FINAL
Site Inspection Report
Army Aviation Support Facility #1
Ronkonkoma, New York

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

December 2023

Prepared for:

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

UNCLASSIFIED

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TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS AND ABBREVIATIONS

°C	Degrees Celsius
°F	Degrees Fahrenheit
%	Percent
µg/kg	Microgram(s) per kilogram
AASF	Army Aviation Support Facility
AECOM	AECOM Technical Services, Inc.
AFFF	Aqueous film-forming foam
amsl	Above mean sea level
AOI	Area of Interest
AOPC	Area of Potential Concern
ARNG	Army National Guard
bgs	Below ground surface
btoc	Below top of casing
CAMP	Community Air Monitoring Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSM	Conceptual site model
DoD	Department of Defense
DPT	Direct-push technology
DQO	Data Quality Objectives
DUA	Data Usability Assessment
EA	EA Engineering, Science, and Technology, Inc., PBC
EDR	Environmental Data Resources
ELAP	Environmental Laboratory Accreditation Program
EM	Engineer Manual
EB	Equipment blank
FB	Field blank
ft	Foot (feet)
HAZMAT	Hazardous Materials
HDPE	High-density polyethylene
HEF	High expansion foam
HFPO-DA	Hexafluoropropylene oxide-dimer acid
HQ	Hazard Quotient
IDW	Investigation-derived waste
ITRC	Interstate Technology Regulatory Council
LC/MS/MS	Liquid chromatography with tandem mass spectrometry

LIST OF ACRONYMS AND ABBREVIATIONS (continued)

MS	Matrix spike
MSD	Matrix spike duplicate
NELAP	National Environmental Laboratory Accreditation Program
ng/L	Nanogram(s) per liter
No.	Number
NYARNG	New York Army National Guard
OSD	Office of the Secretary of Defense
PA	Preliminary Assessment
PFAS	Per- and polyfluoroalkyl substances
PFBS	Perfluorobutanesulfonic acid
PFHxS	Perfluorohexanesulfonic acid
PFNA	Perfluorononanoic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
ppt	Part(s) per trillion
PVC	Polyvinyl chloride
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality control
QSM	Quality Systems Manual
RI	Remedial Investigation
SCR	Site Characterization Report
SCWA	Suffolk County Water Authority
SI	Site Inspection
SL	Screening level
TOC	Total organic carbon
TPP	Technical Project Planning
UFP	Uniform Federal Policy
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey

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EXECUTIVE SUMMARY

The Army National Guard (ARNG) G9 is performing Preliminary Assessments (PAs) and Site Inspections (SIs) at ARNG facilities nationwide based on the current or potential historical use of per- and polyfluoroalkyl substances (PFAS) with a focus on the six compounds presented in the memorandum from the Office of the Secretary of Defense (OSD) (Assistant Secretary of Defense) dated 6 July 2022. The six compounds listed in the OSD memorandum include perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), and perfluorobutanesulfonic acid (PFBS), perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PFHxS), and hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)[1]. These compounds are collectively referred to as "relevant compounds" throughout the document and the applicable Screening Levels (SLs) are provided below in Table ES-1.

The PA identified one Area of Interest (AOI), Ronkonkoma AASF #1 Hangar Release and Aqueous Film-Forming Foam (AFFF) Storage, where PFAS-containing materials may have been used, stored, disposed, or released historically (see table ES-2 for AOI location). 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 a comparison of SI results to screening levels (SLs) for the relevant compounds. This SI was completed at the Army Aviation Support Facility (AASF) #1 in Ronkonkoma, New York and determined no further investigation is warranted. Ronkonkoma AASF #1 will be referred to as the "Facility" throughout this document.

