-1.2 ft	
Analyte	OSD Screening Level [a]	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Soil, LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)																					
PFBS	1900	ND	U	ND	U	0.049	J	0.031	J	ND	U	ND	U	ND	U	ND	U	ND	U	0.024	J
PFHxS	130	0.460	J	0.061	J	1.37		0.419	J	ND	U	ND	U	ND	U	ND	U	ND	U	0.057	J
PFNA	19	0.031	J	ND	U	0.370	J	1.31		ND	U	ND	U	0.025	J	0.043	J	0.062	J	0.025	J
PFOA	19	ND	U	0.117	J	0.234	J	0.736	J	ND	U	ND	U	ND	U	0.121	J	0.248	J	ND	U
PFOS	13	93.6		1.09		93.9		2.61		ND	U	ND	U	0.448	J	0.511	J	0.277	J	0.528	J

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

a. 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 direct ingestion of contaminated soil.

Interpreted Qualifiers

J = Estimated concentration

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

UJ = The analyte was not detected at a level greater than or equal to the adjusted DL. However, the reported adjusted DL is approximate and may be inaccurate or imprecise.

Notes

ND = Analyte not detected above the LOD. LOD values are presented in Appendix F.

Limit of Detection (LOD) ranges for relevant compounds:

PFBS: 0.049-0.059 µg/kg
PFHxS: 0.097-0.118 µg/kg
PFNA: 0.049-0.059 µg/kg
PFOA: 0.194-0.236 µg/kg
PFOS: 0.194-1.12 µg/kg

Chemical Abbreviations

PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AOI	Area of Interest
D	duplicate
DL	detection limit
ft	feet
HQ	hazard quotient
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
ND	analyte not detected above the LOD
OSD	Office of the Secretary of Defense
QSM	Quality Systems Manual
Qual	interpreted qualifier
SB	soil boring
USEPA	United States Environmental Protection Agency
µg/kg	micrograms per kilogram

Table 6-2
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Surface Soil
Site Inspection Report, Camp Shelby Joint Forces Training Center

Area of Interest		AOI03				AOI04										AOI05					
Sample ID		AOI03-07-SB-00-02		AOI03-07-SB-00-02-D		AOI04-01-SB-00-02		AOI04-02-SB-00-02		AOI04-03-SB-00-02		AOI04-03-SB-00-02-D		AOI04-04-SB-00-02		AOI05-01-SB-00-02		AOI05-02-SB-00-02		AOI05-03-SB-00-02	
Sample Date		05/27/2022		05/27/2022		05/24/2022		05/24/2022		05/24/2022		05/24/2022		05/24/2022		05/24/2022		05/23/2022		05/23/2022	
Depth		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft		0-2 ft	
Analyte	OSD Screening Level [a]	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Soil, LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)																					
PFBS	1900	0.025	J	ND	UJ	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFHxS	130	0.046	J	0.036	J	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	0.056	J
PFNA	19	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	0.024	J	ND	U	ND	U
PFOA	19	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFOS	13	0.065	J	0.067	J	ND	U	ND	U	ND	U	ND	U	ND	U	0.065	J	ND	U	0.066	J

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

a. 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 direct ingestion of contaminated soil.

Interpreted Qualifiers

J = Estimated concentration

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

UJ = The analyte was not detected at a level greater than or equal to the adjusted DL. However, the reported adjusted DL is approximate and may be inaccurate or imprecise.

Notes

ND = Analyte not detected above the LOD. LOD values are presented in Appendix F.

Limit of Detection (LOD) ranges for relevant compounds:

PFBS: 0.049-0.059 µg/kg
PFHxS: 0.097-0.118 µg/kg
PFNA: 0.049-0.059 µg/kg
PFOA: 0.194-0.236 µg/kg
PFOS: 0.194-1.12 µg/kg

Chemical Abbreviations

PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AOI	Area of Interest
D	duplicate
DL	detection limit
ft	feet
HQ	hazard quotient
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
ND	analyte not detected above the LOD
OSD	Office of the Secretary of Defense
QSM	Quality Systems Manual
Qual	interpreted qualifier
SB	soil boring
USEPA	United States Environmental Protection Agency
µg/kg	micrograms per kilogram

Table 6-2
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Surface Soil
Site Inspection Report, Camp Shelby Joint Forces Training Center

Area of Interest	AOI05		
Sample ID	AOI05-03-SB-00-02-D		
Sample Date	05/23/2022		
Depth	0-2 ft		
Analyte	**OSD Screening Level [a]**	**Result**	**Qual**
Soil, LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)			
PFBS	1900	ND	U
PFHxS	130	ND	UJ
PFNA	19	ND	U
PFOA	19	ND	U
PFOS	13	ND	UJ

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

a. 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

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

UJ = The analyte was not detected at a level greater than or equal to the adjusted DL. However, the reported adjusted DL is approximate and may be inaccurate or imprecise.

Notes

ND = Analyte not detected above the LOD. LOD values are presented in Appendix F.

Limit of Detection (LOD) ranges for relevant compounds:

PFBS: 0.049-0.059 µg/kg

PFHxS: 0.097-0.118 µg/kg

PFNA: 0.049-0.059 µg/kg

PFOA: 0.194-0.236 µg/kg

PFOS: 0.194-1.12 µg/kg

Chemical Abbreviations

PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AOI	Area of Interest
D	duplicate
DL	detection limit
ft	feet
HQ	hazard quotient
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
ND	analyte not detected above the LOD
OSD	Office of the Secretary of Defense
QSM	Quality Systems Manual
Qual	interpreted qualifier
SB	soil boring
USEPA	United States Environmental Protection Agency
µg/kg	micrograms per kilogram

Table 6-3
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Shallow Subsurface Soil
Site Inspection Report, Camp Shelby

Area of Interest		AOI01														AOI02					
Sample ID		AOI01-01-SB-09-11		AOI01-02-SB-05-07		AOI01-02-SB-10-12		AOI01-03-SB-06-08		AOI01-03-SB-14-16		AOI01-03-SB-14-16-D		AOI01-04-SB-8.5-10.5		AOI02-01-SB-13-15		AOI02-02-SB-13-15		AOI02-03-SB-13-15	
Sample Date		05/26/2022		05/26/2022		05/26/2022		05/26/2022		05/26/2022		05/26/2022		05/26/2022		05/25/2022		05/25/2022		05/25/2022	
Depth		9-11 ft		5-7 ft		10-12 ft		6-8 ft		14-16 ft		14-16 ft		8.5-10.5 ft		13-15 ft		13-15 ft		13-15 ft	
Analyte	OSD Screening Level [a]	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Soil, LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)																					
PFBS	25000	2.35		ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	4.40		0.067	J
PFHxS	1600	79.2		0.096	J	ND	U	ND	U	ND	U	ND	U	0.059	J	ND	U	9.16		0.213	J
PFNA	250	0.054	J	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFOA	250	40.0		ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFOS	160	36.5		0.451	J	0.109	J	0.216	J	5.16		3.10		0.694	J	ND	U	0.153	J	ND	U

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

a. 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

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

Limit of Detection (LOD) ranges for relevant compounds:

PFBS: 0.049-0.059 µg/kg

PFHxS: 0.097-0.532 µg/kg

PFNA: 0.049-0.059 µg/kg

PFOA: 0.194-0.238 µg/kg

PFOS: 0.194-0.238 µg/kg

Chemical Abbreviations

PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AOI	Area of Interest
D	duplicate
DL	detection limit
ft	feet
HQ	hazard quotient
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
ND	analyte not detected above the LOD
OSD	Office of the Secretary of Defense
QSM	Quality Systems Manual
Qual	interpreted qualifier
SB	soil boring
USEPA	United States Environmental Protection Agency
µg/kg	micrograms per kilogram

Table 6-3
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Shallow Subsurface Soil
Site Inspection Report, Camp Shelby

Area of Interest		AOI03						AOI04								AOI05					
Sample ID		AOI03-01-SB-14-16		AOI03-01-SB-14-16-D		AOI03-02-SB-14-16		AOI04-01-SB-13-15		AOI04-02-SB-13-15		AOI04-03-SB-13-15		AOI04-04-SB-13-15		AOI05-01-SB-06-08		AOI05-01-SB-14-16		AOI05-02-SB-05-07	
Sample Date		05/26/2022		05/26/2022		05/26/2022		05/24/2022		05/24/2022		05/24/2022		05/24/2022		05/24/2022		05/24/2022		05/23/2022	
Depth		14-16 ft		14-16 ft		14-16 ft		13-15 ft		13-15 ft		13-15 ft		13-15 ft		6-8 ft		14-16 ft		5-7 ft	
Analyte	OSD Screening Level [a]	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Soil, LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)																					
PFBS	25000	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFHxS	1600	0.039	J	0.035	J	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	0.038	J
PFNA	250	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFOA	250	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFOS	160	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	0.067	J

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

a. 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

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

Limit of Detection (LOD) ranges for relevant compounds:

PFBS: 0.049-0.059 µg/kg

PFHxS: 0.097-0.532 µg/kg

PFNA: 0.049-0.059 µg/kg

PFOA: 0.194-0.238 µg/kg

PFOS: 0.194-0.238 µg/kg

Chemical Abbreviations

PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AOI	Area of Interest
D	duplicate
DL	detection limit
ft	feet
HQ	hazard quotient
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
ND	analyte not detected above the LOD
OSD	Office of the Secretary of Defense
QSM	Quality Systems Manual
Qual	interpreted qualifier
SB	soil boring
USEPA	United States Environmental Protection Agency
µg/kg	micrograms per kilogram

Table 6-3
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Shallow Subsurface Soil
Site Inspection Report, Camp Shelby

	Area of Interest	AOI05			
	Sample ID	AOI05-02-SB-07-09		AOI05-03-SB-13-15	
	Sample Date	05/23/2022		05/23/2022	
	Depth	7-9 ft		13-15 ft	
Analyte	OSD Screening Level [a]	Result	Qual	Result	Qual
Soil, LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)					
PFBS	25000	ND	U	ND	U
PFHxS	1600	ND	U	ND	U
PFNA	250	ND	U	ND	U
PFOA	250	ND	U	ND	U
PFOS	160	ND	U	ND	U

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

a. 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

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

Limit of Detection (LOD) ranges for relevant compounds:

PFBS: 0.049-0.059 µg/kg

PFHxS: 0.097-0.532 µg/kg

PFNA: 0.049-0.059 µg/kg

PFOA: 0.194-0.238 µg/kg

PFOS: 0.194-0.238 µg/kg

Chemical Abbreviations

PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AOI	Area of Interest
D	duplicate
DL	detection limit
ft	feet
HQ	hazard quotient
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
ND	analyte not detected above the LOD
OSD	Office of the Secretary of Defense
QSM	Quality Systems Manual
Qual	interpreted qualifier
SB	soil boring
USEPA	United States Environmental Protection Agency
µg/kg	micrograms per kilogram

Table 6-4
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Deep Subsurface Soil
Site Inspection Report, Camp Shelby Joint Forces Training Center

Area of Interest	AOI01				AOI02						AOI03			
Sample ID	AOI01-01-SB-18-20		AOI01-04-SB-19-21		AOI02-01-SB-22-24		AOI02-02-SB-22-24		AOI02-03-SB-22-24		AOI03-01-SB-28-30		AOI03-02-SB-32-34	
Sample Date	05/26/2022		05/26/2022		05/25/2022		05/25/2022		05/25/2022		05/26/2022		05/26/2022	
Depth	18-20 ft		19-21 ft		22-24 ft		22-24 ft		22-24 ft		28-30 ft		32-34 ft	
Analyte	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Soil, LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)														
PFBS	0.024	J	ND	U	ND	U	0.076	J	0.034	J	ND	U	ND	U
PFHxS	0.441	J	0.067	J	0.042	J	0.038	J	0.423	J	ND	U	ND	U
PFNA	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFOA	0.097	J	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFOS	1.19		0.953	J	0.095	J	ND	U	0.262	J	ND	U	ND	U

Interpreted Qualifiers
J = Estimated concentration
U = The analyte was not detected at a level greater than or equal to the adjusted DL

Notes
ND = Analyte not detected above the LOD. LOD values are presented in Appendix F.

Limit of Detection (LOD) ranges for relevant compounds:
PFBS: 0.049-0.056 µg/kg
PFHxS: 0.099-0.112 µg/kg
PFNA: 0.049-0.056 µg/kg
PFOA: 0.198-0.224 µg/kg
PFOS: 0.198-0.224 µg/kg

Chemical Abbreviations

PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AOI	Area of Interest
D	duplicate
DL	detection limit
ft	feet
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
ND	analyte not detected above the LOD
QSM	Quality Systems Manual
Qual	interpreted qualifier
SB	soil boring
µg/kg	micrograms per kilogram

Table 6-4
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Deep Subsurface Soil
Site Inspection Report, Camp Shelby Joint Forces Training Center

Area of Interest	AOI03				AOI04								AOI05	
Sample ID	AOI03-03-SB-16-18		AOI03-03-SB-33-35		AOI04-01-SB-28-30		AOI04-02-SB-30-32		AOI04-03-SB-30-32		AOI04-04-SB-28-30		AOI05-03-SB-28-30	
Sample Date	05/26/2022		05/26/2022		05/24/2022		05/24/2022		05/24/2022		05/24/2022		05/23/2022	
Depth	16-18 ft		33-35 ft		28-30 ft		30-32 ft		30-32 ft		28-30 ft		28-30 ft	
Analyte	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Soil, LCMSMS compliant with QSM 5.3 Table B-15 (µg/kg)														
PFBS	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFHxS	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFNA	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFOA	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFOS	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U

Interpreted Qualifiers
J = Estimated concentration
U = The analyte was not detected at a level greater than or equal to the adjusted DL

Notes
ND = Analyte not detected above the LOD. LOD values are presented in Appendix F.

Limit of Detection (LOD) ranges for relevant compounds:
PFBS: 0.049-0.056 µg/kg
PFHxS: 0.099-0.112 µg/kg
PFNA: 0.049-0.056 µg/kg
PFOA: 0.198-0.224 µg/kg
PFOS: 0.198-0.224 µg/kg

Chemical Abbreviations

PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AOI	Area of Interest
D	duplicate
DL	detection limit
ft	feet
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
ND	analyte not detected above the LOD
QSM	Quality Systems Manual
Qual	interpreted qualifier
SB	soil boring
µg/kg	micrograms per kilogram

Table 6-5
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Groundwater
Site Inspection Report, Camp Shelby Joint Forces Training Center

Area of Interest		AOI01										AOI02						AOI03	
Sample ID		AOI01-01-GW		AOI01-01-GW-D		AOI01-02-GW		AOI01-03-GW		AOI01-04-GW		AOI02-01-GW		AOI02-02-GW		AOI02-03-GW		AOI03-01-GW	
Sample Date		05/26/2022		05/26/2022		05/26/2022		05/27/2022		05/26/2022		05/26/2022		05/26/2022		05/26/2022		05/27/2022	
Analyte	OSD Screening Level [a]	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Water, LCMSMS compliant with QSM 5.3 Table B-15 (ng/l)																			
PFBS	601	11.8		9.63		16.2		2.69	J	22.5		19.7		122		21.9		ND	U
PFHxS	39	616		503		316		11.0		295		713		1720		174		ND	U
PFNA	6	4.27		3.92		0.998	J	12.6		18.4		1.25	J	2.21	J	ND	U	ND	U
PFOA	6	72.5		63.3		26.3		6.08		84.3		40.6		103		2.73	J	ND	U
PFOS	4	2710	J	2090		1470		4970		2120		292		2960		17.2		2.16	J

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

a. 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 groundwater.

Interpreted Qualifiers

J = Estimated concentration

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

Notes

ND = Analyte not detected above the LOD. LOD values are presented in Appendix F.