The Facility, which is operated by New York ARNG (NYARNG), encompasses approximately 1.5 acres. The Facility is located adjacent to the Long Island MacArthur Airport and is owned by the Town of Islip in Ronkonkoma, New York, on Long Island. The Ronkonkoma AASF #1 has one hangar that the NYARNG began operating in 1977, located in the southwest portion of the Long Island MacArthur Airport. The Facility lies within Suffolk County, between Montauk Point (72 miles east) and Manhattan (60 miles west). Suffolk County is a predominantly suburban area in the Atlantic Coastal Plain. The terrain is generally hilly and is composed of thick glacial till-plain and end moraine deposits. Lake Ronkonkoma is 2.69 miles to the north, and the Great South Bay is located approximately 5 miles to the south (AECOM Technical Services, Inc. [AECOM] 2020).

The PA identified one AOI for investigation during the SI phase. SI sampling results from the AOI and facility boundary were compared to OSD SLs. Exceedances of the SLs in groundwater onsite appear to be migrating from upgradient, offsite sources not under the control of ARNG. These off-site, up/cross-gradient concentrations demonstrate a plume with substantial

[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.

concentrations of relevant compounds is present within the Airport complex in the vicinity of the Facility and is entering the Ronkonkoma AASF #1 on its northeastern side. Table ES-2 summarizes the SI results for the AOI 1. Based on the results of this SI, no further evaluation by the ARNG under CERCLA is warranted for the AOI identified.

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

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

Notes:

1. Assistant Secretary of Defense, 2022. Risk-Based Screening Levels in Groundwater and Soil using U.S. Environmental Protection Agency's (USEPA's) Regional Screening Level Calculator. Hazard Quotient (HQ)=0.1. 6 July 2022.
2. Of the six PFAS compounds presented in the 6 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not included as an analyte at the time of this SI. Based on the 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.

µg/kg = Microgram(s) per kilogram
ng/L = Nanogram(s) per liter

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

AOI	Potential Release Area	Soil AOI	Groundwater AOI	Groundwater Facility Boundary	Future Action
1	Ronkonkoma AASF #1 Hangar Release and AFFF Storage	◐	●	●	No further action by ARNG

Legend:

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

1. INTRODUCTION

1.1 PROJECT AUTHORIZATION

The Army National Guard (ARNG) G9 is the lead agency in performing Preliminary Assessments (PAs) and Site Inspections (SIs) at ARNG facilities nationwide based on the current or potential historical use of per- and polyfluoroalkyl substances (PFAS) with a focus on 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 perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), perfluorobutanesulfonic acid (PFBS), perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PFHxS), and hexafluoropropylene oxide-dimer acid (HFPO-DA)[2] at ARNG facilities nationwide. The ARNG performed this SI at the Army Aviation Support Facility (AASF) #1 in Ronkonkoma, New York. The AASF #1 will be referred to as the "Facility" throughout this report.

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

1.2 SITE INSPECTION PURPOSE

A PA was performed at Ronkonkoma AASF #1 (AECOM Technical Services, Inc. [AECOM] 2020) that identified a single potential Area of Interest (AOI) where PFAS-containing materials may have been used, stored, disposed, or released historically. The objective of the SI is to identify whether there has been a release to the environment from the AOI identified in the PA and determine whether further investigation is warranted, a removal action is required to address immediate threats, or no further action is required based on screening levels (SLs) for the relevant compounds.

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

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2. FACILITY BACKGROUND

2.1 FACILITY LOCATION AND DESCRIPTION

Ronkonkoma AASF #1 is located adjacent to the Long Island MacArthur Airport (**Figure 2-1**) and is owned by the Town of Islip in Ronkonkoma, New York, on Long Island. The Facility lies between Montauk Point (72 miles east) and Manhattan (60 miles west) and is a part of Suffolk County. Interstate 495 is 1.85 miles to the north of the Facility, Lake Ronkonkoma is 2.69 miles to the north, and the Great South Bay is located approximately 5 miles to the south.

The Long Island MacArthur Airport (formerly known as Islip Airport) was built in 1944 by Lockheed Aircraft Corporation and consisted of three paved runways. Through the 1950s, Long Island MacArthur Airport served as an aerospace research facility; it first began operating as a commercial airport in 1960 and now covers approximately 1,311 acres with four runways and two helipads (AECOM 2020).

Ronkonkoma AASF #1 has one hangar that the New York ARNG (NYARNG) began operating in 1977. The hangar is located in the southwest portion of the Long Island MacArthur Airport and covers approximately 62,162 square feet (ft). Aerial photographs obtained for the Preliminary Assessment (AECOM 2020) show that the hangar was built sometime between 1966 and 1980. The NYARNG began operations at this location in 1977. Ronkonkoma AASF #1 is owned by the Town of Islip, which also owns the adjacent Long Island MacArthur Airport complex (Arcadis 2022).

2.2 FACILITY ENVIRONMENTAL SETTING

The Facility is located within Suffolk County which encompasses the eastern portion of Long Island and adjacent islands in New York. Suffolk County is a predominantly suburban area and is comprised of a total of 2,373 square miles, 62 percent (%) of which is water (U.S. Census 2010). More specifically, the Facility is located within the Town of Islip, hamlet of Ronkonkoma. The Facility and the larger MacArthur Airport complex are located in a mixed-use area with a mix of commercial, industrial, and residential abutters. The nearest residence to the Facility is less than 0.5 miles southwest. There are several State and County parks within the vicinity of the Airport, as well as the Atlantic coastline approximately 5 miles to the south. The terrain is generally low rolling hills (**Figure 2-2**).

2.2.1 Geology

Ronkonkoma and the Town of Islip lie within the Atlantic Coastal Plain physiographic province and may be further subdivided into a small northern region of asymmetrical hills and a large southern region composed of a broad, gently sloping plain. During the Pleistocene period, glacial meltwater deposited outwash material forming what is presently known as the Upper Glacial aquifer comprised of unstratified clay, coarse sand, gravel, and boulders (United States Geological Survey [USGS] 1974).

The region of irregular hills coincides with the distribution of geologic units mapped as the Ronkonkoma and Harbor Hill terminal-moraines. The terminal moraines are two ridges marking

the maximum advance of continental glaciers that formed the backbone of Long Island and are a direct continuation of Wisconsin age moraines stretching almost continuously from the Rocky Mountains to New Jersey and through Long Island (USGS 1974).

The outwash plain caused by the intermorainal belt between the ridges produced surficial deposits of sand and gravel laid down by melt-water streams. The Ronkonkoma AASF #1 area lies in the western portion within this outwash plain and is predominantly underlain by unconsolidated Pleistocene glacial sediments and gravel known as the Upper Glacial deposits. Below this plain is the Magothy formation, consisting of Cretaceous age deltaic and marine deposits. The Magothy formation overlies the Raritan confining clay unit, which separates the Magothy from the Lloyd Sand Member, also of Cretaceous age (USGS 1974, 1998a).

The soils at Ronkonkoma AASF #1 are identified as cut and fill and Riverhead sandy loam (Natural Resources Conservation Service 2022). These soils have generally high permeability, and they are moderately to well drained. Soils surrounding the Facility include Riverhead sandy loam and Plymouth loamy sand with high infiltration rates. Soils are deep, well drained to excessively drained sands and gravels. The soils encourage infiltration and feed development of a surface aquifer (USGS 2009).

During the SI, the soil underlying the Facility was found to be comprised of well graded sand and gravel between the ground surface and the maximum exploration depth of 52 ft below grade. The orangey-tan sands observed ranged from fine to coarse with varying amounts of gravel and little to no fines. Lithology was consistent across the nine borings advanced during the SI.