Limit of Detection (LOD) ranges for relevant compounds:

PFBS: 1.87-2.00 ng/L

PFHxS: 2.80-14.5 ng/L

PFNA: 1.87-2.00 ng/L

PFOA: 1.87-2.00 ng/L

PFOS: 1.87-9.84 ng/L

Chemical Abbreviations

PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AOI	Area of Interest
D	duplicate
DL	detection limit
GW	groundwater
HQ	hazard quotient
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
ND	analyte not detected above the LOD
OSD	Office of the Secretary of Defense
QSM	Quality Systems Manual
Qual	interpreted qualifier
USEPA	United States Environmental Protection Agency
ng/l	nanogram per liter

Table 6-5
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Groundwater
Site Inspection Report, Camp Shelby Joint Forces Training Center

Area of Interest		AOI03				AOI04								AOI05					
Sample ID		AOI03-02-GW		AOI03-03-GW		AOI04-01-GW		AOI04-02-GW		AOI04-03-GW		AOI04-04-GW		AOI05-01-GW		AOI05-01-GW-D		AOI05-02-GW	
Sample Date		05/27/2022		05/27/2022		05/27/2022		05/27/2022		05/27/2022		05/27/2022		05/26/2022		05/26/2022		05/25/2022	
Analyte	OSD Screening Level [a]	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Water, LCMSMS compliant with QSM 5.3 Table B-15 (ng/l)																			
PFBS	601	1.73	J	2.80	J	ND	U	ND	U	1.44	J	ND	U	ND	U	ND	U	ND	U
PFHxS	39	3.13	J	2.36	J	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
PFNA	6	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	1.44	J
PFOA	6	9.45		1.81	J	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U	4.78	
PFOS	4	7.48		3.24	J	1.12	J	ND	U	ND	U	1.05	J	ND	U	ND	U	1.19	J

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

a. 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 groundwater.

Interpreted Qualifiers

J = Estimated concentration

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

Notes

ND = Analyte not detected above the LOD. LOD values are presented in Appendix F.

Limit of Detection (LOD) ranges for relevant compounds:

PFBS: 1.87-2.00 ng/L

PFHxS: 2.80-14.5 ng/L

PFNA: 1.87-2.00 ng/L

PFOA: 1.87-2.00 ng/L

PFOS: 1.87-9.84 ng/L

Chemical Abbreviations

PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AOI	Area of Interest
D	duplicate
DL	detection limit
GW	groundwater
HQ	hazard quotient
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
ND	analyte not detected above the LOD
OSD	Office of the Secretary of Defense
QSM	Quality Systems Manual
Qual	interpreted qualifier
USEPA	United States Environmental Protection Agency
ng/l	nanogram per liter

Table 6-5
PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Groundwater
Site Inspection Report, Camp Shelby Joint Forces Training Center

	Area of Interest	AOI05	
	Sample ID	AOI05-03-GW	
	Sample Date	05/27/2022	
Analyte	OSD Screening Level [a]	Result	Qual
Water, LCMSMS compliant with QSM 5.3 Table B-15 (ng/l)			
PFBS	601	ND	U
PFHxS	39	ND	U
PFNA	6	ND	U
PFOA	6	1.66	J
PFOS	4	1.31	J

Grey Fill — Detected concentration exceeded OSD Screening Levels

References

a. 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 groundwater.

Interpreted Qualifiers

J = Estimated concentration

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

Notes

ND = Analyte not detected above the LOD. LOD values are presented in Appendix F.

Limit of Detection (LOD) ranges for relevant compounds:

PFBS: 1.87-2.00 ng/L

PFHxS: 2.80-14.5 ng/L

PFNA: 1.87-2.00 ng/L

PFOA: 1.87-2.00 ng/L

PFOS: 1.87-9.84 ng/L

Chemical Abbreviations

PFBS	perfluorobutanesulfonic acid
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

Acronyms and Abbreviations

AASF	Army Aviation Support Facility
AOI	Area of Interest
D	duplicate
DL	detection limit
GW	groundwater
HQ	hazard quotient
ID	identification
LCMSMS	liquid chromatography with tandem mass spectrometry
LOD	limit of detection
ND	analyte not detected above the LOD
OSD	Office of the Secretary of Defense
QSM	Quality Systems Manual
Qual	interpreted qualifier
USEPA	United States Environmental Protection Agency
ng/l	nanogram per liter

Legend

- Facility Boundary
- Approximate MSANG Boundary

PFOA Results (µg/Kg)

- ND
- >ND - 19
- >19 - 250
- >250 - 2,500
- >2,500

N

0 200 400 800 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

PFOA Detections in Soil - AOI 1

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	1/3/2023	GIS BY	MS	1/3/2023
SCALE	1:4,800	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong		PM	CM	1/3/2023

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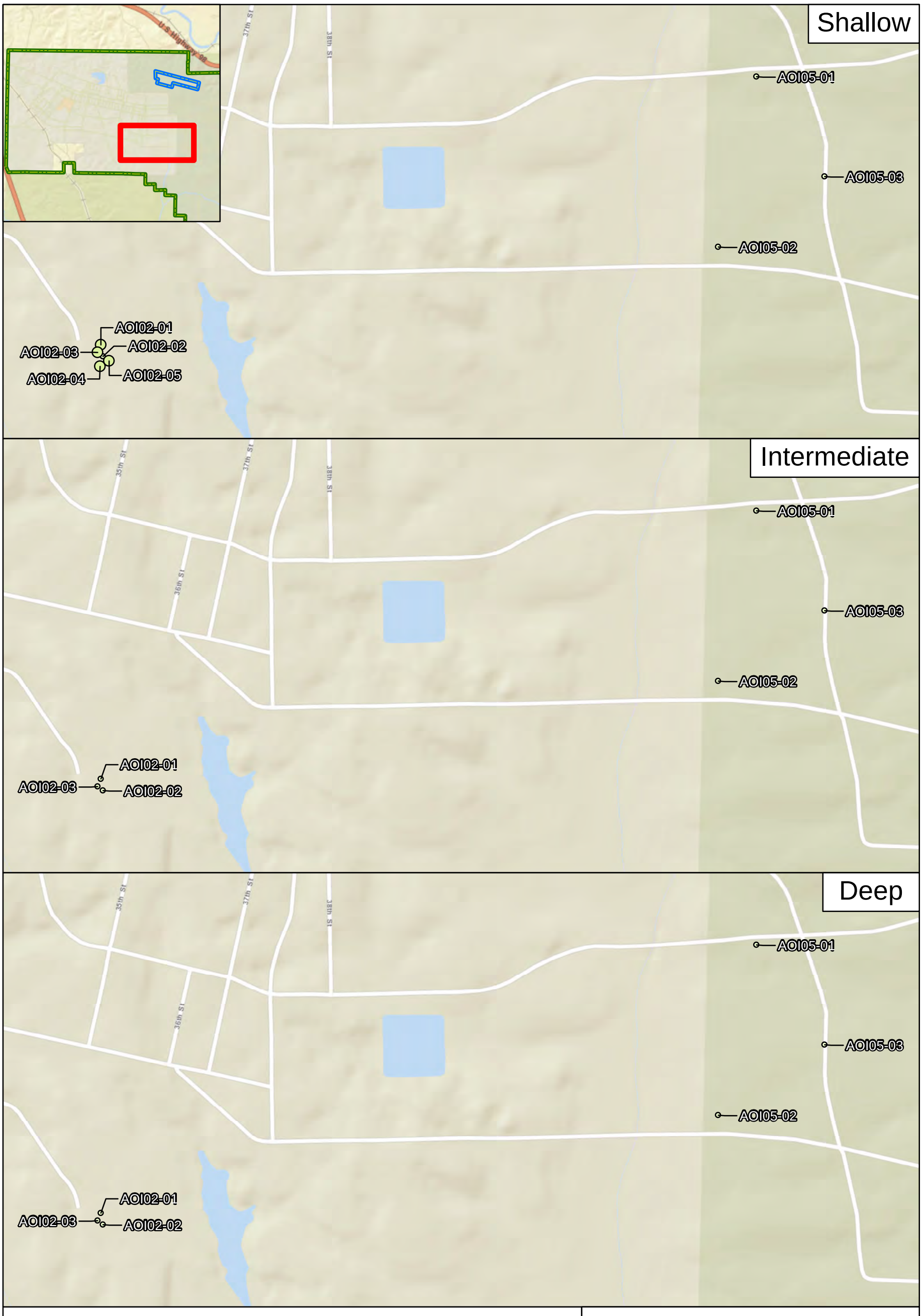
Figure 6-1



PFOA Results (µg/Kg)

- ND
- >ND - 19
- >19 - 250
- >250 - 2,500
- >2,500

Legend

- Facility Boundary
- Approximate MSANG Boundary

N

0 500 1,000 2,000 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

PFOA Detections in Soil - AOI 2 and AOI 5

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	1/3/2023	GIS BY	MS	1/3/2023
SCALE	1:12,000	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong		PM	CM	1/3/2023

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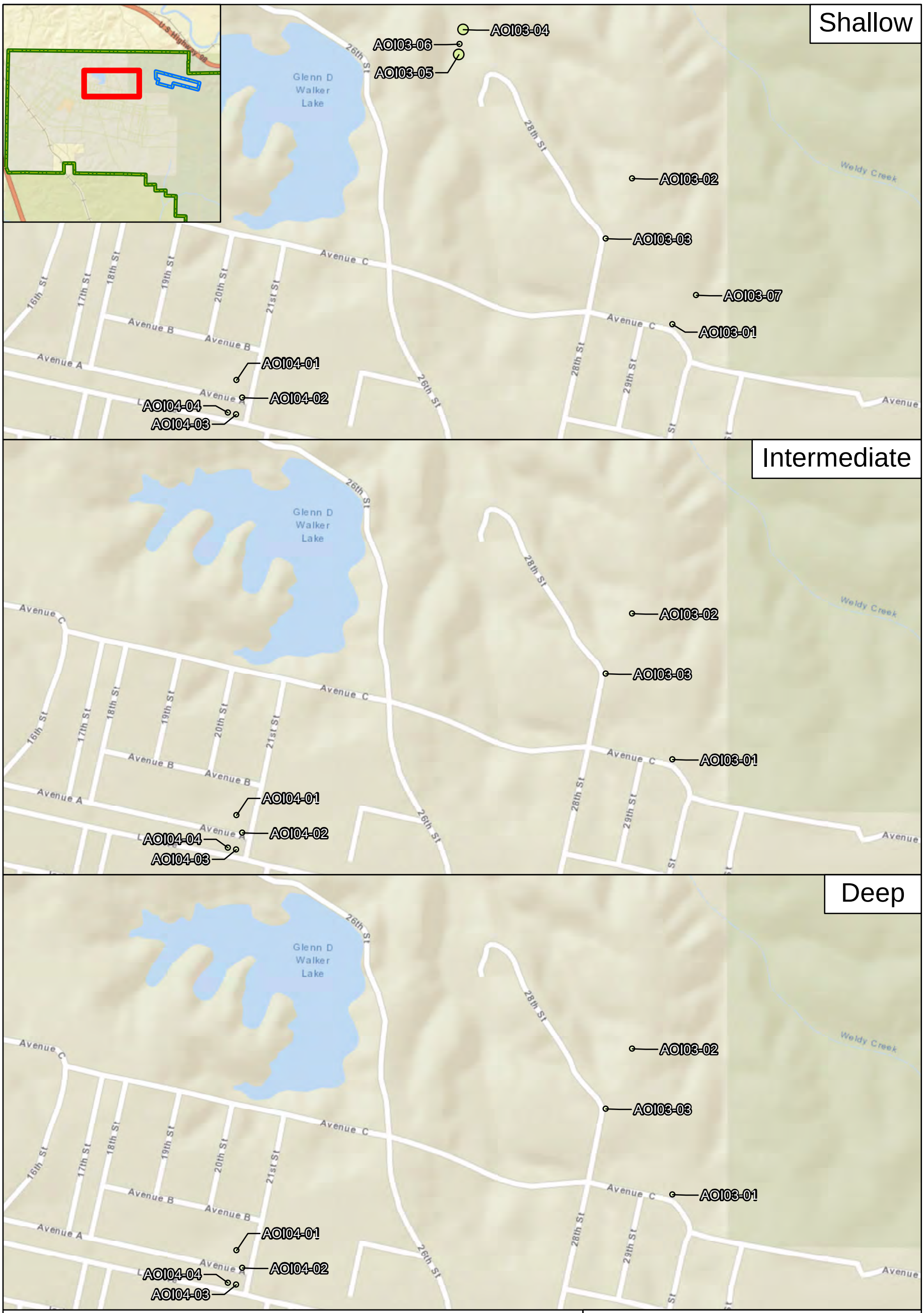
Figure 6-2



PFOA Results (µg/Kg)

- ND
- >ND - 19
- >19 - 250
- >250 - 2,500
- >2,500

Legend

- Facility Boundary
- Approximate MSANG Boundary

N

0 375 750 1,500 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

PFOA Detections in Soil - AOI 3 and AOI 4

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	1/3/2023	GIS BY	MS	1/3/2023
SCALE	1:9,000	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong		PM	CM	1/3/2023

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Figure 6-3

PFOS Results (µg/Kg)

- ND
- >ND - 13
- >13 - 160
- >160 - 1,600
- >1,600

Legend

- Facility Boundary
- Approximate MSANG Boundary

N

0 200 400 800 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

PFOS Detections in Soil - AOI 1

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	1/3/2023	GIS BY	MS	1/3/2023
SCALE	1:4,800	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong		PM	CM	1/3/2023

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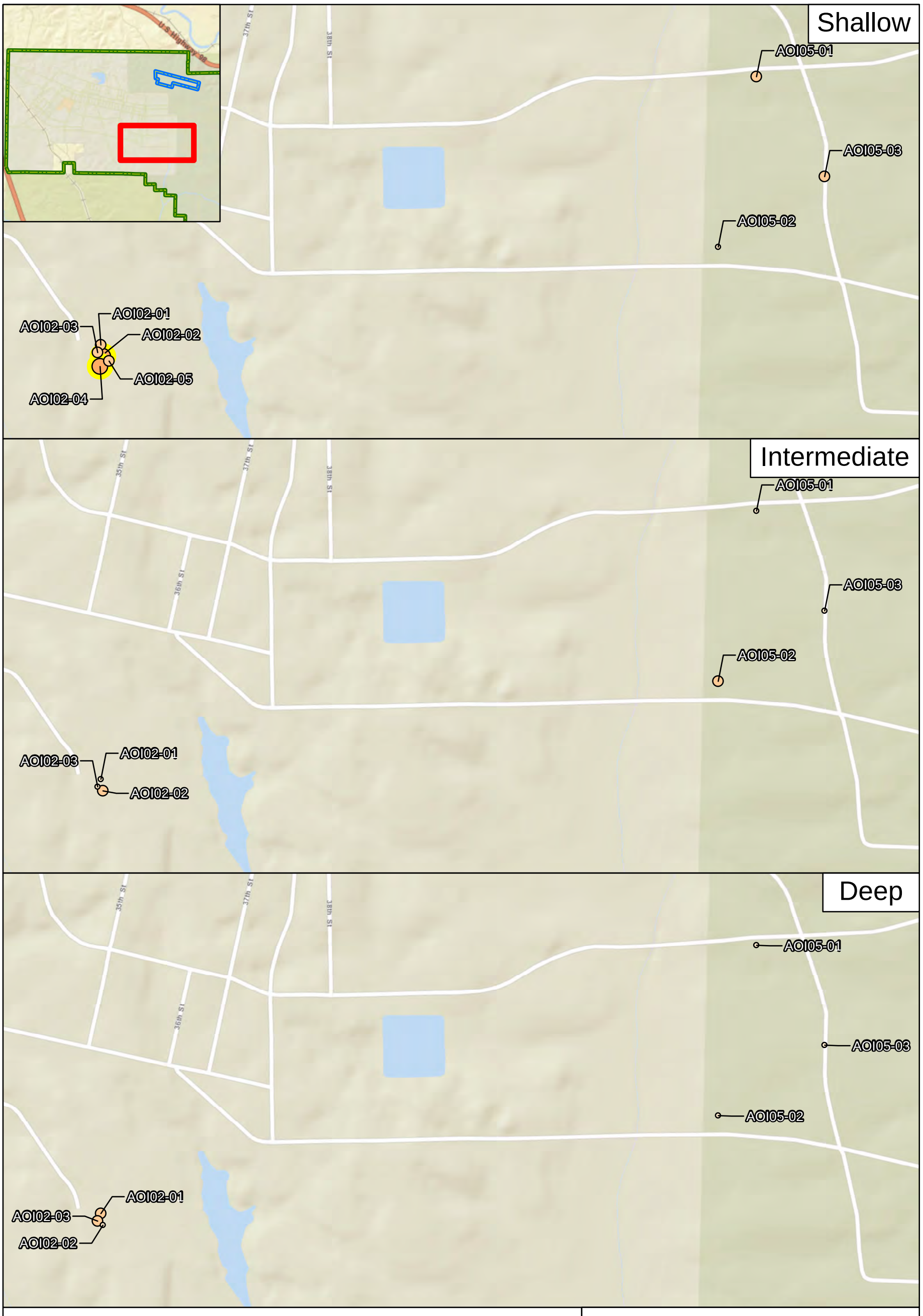
Figure 6-4