2.2.2 Hydrogeology

Regional and local groundwater flow follow a surface drainage pattern that is dominated by the Harbor Hill and Ronkonkoma terminal-moraines, where elevation is the highest on Long Island (around 400 ft above mean sea level). These moraines serve as regional groundwater divides. Water moves freely in a shallow groundwater subsystem due to unconsolidated soils having little to no clay coupled with underlying beds of coarse sand and gravel. This subsystem provides a system of high infiltration for recharge of groundwater and discharge to the surrounding lakes and streams of the Ronkonkoma AASF #1 through precipitation. Precipitation is the sole source of recharge to the aquifers on Long Island (USGS 1998b).

Although soils are readily permeable, infiltration (and therefore aquifer recharge) is limited during parts of the year due to weather conditions and urbanization of Long Island. Urbanization, coupled with the area's characteristic short but intense rainstorms, results in high surface runoff. Additionally, during the summer months, annual evapotranspiration rates of 20-22 inches are nearly equal to the annual precipitation rate of 22-24 inches. Little to no evapotranspiration occurs in winter months, and winter storms are characterized by long, steady precipitation of rain, snow, and ice that tend to produce less surface runoff and more recharge than summer storms (USGS 1998a).

The groundwater system of Long Island is comprised of three aquifers which are generally stacked vertically. The shallowest of the three is the unconfined Upper Glacial aquifer, which is approximately 700 ft thick and contains the water table throughout most of the island. The

underlying aquifer, the Magothy aquifer, is the largest hydrogeological unit in the groundwater reservoir at 1,000 ft thick and is recharged by downward movement of water from the overlying Upper Glacial aquifer. Clay in the upper half of the Magothy causes the water to become increasingly confined with depth. The Lloyd aquifer is the basal unit of the groundwater reservoir and ranges from 0 ft thick to more than 500 ft thick. The Magothy aquifer is the principal source of water supply on Long Island for the past 50 years due to contamination concerns in the Upper Glacial aquifer (USGS 1998a, 1998b).

The Ronkonkoma AASF #1 is situated above all three aquifers, though the investigations described herein were limited to the Upper Glacial aquifer. Information gathered from the SI indicates local groundwater flow direction is to the southwest over the Facility, generally in the direction of the Great South Bay (**Figures 2-3**). Depth to groundwater measured during the SI field activities in November 2021 ranged from approximately 42 to 45 ft below ground surface (bgs) (**Figure 2-5**).

The PA included an Environmental Database Report (EDR)™ search for wells within a 1-mile radius surrounding the Facility. Using additional online resources, such as state and local Geographic Information Systems databases, wells were researched to a 4-mile radius of the Facility. Although no wells exist at Ronkonkoma AASF #1, data from the USGS National Water Information System Mapper indicate there are six active monitoring wells within a 4-mile radius of the Facility. Numerous additional inactive USGS monitoring wells were also identified within 4 miles, as shown on **Figure 2-3**. Numerous potential private wells are located within a 4-mile radius of the Facility per the results of the Suffolk County Department of Health Services 2017 survey (AECOM 2020). A subset of these are shown on **Figure 2-3**.

Long Island MacArthur Airport and the Ronkonkoma AASF #1 obtain drinking water through the Suffolk County Water Authority (SCWA). The SCWA water supply wells are set within the Magothy aquifer formation. As with all public water supplies, this water is tested and treated prior to distribution. On 27 July 2016 the SCWA found PFOS at a level of 95 parts per trillion (ppt) in a water sample from their Church Street Well #2 in Bohemia (located approximately 1.5 miles south of MacArthur Airport and Ronkonkoma AASF #1). SCWA began treating raw water with granulated activated carbon in 2005 and subsequently began blending that treated water with water from Church Street Well #3. As a result of this impact to the SCWA wellfield, the Suffolk County Department of Health Services undertook a private well survey of the area south of MacArthur Airport and Ronkonkoma AASF #1 in 2017. They identified 57 properties potentially utilizing private wells but were only able to arrange to sample seven of these private wells. Three of the wells had PFOS/PFOA at levels above the New York State maximum contaminant level. An additional two wells exceeded the USEPA Health Advisory at the time of the study[3], with the highest concentration being 673 ppt combined (AECOM 2020).

2.2.3 Hydrology

The Ronkonkoma AASF #1 is situated on the western side of the Brown Creek-Great South Bay Watershed (**Figure 2-4**). This watershed is also part of the much larger Southern Long Island

[3] At the time of the study, the Health Advisory level was 70 ppt for PFOS and PFOA, individually or combined.

Watershed, which covers 1,310,204 acres, all of which lie in the Atlantic Coastal Plain (U.S. Department of Agriculture 2011).

There are no surface water bodies within or in the immediate vicinity of the Ronkonkoma AASF #1. A majority of the surfaces within the AASF are impervious. Stormwater is conveyed to onsite stormwater infiltration features (dry wells and infiltration galleries) to the west and south of the hangar, surrounding the apron. Stormwater subsequently infiltrates to groundwater from these features in the subsurface. During a SI reconnaissance, two dry wells, which receive surface drainage, were confirmed to be present within the northwest and southwest portions of AASF. Furthermore, a review of utility plans from 2011 indicated the old storm line that courses under the hanger is capped to the west, there is an underground stormwater retention system approximately 50 feet south of the hanger, and several sumps concentrated in the impervious areas in the southeast portion of the facility.

The neighboring watershed, the Connetquot River Watershed, is the location of Connetquot Brook, which begins 5 miles northwest of the Ronkonkoma AASF #1, just south of Interstate 495, and travels south before it connects with four other tributaries to create the Connetquot River. Ludlows Creek is just 0.75 miles east from the Connetquot River, where they converge at an inlet before immediately emptying into the Great South Bay. Lake Ronkonkoma, 2.95 miles northwest of the Ronkonkoma AASF #1, is part of the Connetquot River watershed. However, it does not drain into any surrounding stream, tributary or other body of water and is completely recharged through groundwater (USGS 1998a).

2.2.4 Climate

Suffolk County is located within the major climate zone called Moist Subtropical Mid-Latitude Climate. This climate zone covers the majority of the southern and eastern United States and is characterized by warm and humid summers with mild winters. Convective thunderstorms dominate the summer months (National Weather Service 2022). The nearby Long Island MacArthur Airport weather station has recorded local weather since 1963. According to this weather station, the area has an average annual temperature of 53.1 degrees Fahrenheit (°F) with average high of 61.1°F to average lows of 45.2°F (National Oceanic and Atmospheric Administration 2018). The annual average wind speed is 9 miles per hour. The total mean annual precipitation is 45.99 inches (National Weather Service 2021).

2.2.5 Current and Future Land Use

The Ronkonkoma AASF #1 hangar has been the primary aviation training center for the NYARNG since the 1970s, and it is home to several aviation battalion and aviation support units from different parts of New York state, including Rochester. The training mostly consists of flying joint missions with National Guard units from other states, exercises in rescue operations for natural disasters, and pilot “extraction” training. The entire Facility is bounded by a fence and the Facility is accessed via a secured gate. There are no current expansion plans for the Facility and, in general, the future use of the Facility is not expected to change (AECOM 2020).

2.2.6 Sensitive Habitat and Threatened/Endangered Species

A wildlife survey has not occurred at the Facility, and the Facility does not have any significant areas of habitat. The following species have not been identified at the Facility but may be present in the surrounding area. The following species are listed as federally endangered, threatened, proposed, and/or candidate species in Suffolk County, New York (U.S. Fish and Wildlife Service 2021):

- Birds: Piping Plover – *Charadrius melodus* (Threatened), Red Knot – *Calidris canutus rufa* (Threatened), Roseate Tern – *Sterna dougallii* (Endangered)
- Flowering Plants: Sandplain Gerardia – *Agalinis acuta* (Endangered), Seabeach Amaranth – *Amaranthus pumilus* (Threatened)
- Insects: Monarch Butterfly – *Danaus plexippus* (Candidate)
- Mammal: Northern Long-eared Bat – *Myotis septentrionalis* (Threatened).