Legend

- Facility Boundary
- Approximate MSANG Boundary

PFOS Results (µg/Kg)

- ND
- >ND - 13
- >13 - 160
- >160 - 1,600
- >1,600

N

0 500 1,000 2,000 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

PFOS Detections in Soil - AOI 2 and AOI 5

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	1/3/2023	GIS BY	MS	1/3/2023
SCALE	1:12,000	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong		PM	CM	1/3/2023

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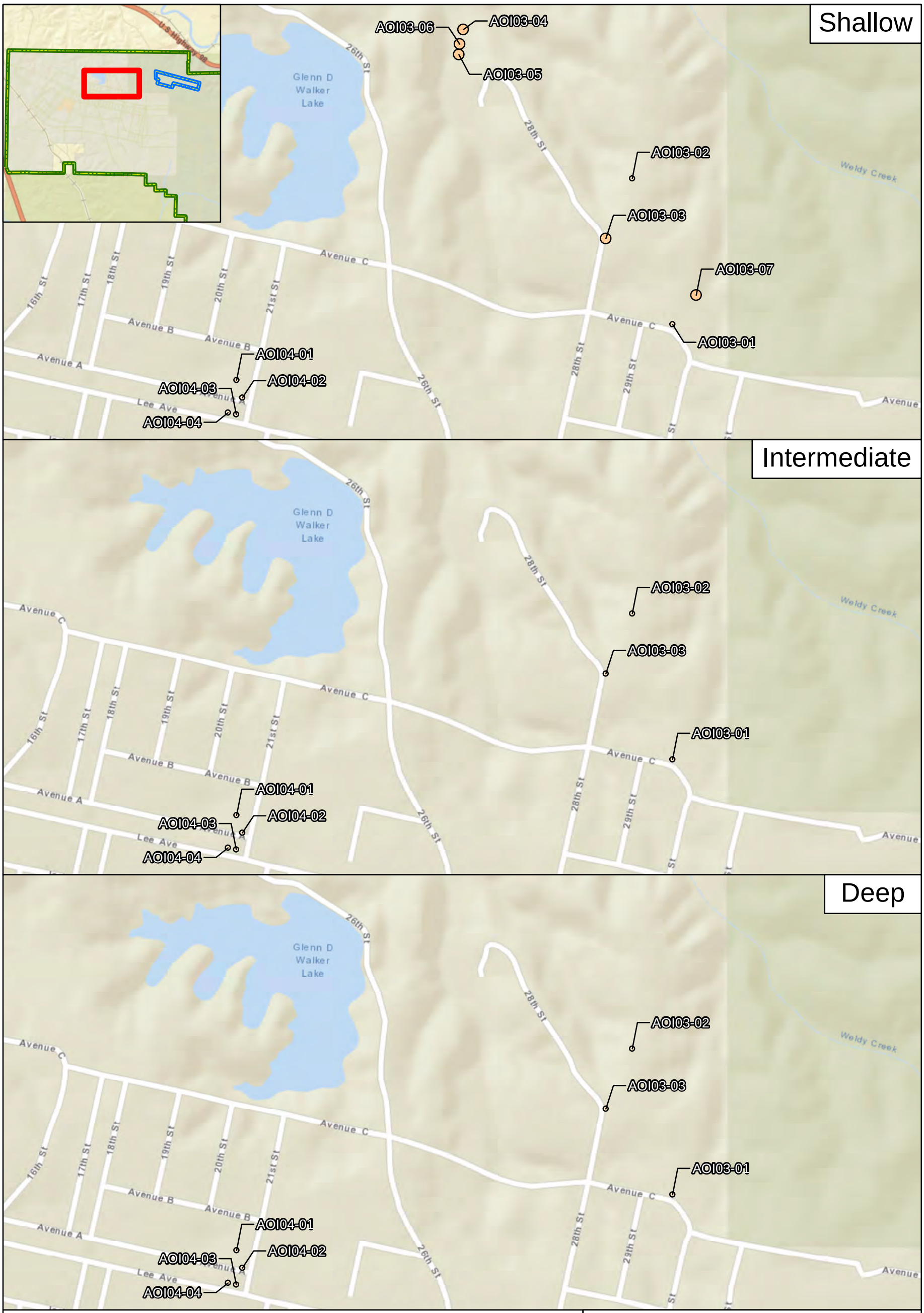
Germantown, MD 20876

Figure 6-5



PFOS Results (µg/Kg)

- ND
- >ND - 13
- >13 - 160
- >160 - 1,600
- >1,600

Legend

- Facility Boundary
- Approximate MSANG Boundary

N

0 375 750 1,500 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

PFOS Detections in Soil - AOI 3 and AOI 4

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	1/3/2023	GIS BY	MS	1/3/2023
SCALE	1:9,000	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong		PM	CM	1/3/2023

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Figure 6-6

PFBS Results (µg/Kg)

- ND
- >ND - 10
- >10 - 1,900
- >1,900 - 25,000
- >25,000

Legend

- Facility Boundary
- Approximate MSANG Boundary

N

0 200 400 800 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

PFBS Detections in Soil - AOI 1

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	1/3/2023	GIS BY	MS	1/3/2023
SCALE	1:4,800	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong		PM	CM	1/3/2023

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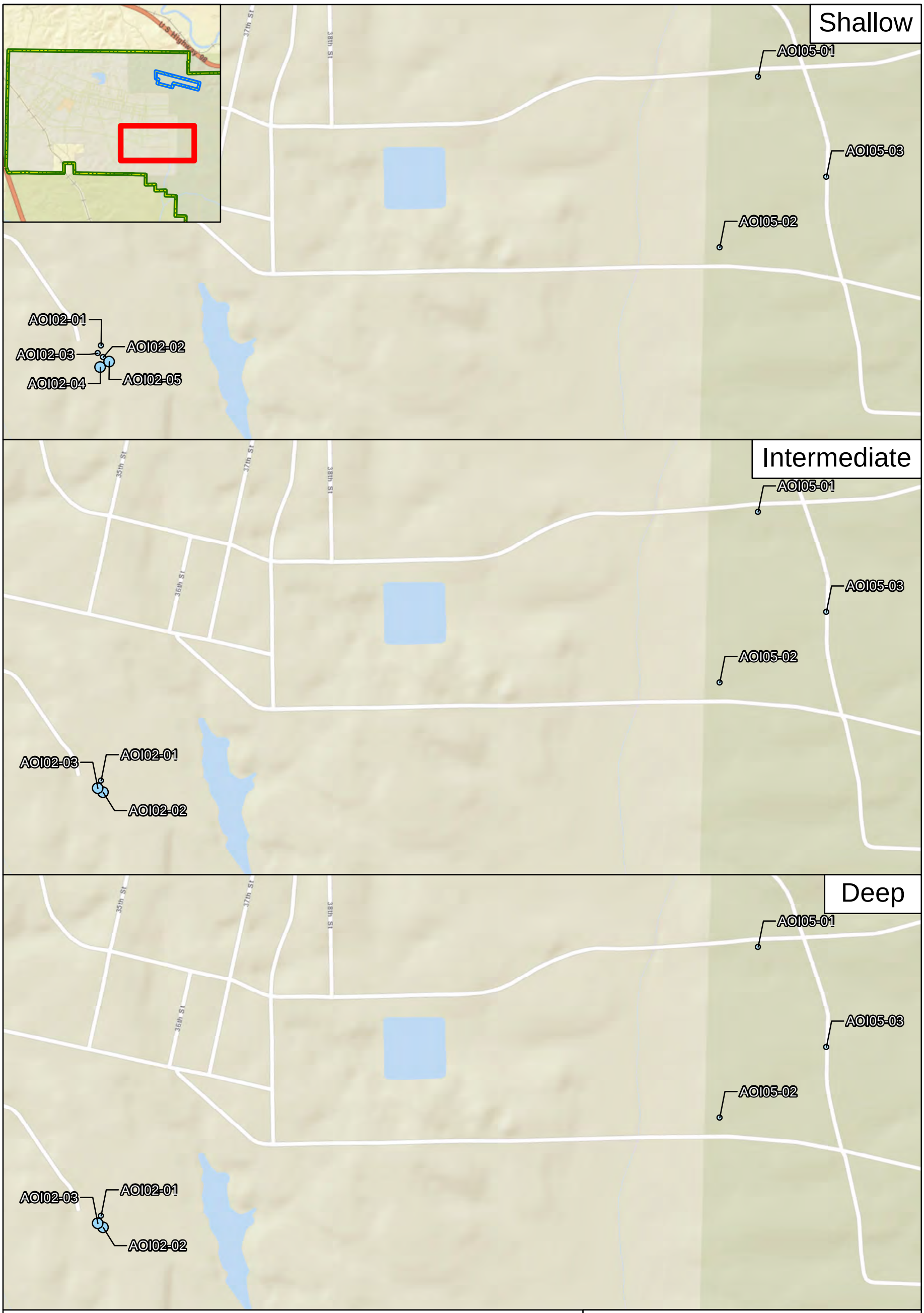
Figure 6-7



PFBS Results (µg/Kg)

- ND
- >ND - 10
- >10 - 1,900
- >1,900 - 25,000
- >25,000

Legend

- Facility Boundary
- Approximate MSANG Boundary

N

0 500 1,000 2,000 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

PFBS Detections in Soil - AOI 2 and AOI 5

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	1/3/2023	GIS BY	MS	1/3/2023
SCALE	1:12,000	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong		PM	CM	1/3/2023

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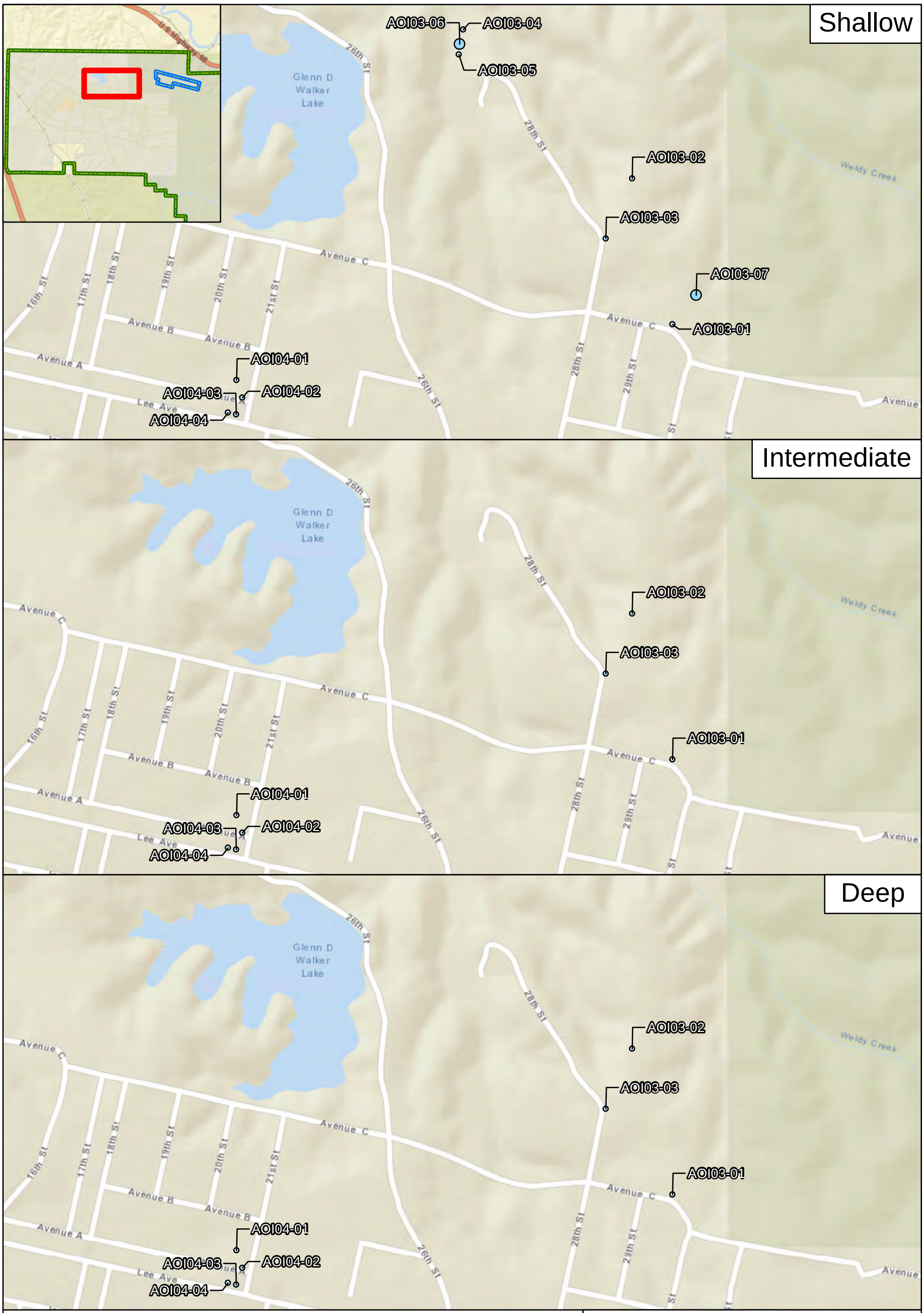
Figure 6-8



PFBS Results (µg/Kg)

- ND
- >ND - 10
- >10 - 1,900
- >1,900 - 25,000
- >25,000

Legend

- Facility Boundary
- Approximate MSANG Boundary

N

0 375 750 1,500 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

PFBS Detections in Soil - AOI 3 and AOI 4

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	1/3/2023	GIS BY	MS	1/3/2023
SCALE	1:9,000	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong		PM	CM	1/3/2023