2.3 HISTORY OF PFAS USE

Aqueous film-forming foam (AFFF), a firefighting agent, was commonly used by the U.S. military to extinguish petroleum fires, for firefighting training, and for the suppression of fires in uncontained areas. Military use of AFFF began in the 1970s and was most widely used at Department of Defense (DoD) installations with airfields. One potential PFAS release area was identified at the Facility during the PA (AECOM 2020). Interviews and records obtained during the PA indicate that a release of AFFF occurred during an initial test of the hangar fire suppression system in 2007. This material was reportedly collected and disposed of off-site. It should be noted that during the SI field activities, ARNG personnel verified the system that was installed and tested in 2007 contained Jet-X™ high expansion foam (HEF), not AFFF. A set of 2004 constructions plans obtained as part of a recent records review further supported the installation of a new Jet-X™ system (not a retrofit) and the removal of an old Halon fire suppression system. Construction and repair plans associated with the system have been added as **Appendix H**. The formulation of Jet-X™ is proprietary; therefore, the presence of fluorinated compounds is not known. However, HEF releases are not known to result in concentrations of the relevant compounds that exceed their respective criteria based on the information available at the time of reporting. It was reported that AFFF was not used in fire training activities conducted at the Facility. Additionally, AFFF is present withing the main hangar (northern bay) stored in two 36-gallon manual floor units which have never been tested or used (per multiple facility interviews). No information is available in regard to how long the manual floor units have been present, but it is suspected that they have been in place since 2007. Furthermore, a review of the construction plans for the Jet-X fire suppression system does not show the units being present between 1970 and 2007.

It should be noted that annual NYARNG fire extinguisher training is performed jointly with the fire department at the AASF in a designated area just south of the AOI. However, according to interviews conducted with fire department personnel during the development of the PA, those activities do not use AFFF. Furthermore, only handheld ABC dry chemical extinguishers (not

AFFF extinguishers), are known to be equipped on site. Because AFFF is not used in the training, this FTA is not considered a potential release area. A description of the AOI is presented in Section 3.

Army National Guard Site Inspections
Site Inspection Report
Ronkonkoma AASF #1, New York