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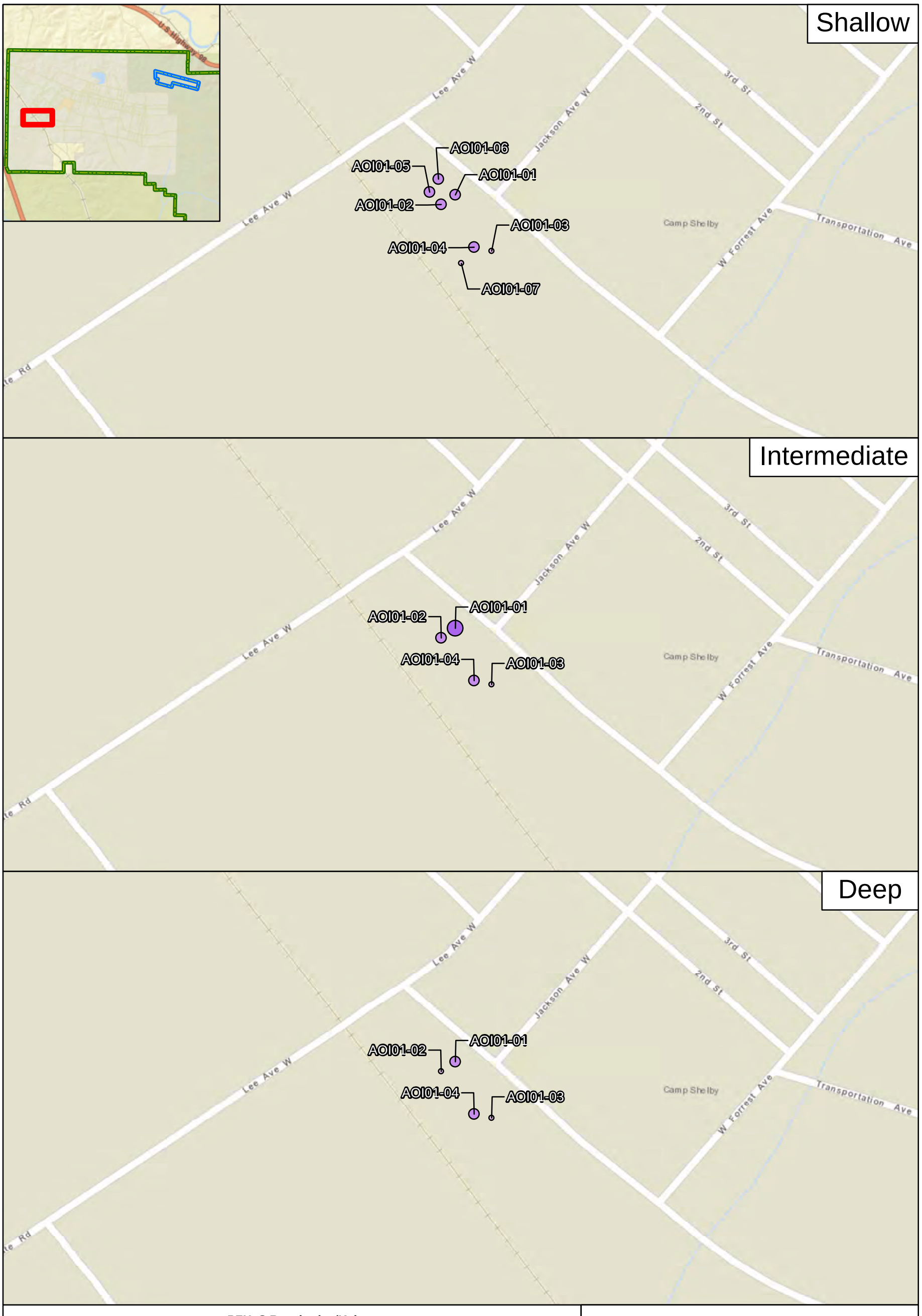
Figure 6-9



PFHxS Results (µg/Kg)

- ND
- >ND - 10
- >10 - 130
- >130 - 1,600
- >1,600

Legend

- Facility Boundary
- Approximate MSANG Boundary

N

0 200 400 800 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

PFHxS Detections in Soil - AOI 1

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	1/3/2023	GIS BY	MS	1/3/2023
SCALE	1:4,800	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong		PM	CM	1/3/2023

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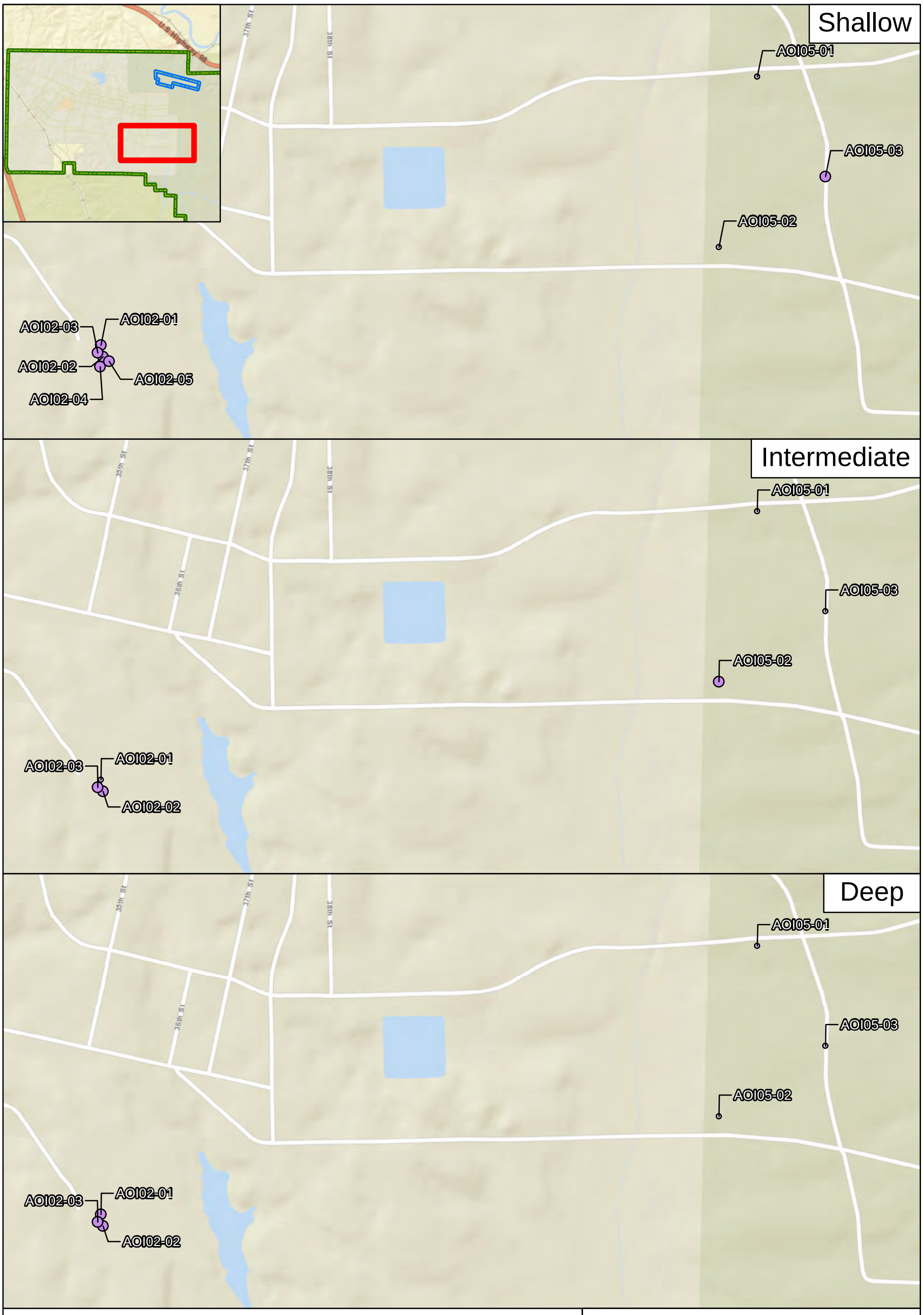
Figure 6-10



PFHxS Results (µg/Kg)

- ND
- >ND - 10
- >10 - 130
- >130 - 1,600
- >1,600

Legend

- Facility Boundary
- Approximate MSANG Boundary

N

0 500 1,000 2,000 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

PFHxS Detections in Soil - AOI 2 and AOI 5

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	1/3/2023	GIS BY	MS	1/3/2023
SCALE	1:12,000	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong		PM	CM	1/3/2023

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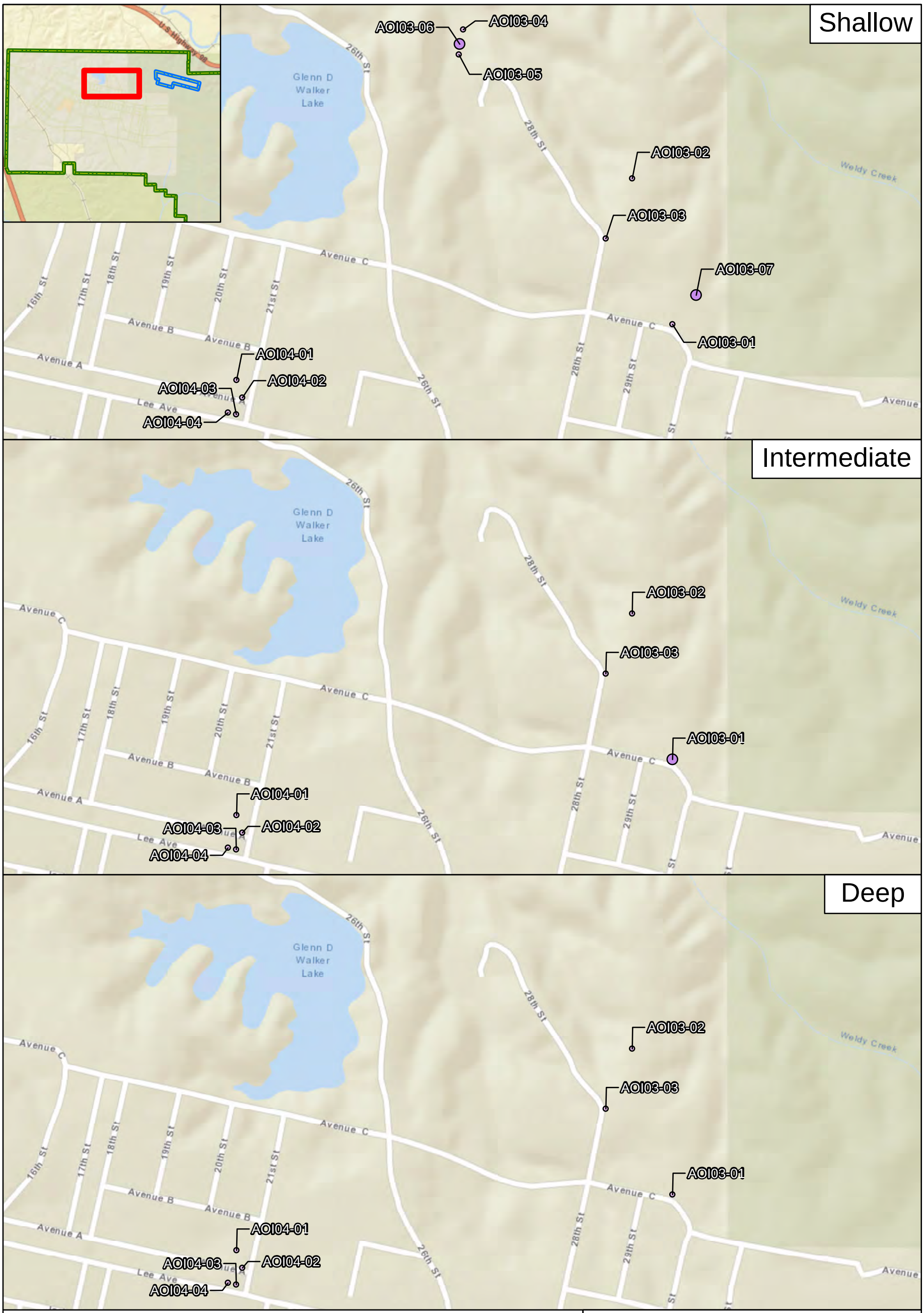
Figure 6-11



Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

PFHxS Detections in Soil - AOI 3 and AOI 4

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	1/3/2023	GIS BY	MS	1/3/2023
SCALE	1:9,000	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong		PM	CM	1/3/2023

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Figure 6-12

Legend

- Facility Boundary
- Approximate MSANG Boundary

PFNA Results (µg/Kg)

- ND
- >ND - 19
- >19 - 250
- >250 - 2,500
- >2,500

N

0 200 400 800 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

PFNA Detections in Soil - AOI 1

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	1/3/2023	GIS BY	MS	1/3/2023
SCALE	1:4,800	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong		PM	CM	1/3/2023

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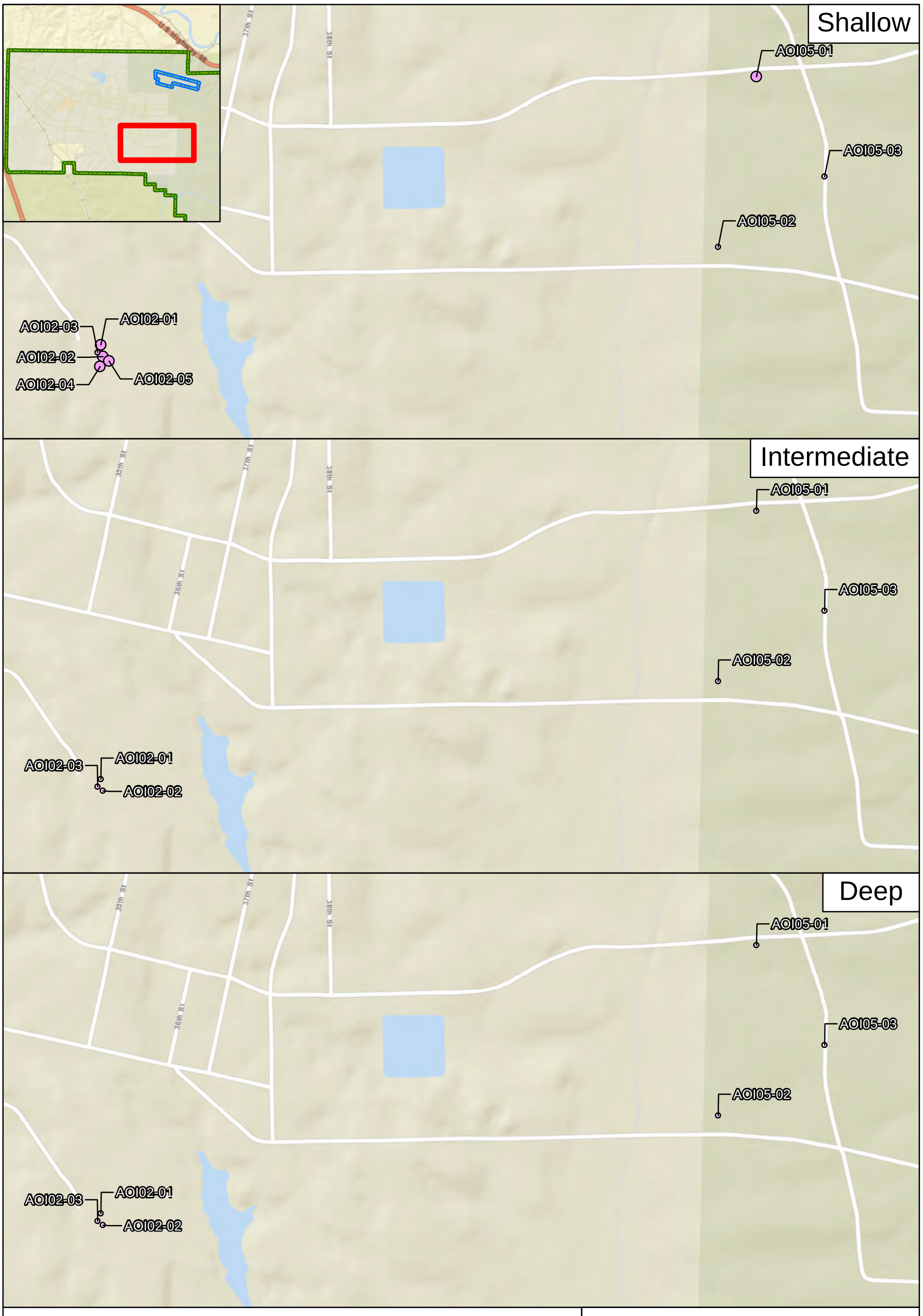
Figure 6-13



PFNA Results (µg/Kg)

- ND
- >ND - 19
- >19 - 250
- >250 - 2,500
- >2,500

Legend

- Facility Boundary
- Approximate MSANG Boundary

N

0 500 1,000 2,000 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

PFNA Detections in Soil - AOI 2 and AOI 5

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	1/3/2023	GIS BY	MS	1/3/2023
SCALE	1:12,000	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong		PM	CM	1/3/2023

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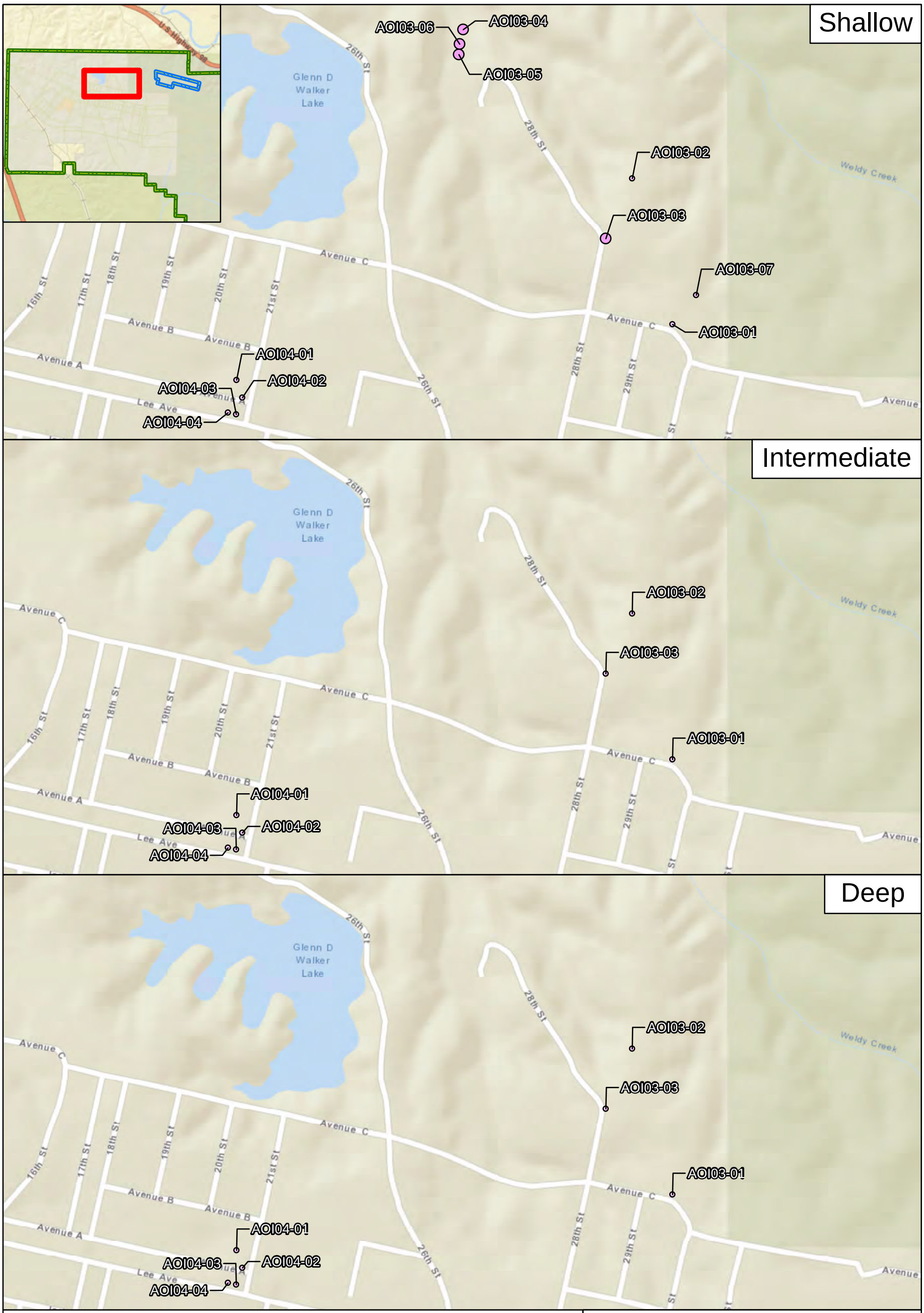
Figure 6-14



PFNA Results (µg/Kg)

- ND
- >ND - 19
- >19 - 250
- >250 - 2,500
- >2,500

Legend

- Facility Boundary
- Approximate MSANG Boundary

N

0 375 750 1,500 Feet

Exceedances of the OSD SL are depicted with a yellow halo.
Depth intervals shown represent respective sampling position within a given soil boring location.

PFNA Detections in Soil - AOI 3 and AOI 4

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	1/3/2023	GIS BY	MS	1/3/2023
SCALE	1:9,000	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong		PM	CM	1/3/2023

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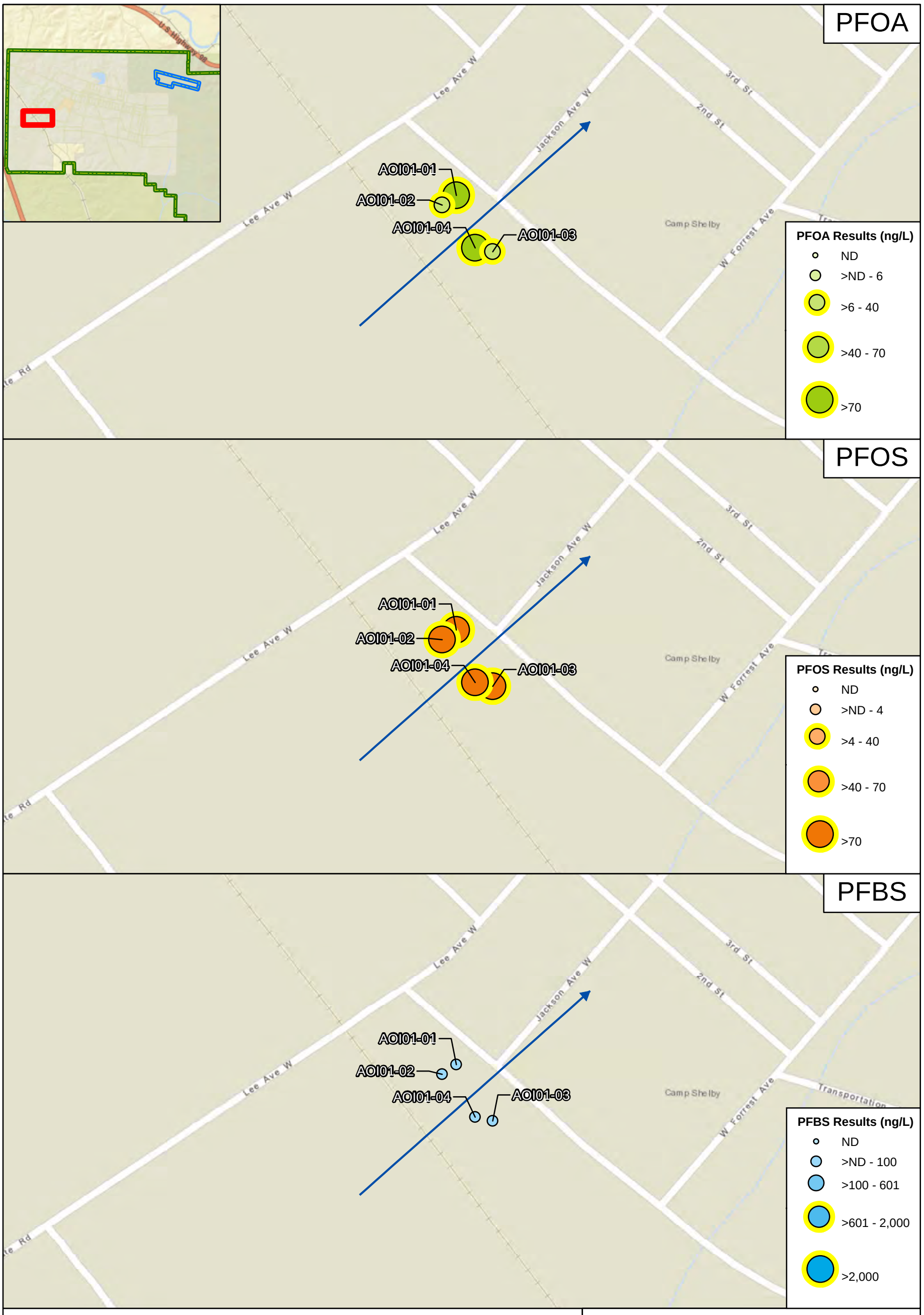
Figure 6-15

PFOA



PFOS

PFBS

Legend

- Facility Boundary
- Approximate MSANG Boundary
- Groundwater Flow Direction

N

0 200 400 800 Feet

Exceedances of the OSD SL are depicted with a yellow halo.

PFOA, PFOS, and PFBS Detections in Groundwater - AOI 1

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	1/3/2023	GIS BY	MS	1/3/2023
SCALE	1:4,800	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong		PM	CM	1/3/2023

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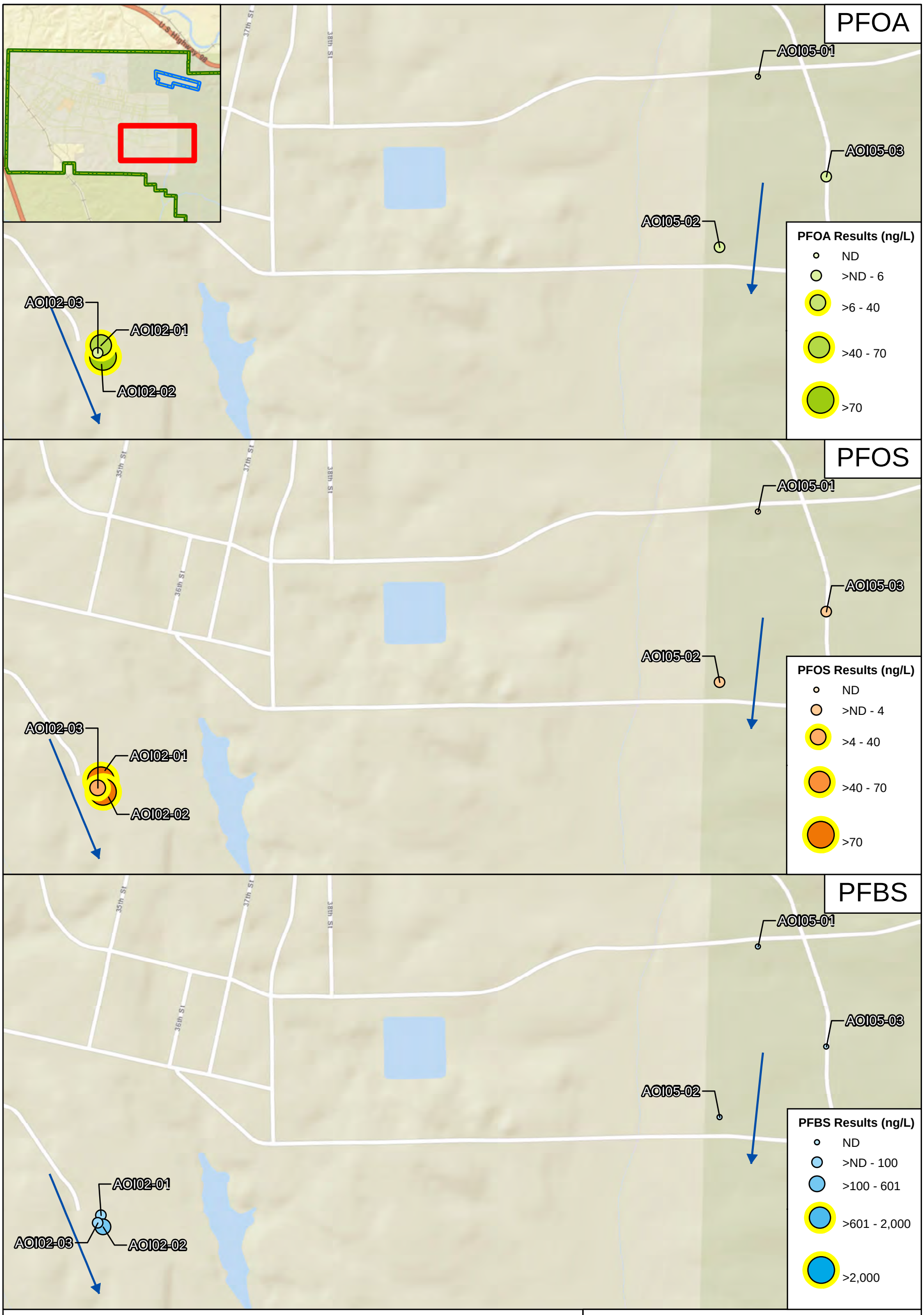
Figure 6-16



Exceedances of the OSD SL are depicted with a yellow halo.

PFOA, PFOS, and PFBS Detections in Groundwater - AOI 2 and AOI 5

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	1/3/2023	GIS BY	MS	1/3/2023
SCALE	1:12,000	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong		PM	CM	1/3/2023

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Figure 6-17

PFOA

PFOS

PFBS

Legend

- Facility Boundary
- Approximate MSANG Boundary
- Groundwater Flow Direction

N

0 375 750 1,500 Feet

Exceedances of the OSD SL are depicted with a yellow halo.