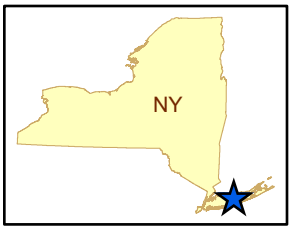
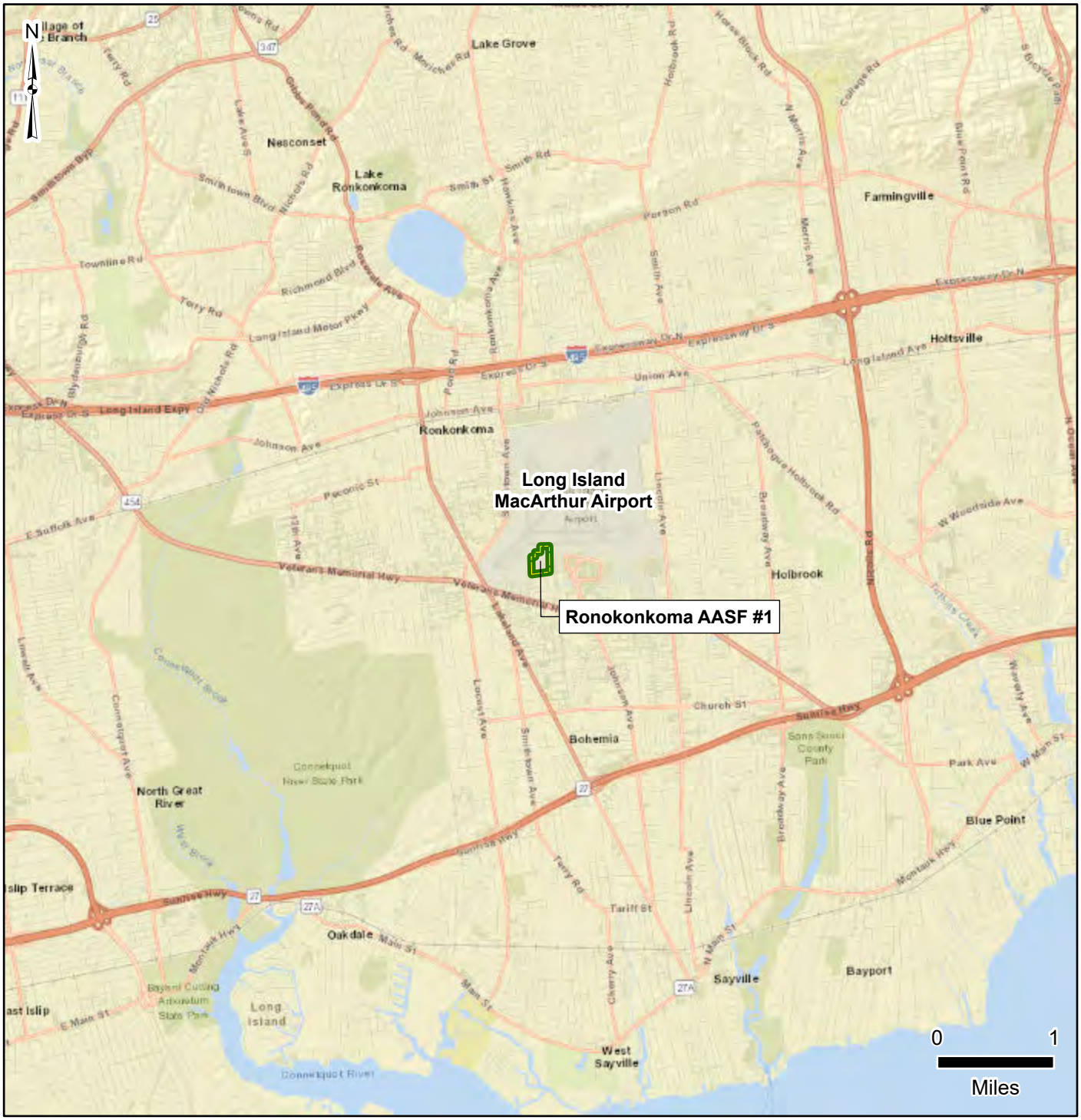


Figure 2-1
Facility Location



Facility Data

Facility Boundary

Data Sources:
ESRI 2022
AECOM 2020

Date:.....December 2023
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 18N

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Army National Guard Site Inspections
Site Inspection Report
Ronkonkoma AASF #1, New York