PFOA, PFOS, and PFBS Detections in Groundwater - AOI 3 and AOI 4

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	1/3/2023	GIS BY	MS	1/3/2023
SCALE	1:9,000	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong		PM	CM	1/3/2023

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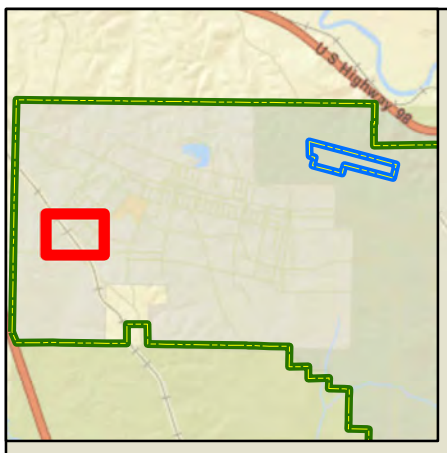
Figure 6-18

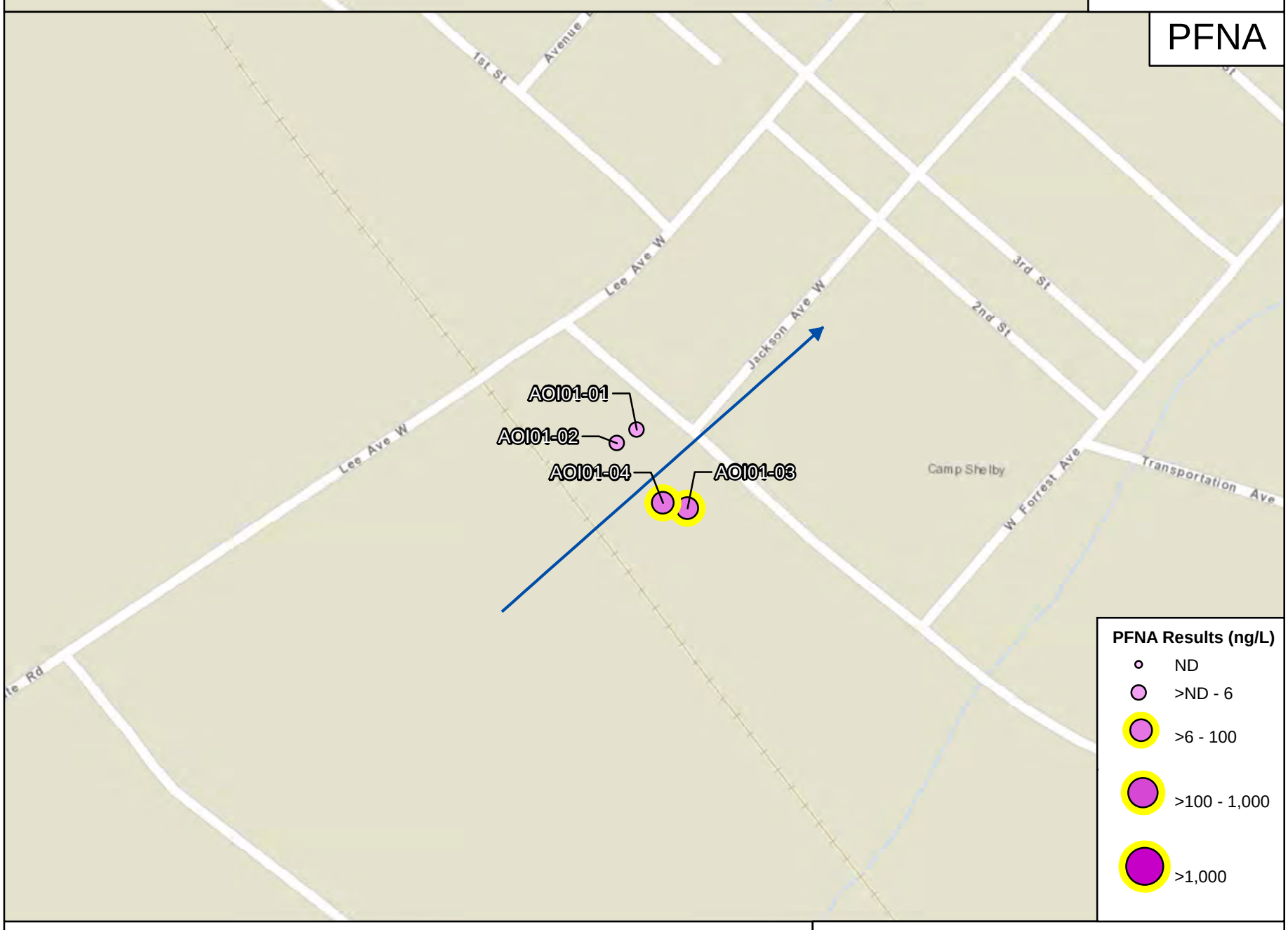
PFHxS



PFHxS Results (ng/L)

- ND
- >ND - 39
- >39 - 100
- >100 - 1,000
- >1,000

PFNA



PFNA Results (ng/L)

- ND
- >ND - 6
- >6 - 100
- >100 - 1,000
- >1,000

Legend

- Facility Boundary
- Approximate MSANG Boundary
- Groundwater Flow Direction

N

0 200 400 800 Feet

Exceedances of the OSD SL are depicted with a yellow halo.

PFHxS and PFNA Detections in Groundwater - AOI 1

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	1/3/2023	GIS BY	MS	1/3/2023
SCALE	1:4,800	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong		PM	CM	1/3/2023

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Figure 6-19

PFHxS

AOI05-01

AOI05-03

AOI05-02

AOI02-01

AOI02-03

AOI02-02

PFHxS Results (ng/L)

- ND
- >ND - 39
- >39 - 100
- >100 - 1,000
- >1,000

PFNA

AOI05-01

AOI05-03

AOI05-02

AOI02-01

AOI02-03

AOI02-02

PFNA Results (ng/L)

- ND
- >ND - 6
- >6 - 100
- >100 - 1,000
- >1,000

Legend

- Facility Boundary
- Approximate MSANG Boundary
- Groundwater Flow Direction

N

0 500 1,000 2,000 Feet

Exceedances of the OSD SL are depicted with a yellow halo.

PFHxS and PFNA Detections in Groundwater - AOI 2 and AOI 5

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	1/3/2023	GIS BY	MS	1/3/2023
SCALE	1:12,000	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong		PM	CM	1/3/2023

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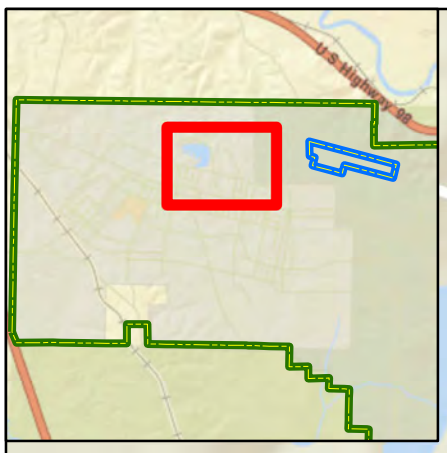
Figure 6-20

PFHxS



Glenn D Walker Lake

26th St

28th St

Weldy Creek

AOI03-02

AOI03-03

AOI03-01

Avenue C

16th St

17th St

18th St

19th St

20th St

21st St

Avenue B

Avenue A

Lee Ave

Jackson Ave

22nd St

23rd St

29th St

30th St

32nd St

AOI04-01

AOI04-02

AOI04-04

AOI04-03

PFHxS Results (ng/L)

- ND
- >ND - 39
- >39 - 100
- >100 - 1,000
- >1,000

PFNA

Legend

- Facility Boundary
- Approximate MSANG Boundary
- Groundwater Flow Direction

N

0 375 750 1,500 Feet

Exceedances of the OSD SL are depicted with a yellow halo.

PFHxS and PFNA Detections in Groundwater - AOI 3 and AOI 4

CLIENT	ARNG			
PROJECT	Site Inspection at Camp Shelby, MS			
REVISED	1/3/2023	GIS BY	MS	1/3/2023
SCALE	1:9,000	CHK BY	JH	1/3/2023
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong		PM	CM	1/3/2023

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Figure 6-21

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7. Exposure Pathways

The CSMs for each AOI, revised based on the SI findings, are presented on **Figure 7-1** through **Figure 7-5**. 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 site 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 figures use an empty circle symbol to represent an incomplete exposure pathway. Areas with an incomplete 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 relevant compounds above the SLs. Areas with an identified potentially complete pathway that have detections of the relevant compounds above the SLs may warrant further investigation. Although the CSMs indicate whether potentially complete exposure pathways may exist, the recommendation for future study in an 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 (although unlikely due to restricted access), on- or off-facility residents, and recreational users outside of 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 AOI 1, AOI 2, AOI 3, AOI 4, and AOI 5 based on the aforementioned criteria.

7.1.1 AOI 1

AOI 1 encompasses Release Area A (the Old Fire Station) and Release Area F (Warehouse – Building 6519), where bulk AFFF was historically stored in 5-gallon buckets. Bulk AFFF would have been stored up until 2004 at the Old Fire Station, while AFFF is still stored at the Warehouse – Building 6519. There are no known historical releases at either location, but it is possible that AFFF was released during regular handling and storage. Potential releases at AOI 1 would have

occurred on both paved areas and grassy surfaces. Some releases may have occurred directly onto surface soil but may also have infiltrated to subsurface soil via cracks in pavement or joints between areas that are paved with different materials. Surface water flows into the stream and creeks downgradient of the AOI.

PFOA, PFOS, PFHxS, PFNA, and PFBS were detected in surface soil at AOI 1, with PFOS detected in exceedance of the SL at one location. Site workers, future construction workers, and trespassers (although unlikely due to restricted access) could contact constituents in surface soil via incidental ingestion and inhalation of dust. Therefore, the surface soil exposure pathways for site workers, future construction workers, and trespassers are considered potentially complete. The five relevant compounds were also detected in subsurface soil at AOI 1. Future construction workers could contact constituents in subsurface soil via incidental ingestion; therefore, the subsurface soil exposure pathway for future construction workers is potentially complete. No active construction was observed to be occurring at or near AOI 1 during the SI. There are no residential buildings adjacent to AOI 1; therefore, the surface and subsurface soil pathways to residents (both on- and off-facility) is considered incomplete. Similarly, there are no recreational activities that occur at AOI 1, and the pathways for recreational users are incomplete. The CSM for AOI 1 is presented on **Figure 7-1**.

7.1.2 AOI 2

AOI 2 is Release Area B, the Old Hagler Airfield Fire Station, which houses two emergency response vehicles that stored AFFF until 2004. There are no known releases at the Old Hagler Airfield Fire Station; however, AFFF was handled regularly at the station, so there is the potential for historical releases of AFFF to have occurred prior 2004. Potential releases at AOI 2 may have occurred on both paved areas and grassy surfaces. Some AFFF releases may have occurred directly onto surface soil but may also have infiltrated to subsurface soil via cracks in pavement or joints between areas that are paved with different materials. Surface water flows into the stream and creeks downgradient of the AOI.

PFOA, PFOS, PFHxS, PFNA, and PFBS were detected in surface soil at AOI 2. Additionally, PFOS exceeded the SL in surface soil exceeded in three of the five sampled locations. Site workers, future construction workers, and trespassers (although unlikely due to restricted access) could contact constituents in surface soil via incidental ingestion and inhalation of dust. Therefore, the surface soil exposure pathways for site workers, future construction workers, and trespassers are considered potentially complete. PFOS, PFNA, and PFBS were detected in subsurface soil at AOI 2; therefore, the subsurface soil incidental ingestion exposure pathway for future construction workers is potentially complete. No active construction was observed to be occurring at or near AOI 2 during the SI. There are no nearby residences or recreational areas; consequently, the surface and subsurface soil exposure pathways for residents (on- and off-facility) and recreational users are incomplete. The CSM for AOI 2 is presented on **Figure 7-2**.

7.1.3 AOI 3

AOI 3 encompasses Release Area C and D, the old and current WWTP systems. Sludge was produced by the old WWTP until 2008 and spread in sludge drying beds (Release Area C). Known AFFF releases occurred at the adjacent MSANG Fire Station during ARFF vehicle washing. Due to uncertainty surrounding AFFF handling at Camp Shelby, there is the potential for AFFF to have entered the original WWTP and associated sludge beds (Release Area C). Since 2011, waste water from the MSANG Fire Station eventually drains to the current WWTP (Release Area D).

PFOA, PFOS, PFHxS, PFNA, and PFBS were detected in surface soil at AOI 3. Site workers, future construction workers, and trespassers (although unlikely due to restricted access) could contact constituents in surface soil via incidental ingestion and inhalation of dust. Therefore, the

surface soil exposure pathways for residents, site workers, future construction workers, and trespassers are potentially complete. Additionally, there is a campground at Glenn D Walker Lake directly west of Release Area C. Recreational users could be exposed to dust generated from construction activities at AOI 3; therefore, the exposure pathway for recreational users via incidental ingestion of dust is potentially complete. PFHxS was detected in subsurface soil at AOI 3. Future construction workers could contact constituents in subsurface soil via incidental ingestion. Therefore, the subsurface soil exposure pathway for future construction workers is potentially complete. No active construction was observed at or near AOI 3 during the SI. There are no nearby residences; therefore, the surface and subsurface soil exposure pathways for residents (on- and off-facility) are incomplete. The CSM for AOI 3 is presented on **Figure 7-3**.

7.1.4 AOI 4

AOI 4 is Release Area E, the Current Fire Station, which was built between 2012 and 2013. No known releases occurred at this location; however, two 5-gallon buckets of AFFF were observed in storage on a firetruck in March 2019 during the VSI.

PFOA, PFOS, PFHxS, PFNA, and PFBS were not detected in surface soil at AOI 4. Therefore, the surface soil exposure pathways for on-site residents living in the barracks across the street, site workers, current and construction workers, and trespassers are incomplete. The relevant compounds were not detected in subsurface soil at AOI 4. Therefore, the exposure pathways to all receptors are considered incomplete. At the time of the SI, construction activities were occurring at AOI 4. The CSM for AOI 4 is presented on **Figure 7-4**.

7.1.5 AOI 5

AOI 5 is Release Area G, the Old Sanitary Landfill, which was constructed prior to the 1980s and received solid waste landfill from the WWTP until 1981. Sludge from the original WWTP was also sent to the Landfill until the early 1990s.

PFOS, PFHxS, and PFNA were detected in surface soil at AOI 5. Site workers, future construction workers, and trespassers (although unlikely due to restricted access) could contact constituents in surface soil via incidental ingestion and inhalation of dust. Therefore, the surface soil exposure pathways for site workers, future construction workers, and trespassers are potentially complete. PFOS and PFHxS were detected in subsurface soil at AOI 5. Future construction workers could contact constituents in subsurface soil via incidental ingestion; therefore, the subsurface soil exposure pathway for construction workers is potentially complete. No construction activities were occurring at or near AOI 5 at the time of the SI. There are no nearby residences or recreational areas; therefore, the surface and subsurface soil exposure pathways for residents (on- and off-facility) and recreational users are incomplete. The CSM for AOI 5 is presented on **Figure 7-5**.

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 based on the aforementioned criteria.

7.2.1 AOI 1

PFOA, PFOS, PFHxS, and PFNA were detected above their SLs in groundwater samples collected at AOI 1. The public water systems within a 4-mile radius of Camp Shelby draw from deep confined aquifers that are not believed to be at risk of contamination from surface water or perched water tables (Slack et al., 2004); however, there are various shallow domestic wells screened as shallow as 30 feet downgradient of Camp Shelby. Therefore, the groundwater exposure pathway for off-facility residents is considered potentially complete. Drinking water to

the facility is supplied from the lower sands of the Hattiesburg Formation. Therefore, the groundwater exposure pathways via ingestion of groundwater for on-facility residents, site workers, and trespassers are considered incomplete. Depths to water measured at AOI 1 in May 2022 during the SI ranged from 10.56 to 16.43 feet bgs. Therefore, the ingestion exposure pathway for future construction workers in areas where groundwater is shallow enough to encounter during construction activities is considered potentially complete. The CSM for AOI 1 is presented on **Figure 7-1**.

7.2.2 AOI 2

PFOA, PFOS and PFHxS were detected above their SLs in groundwater samples collected at AOI 2. The public water systems within a 4-mile radius of Camp Shelby draw from deep confined aquifers that are not believed to be at risk of contamination from surface water or perched water tables (Slack et al., 2004); however, there are various shallow domestic wells screened as shallow as 30 feet downgradient of Camp Shelby. Therefore, the groundwater exposure pathway for off-facility residents is considered potentially complete. Drinking water to the facility is supplied from the lower sands of the Hattiesburg Formation. Therefore, the groundwater exposure pathways via ingestion of groundwater for on-facility residents, site workers, and trespassers are considered incomplete. Depths to water measured at AOI 2 in May 2022 during the SI ranged from 23.19 to 23.49 feet bgs. Therefore, the ingestion exposure pathway for future construction workers is considered incomplete. The CSM for AOI 2 is presented on **Figure 7-2**.

7.2.3 AOI 3

PFOA and PFOS were detected above their SLs in groundwater samples collected at AOI 3. The public water systems within a 4-mile radius of Camp Shelby draw from deep confined aquifers that are not believed to be at risk of contamination from surface water or perched water tables (Slack et al., 2004); however, there are various shallow domestic wells screened as shallow as 30 feet downgradient of Camp Shelby. Therefore, the groundwater exposure pathway for off-facility residents is considered potentially complete. Drinking water to the facility is supplied from the lower sands of the Hattiesburg Formation. Therefore, the groundwater exposure pathways via ingestion of groundwater for on-facility residents, site workers, and trespassers are considered incomplete. Depths to water measured at AOI 3 in May 2022 during the SI ranged from 30.61 to 35.50 feet bgs. Therefore, the ingestion exposure pathway for future construction workers is considered incomplete. The CSM for AOI 3 is presented on **Figure 7-3**.

7.2.4 AOI 4

PFOS and PFBS were detected below their SLs in groundwater samples collected at AOI 4. The public water systems within a 4-mile radius of Camp Shelby draw from deep confined aquifers that are not believed to be at risk of contamination from surface water or perched water tables (Slack et al., 2004); however, there are various shallow domestic wells screened as shallow as 30 feet downgradient of Camp Shelby. Therefore, the groundwater exposure pathway for off-facility residents is considered potentially complete. Drinking water to the facility is supplied from the lower sands of the Hattiesburg Formation. Therefore, the groundwater exposure pathways via ingestion of groundwater for on-facility residents, site workers, and trespassers are considered incomplete. Depths to water measured at AOI 4 in May 2022 during the SI ranged from 28.51 to 33.32 feet bgs. Therefore, the ingestion exposure pathway for future construction workers is considered incomplete. The CSM for AOI 4 is presented on **Figure 7-4**.

7.2.5 AOI 5

PFOA, PFOS, and PFNA were detected below their SLs in groundwater samples collected at AOI 5. The public water systems within a 4-mile radius of Camp Shelby draw from deep confined aquifers that are not believed to be at risk of contamination from surface water or perched water tables (Slack et al., 2004); however, there are various shallow domestic wells screened as shallow as 30 feet downgradient of Camp Shelby. Therefore, the groundwater exposure pathway for off-facility residents is considered potentially complete. Drinking water to the facility is supplied from the lower sands of the Hattiesburg Formation. Therefore, the groundwater exposure pathways via ingestion of groundwater for on-facility residents, site workers, and trespassers are considered incomplete. Depths to water measured at AOI 5 in May 2022 during the SI ranged from 8.92 to 29.59 feet bgs. Therefore, the ingestion exposure pathway for future construction workers in areas where groundwater is shallow enough to encounter during construction activities is considered potentially complete. The CSM for AOI 5 is presented on **Figure 7-5.**

7.3 Surface Water and Sediment Exposure Pathway

The SI results in soil and groundwater, in combination with knowledge of the fate and transport properties of PFAS, were used to determine whether a potentially complete pathway exists between the source and potential receptors.

7.3.1 AOI 1

PFAS are water soluble and can migrate readily from soil to surface water via leaching and run-off. The relevant compounds were detected in soil and groundwater at AOI 1, and due to the exceedances of some soil and groundwater SLs, it is possible that those compounds may have migrated from soil and shallow groundwater to the cement drainage ditches that lead to Morris Branch, which drains to Geiger Lake. Therefore, the surface water and sediment ingestion exposure pathway for recreational users using Morris Branch or Geiger Lake is considered potentially complete for recreational users. The cement drainage ditches were dry at the time of the SI fieldwork; however, future site workers or future construction workers could contact constituents in surface water during wet periods. Therefore, the exposure pathways for site workers and construction workers to surface water via incidental ingestion are potentially complete. Municipal drinking water in Forrest and Perry Counties is not supplied by nearby surface water bodies (Mississippi Department of Health, 2022). Consequently, the residential exposure pathway is incomplete. The CSM for AOI 1 is presented on **Figure 7-1**.

7.3.2 AOI 2

PFOA, PFOS and PFHxS in groundwater exceeded their SLs at AOI 2, and PFOS in surface soil exceeded the SL. However, surface water and shallow groundwater at AOI 2 drain toward Hartfield Creek, a tributary of Davis Creek, which flows to the Black Creek. Recreational users using these water bodies may contact constituents in the surface water and sediment. Therefore, the surface water and sediment ingestion exposure pathways for recreational users are considered potentially complete for AOI 2. The stretches of Hartfield Creek and Davis Creek immediately downgradient of AOI 2 are off the facility property. Therefore, the exposure pathways for site workers and construction workers to surface water via incidental ingestion are incomplete. Municipal drinking water is not supplied by nearby surface water bodies. Consequently, the residential exposure pathway is incomplete. The CSM for AOI 2 is presented on **Figure 7-2**.

7.3.3 AOI 3

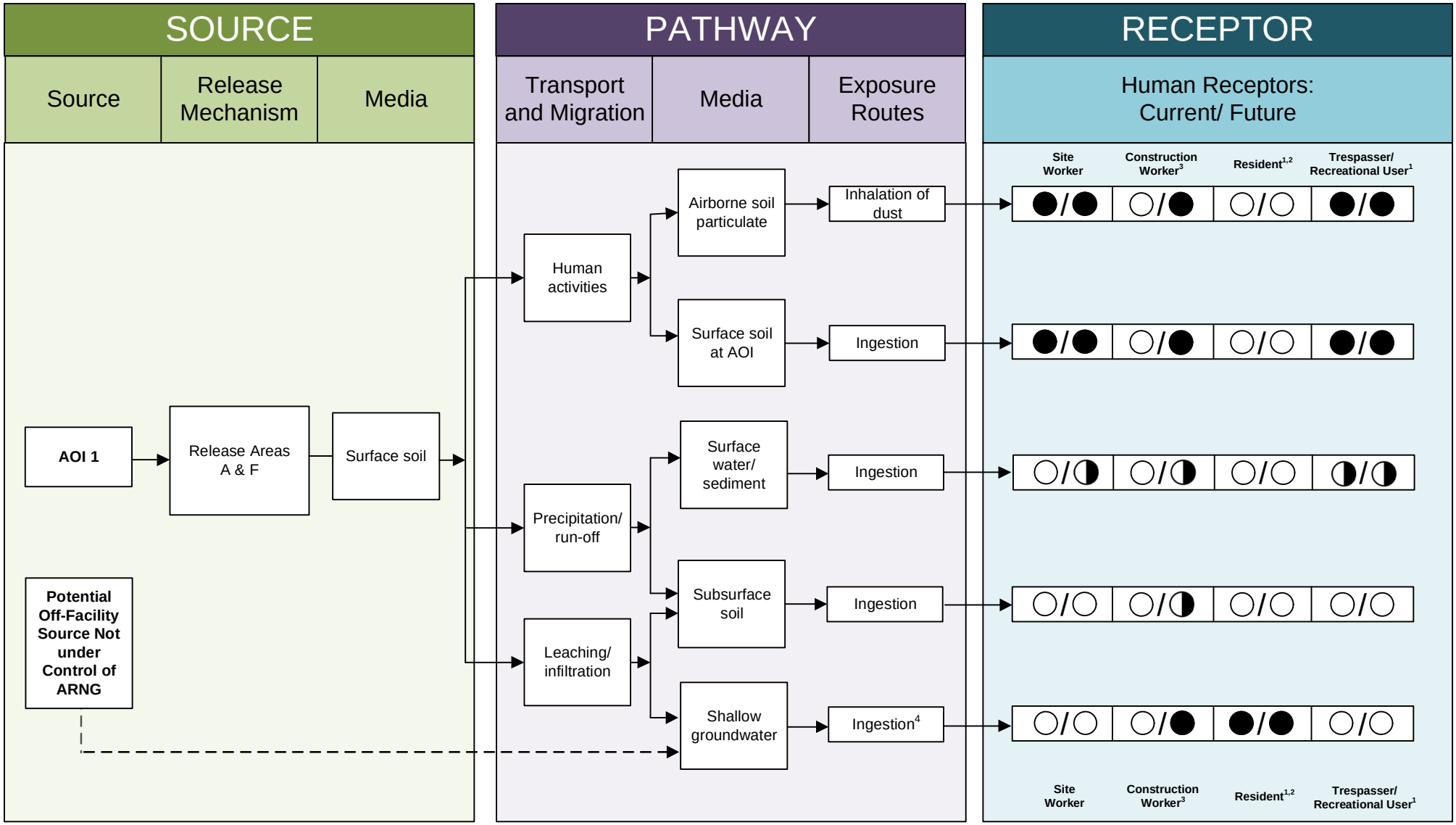
PFOA and PFOS in groundwater exceeded their SLs at AOI 3. The relevant compounds were detected in soil, below their SLs. Impacts to the soil and groundwater could migrate to the WWTP ponds. Site workers or future construction workers working at the WWTP could contact constituents in the water or sediment. Therefore, the exposure pathways to site workers and future construction workers are potentially complete. Additionally, overland flow and groundwater may flow to Walker Lake, which is downhill and west-northwest of AOI 3. Walker Lake is used primarily by active, reserve, and retired military members and their families for recreational activities, including fishing, swimming, and boating. Recreational users could contact constituents in surface water and sediment. Therefore, the surface water and sediment exposure pathways for recreational users using Walker Creek are considered potentially complete. Municipal drinking water is not supplied by nearby surface water bodies. Consequently, the residential exposure pathway is incomplete. The CSM for AOI 3 is presented on **Figure 7-3**.

7.3.4 AOI 4

AOI 4 is located on the boundary between two watersheds. Overland flow to the north would discharge to Walker Lake, while flow to the south would be conveyed to Hartfield Creek and ultimately Black Creek via cement drainage ditches. PFOS and PFBS in groundwater were detected below their SLs, and no relevant compounds were detected in soil in excess of their SLs at AOI 4. Therefore, the surface water and sediment ingestion exposure pathways for recreational users is considered potentially complete for AOI 4. The cement drainage ditches were dry at the time of the SI fieldwork; however, future site workers or future construction workers could contact constituents in surface water during wet periods. Therefore, the exposure pathways for site workers and construction workers to surface water via incidental ingestion are potentially complete. Municipal drinking water is not supplied by nearby surface water bodies. Consequently, the residential exposure pathway is incomplete. The CSM for AOI 4 is presented on **Figure 7-4**.

7.3.5 AOI 5

PFOA, PFOS, and PFNA in groundwater were detected below their SLs at AOI 5. Surface water and shallow groundwater at AOI 5 drain toward Davis Creek, a tributary of the Black Creek. Site workers, future construction workers, and recreational users working in or using Davis Creek could contact constituents. Therefore, the surface water and sediment exposure pathways for site workers, future construction workers, and recreational users are considered potentially complete. Municipal drinking water is not supplied by nearby surface water bodies. Consequently, the residential exposure pathway is incomplete. The CSM for AOI 5 is presented on **Figure 7-5**.



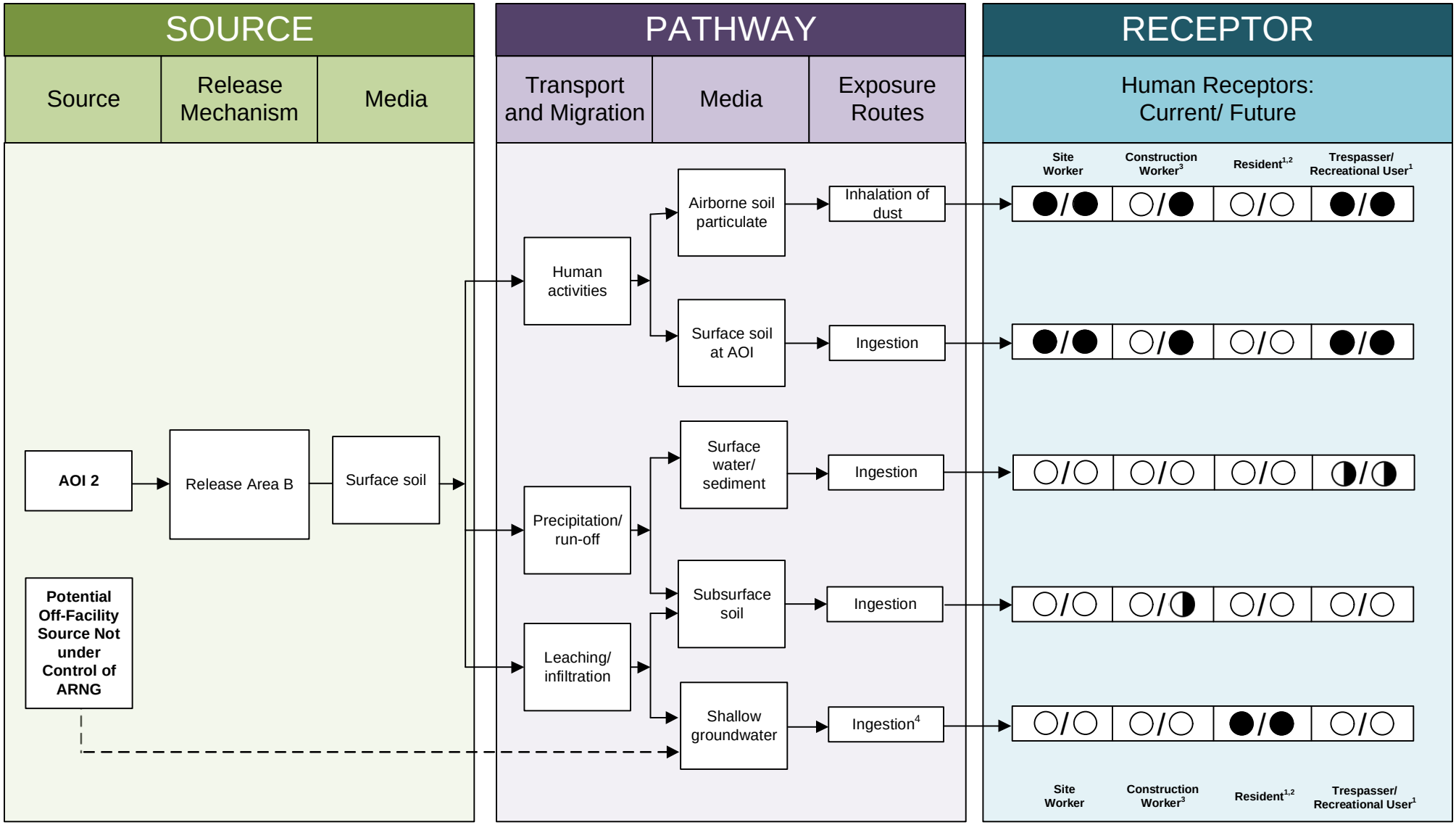
LEGEND

- Flow-Chart Stops
- 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 on- and off-facility receptors.
2. Inhalation of dust for off-site receptors is likely insignificant.
3. No current active construction at AOI 1.
4. Only the off-facility resident receptor is potentially complete for groundwater.

Figure 7-1
Conceptual Site Model, AOI 1
Camp Shelby Joint Forces Training Center



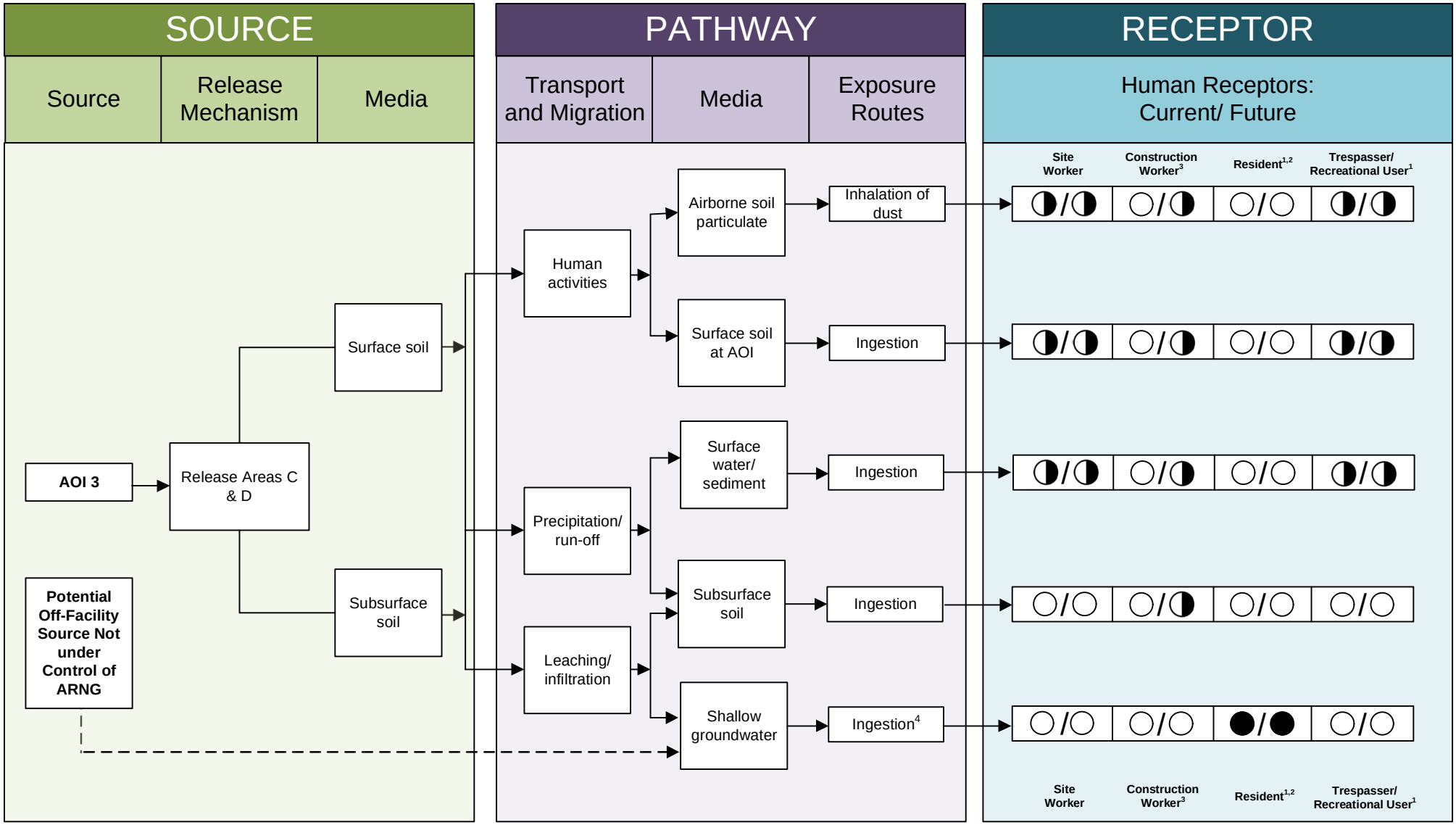
LEGEND

- Flow-Chart Stops
- 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 on- and off-facility receptors.
2. Inhalation of dust for off-site receptors is likely insignificant.
3. No current active construction at AOI 2.
4. Only the off-facility resident receptor is potentially complete for groundwater.

Figure 7-2
Conceptual Site Model, AOI 2
Camp Shelby Joint Forces Training Center



LEGEND

- Flow-Chart Stops
- 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 on- and off-facility receptors.
2. Inhalation of dust for off-site receptors is likely insignificant.
3. No current active construction at AOI 3.
4. Only the off-facility resident receptor is potentially complete for groundwater.

Figure 7-3
Conceptual Site Model, AOI 3
Camp Shelby Joint Forces Training Center

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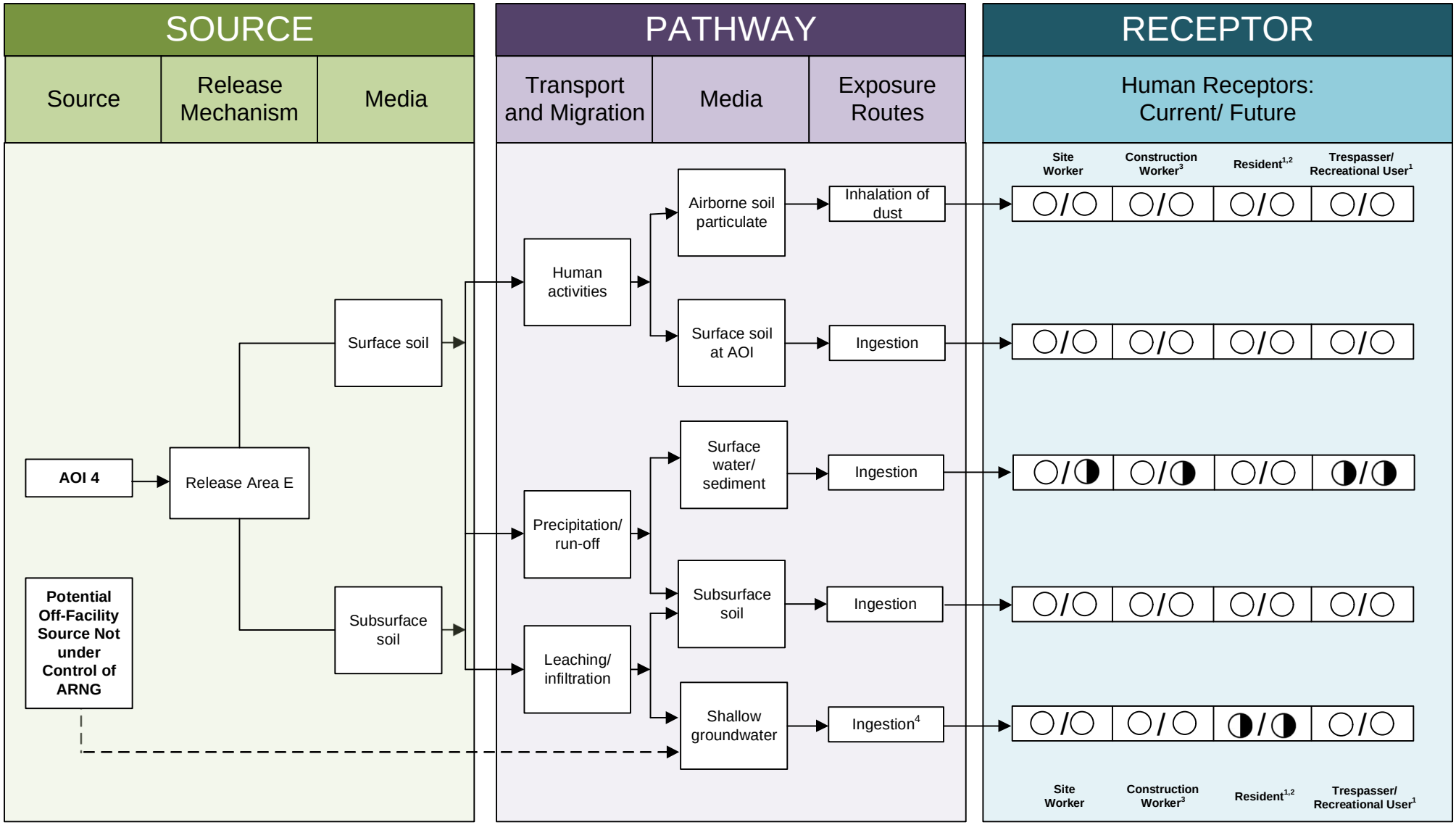


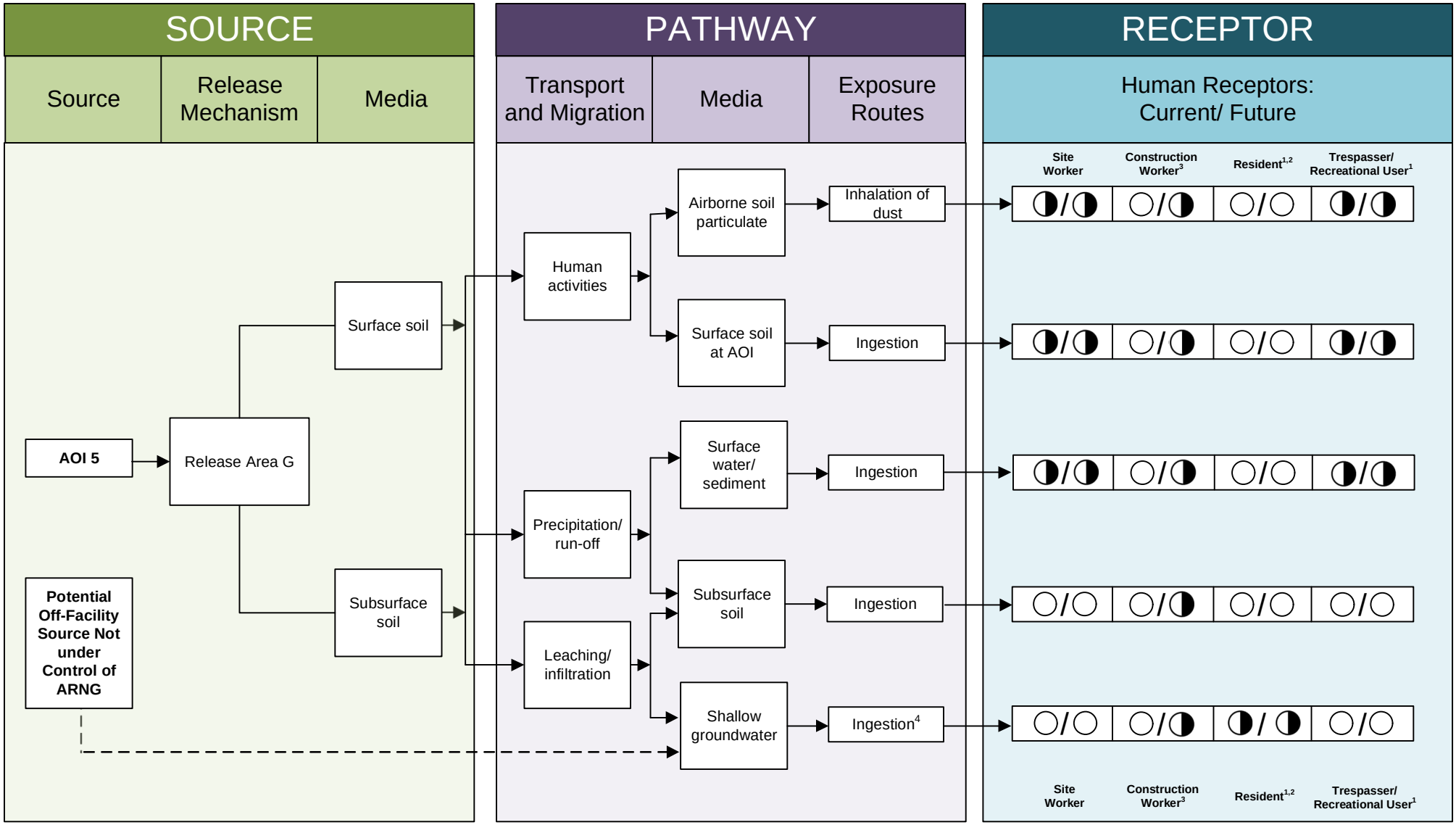
LEGEND

- Flow-Chart Stops
- 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 on- and off-facility receptors.
2. Inhalation of dust for off-site receptors is likely insignificant.
3. At the time of the SI, construction was occurring at AOI 4 to expand the fire station.
4. Only the off-facility resident receptor is potentially complete for groundwater.

Figure 7-4
Conceptual Site Model, AOI 4
Camp Shelby Joint Forces Training Center



LEGEND

- Flow-Chart Stops
- 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 on- and off-facility receptors.
2. Inhalation of dust for off-site receptors is likely insignificant.
3. No current active construction at AOI 5.
4. Only the off-facility resident receptor is potentially complete for groundwater.

Figure 7-5
Conceptual Site Model, AOI 5
Camp Shelby Joint Forces Training Center

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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 were conducted from 23 to 27 May 2022 and consisted of utility clearance, direct push boring, soil sample collection, temporary monitoring well installation and abandonment, grab groundwater sample collection, and land surveying. Field activities were conducted in accordance with the SI QAPP Addendum (AECOM, 2022a), except as noted in **Section 5.8**.

To fulfill the project DQOs set forth in the approved SI QAPP Addendum (AECOM, 2022a), samples were collected and analyzed for a subset of 18 compounds by LC/MS/MS compliant with QSM 5.3 Table B-15 as follows.

- Sixty (60) soil samples from 26 boring locations;
- Seventeen (17) grab groundwater samples from 17 temporary well locations;
- Thirty (30) 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 AOIs 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 CSMs were refined to assess whether a potentially complete pathway exists between the source and potential receptors for potential exposure at the AOIs, which are described in **Section 7**.

8.2 Outcome

Based on the results of this SI, further evaluation under CERCLA is warranted in an RI for AOI 1, AOI 2, and AOI 3; no further evaluation is warranted for AOI 4 and AOI 5 at this time (see **Table 8-1**). Based on the CSMs developed and revised in light of the SI findings, there is potential for exposure to drinking water receptors via unknown shallow private wells from AOI 1, AOI 2, and AOI 3 from sources on the facility resulting from historical DoD activities. Sample analytical concentrations collected during the SI were compared to 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:
    - PFOS in surface soil exceeded the SL of 13 µg/kg at location AOI01-01, with a concentration of 49.4 µg/kg. The detected concentrations of PFOA, PFHxS, PFNA, and PFBS in soil were below their SLs.
    - PFOA, PFOS, PFHxS, and PFNA in groundwater exceeded their SLs. PFOA exceeded the SL of 6 ng/L, with a maximum concentration of 84.3 ng/L at location AOI01-04. PFOS exceeded the SL of 4 ng/L, with a maximum concentration of 4,970 ng/L at location AOI01-03. PFHxS exceeded the SL of 39 ng/L, with a maximum concentration of 616 ng/L at location AOI01-01. PFNA exceeded the SL of 6 ng/L, with a maximum concentration of 18.4 ng/L at AOI01-04. Based on the results of the SI, further evaluation of AOI 1 is warranted in an RI.

- At AOI 2:
    - PFOS was detected in exceedance of the surface soil SL of 13 µg/kg, with a maximum concentration of 93.9 µg/kg observed at AOI02-04. The detected concentrations of PFOA, PFHxS, PFNA, and PFBS in soil were below their SLs
    - PFOA, PFOS, and PFHxS in groundwater exceeded their SLs. PFOA exceeded the SL of 6 ng/L, with a maximum concentration of 103 ng/L at location AOI02-02. PFOS exceeded the SL of 4 ng/L, with a maximum concentration of 2,960 ng/L at location AOI02-02. PFHxS exceeded the SL of 39 ng/L, with a maximum concentration of 1,720 ng/L at location AOI02-02. Based on the results of the SI, further evaluation of AOI 2 is warranted in an RI.
- At AOI 3:
    - The detected concentrations of the relevant compounds in soil were below their SLs.
    - PFOA and PFOS in groundwater exceeded their SLs. PFOA exceeded the SL of 6 ng/L at location AOI03-02, with a concentration of 9.45 ng/L. PFOS exceeded the SL of 4 ng/L at AOI03-02, with a concentration of 7.48 ng/L. Based on the results of the SI, further evaluation of AOI 3 is warranted in an RI.
- At AOI 4:
    - The relevant compounds were not detected in either surface or subsurface soil.
    - PFOS and PFBS were detected below the SL in groundwater. Based on the results of the SI, no further evaluation of AOI 4 is warranted.
- At AOI 5:
    - The detected concentrations of PFOA, PFOS, PFHxS, and PFNA in soil were below their SLs.
    - PFOA, PFOS, and PFNA were detected in groundwater below their SLs at AOI 5. Based on the results of the SI, no further evaluation of AOI 5 is warranted.

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	Future Action[1]
1	Release Areas A & F	●	●	Proceed to RI
2	Release Area B	●	●	Proceed to RI
3	Release Areas C & D	◐	●	Proceed to RI
4	Release Area E	○	◐	No further action
5	Release Area G	◐	◐	No further action

Notes:

1. If new information becomes available that could affect the recommendation regarding the future action for an AOI, or if the OSD SLs are revised, then the future action may be reevaluated.

AOI = Area of Interest; N/A = not applicable; RI = Remedial Investigation

Legend:

● = detected; exceedance of the screening levels

◐ = detected; no exceedance of the screening levels

○ = not detected

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