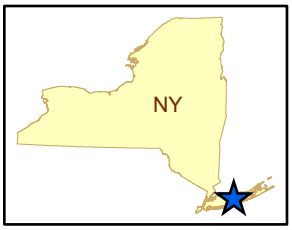
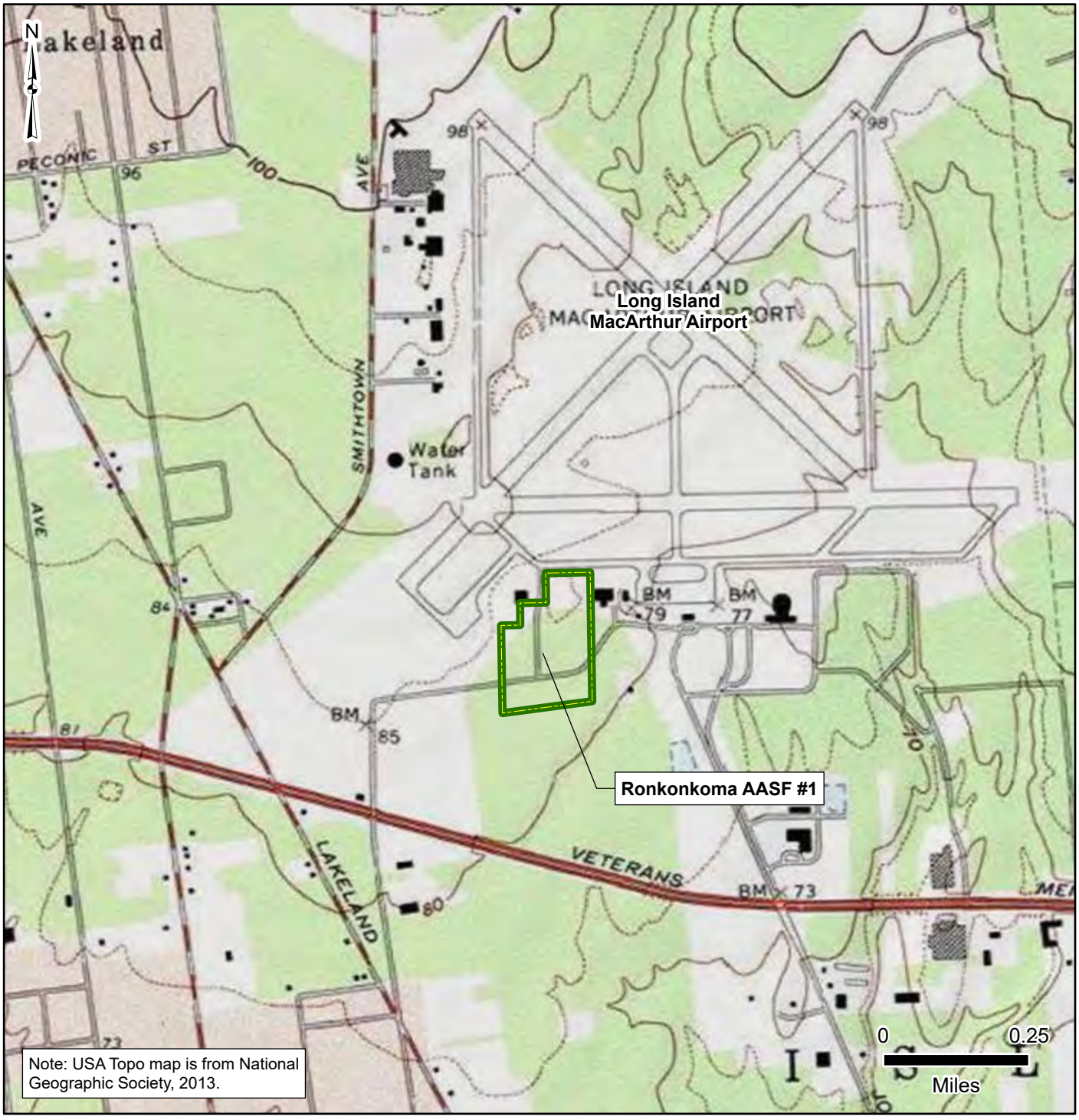


Figure 2-2
Topography



Note: USA Topo map is from National Geographic Society, 2013.

Facility Data

Facility Boundary

Data Sources:
ESRI 2022
AECOM 2020

Date:.....December 2023
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 18N

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Army National Guard Site Inspections
Site Inspection Report
Ronkonkoma AASF #1, New York

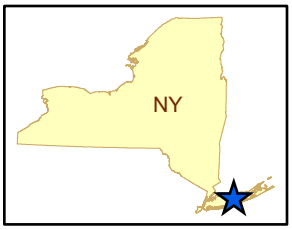
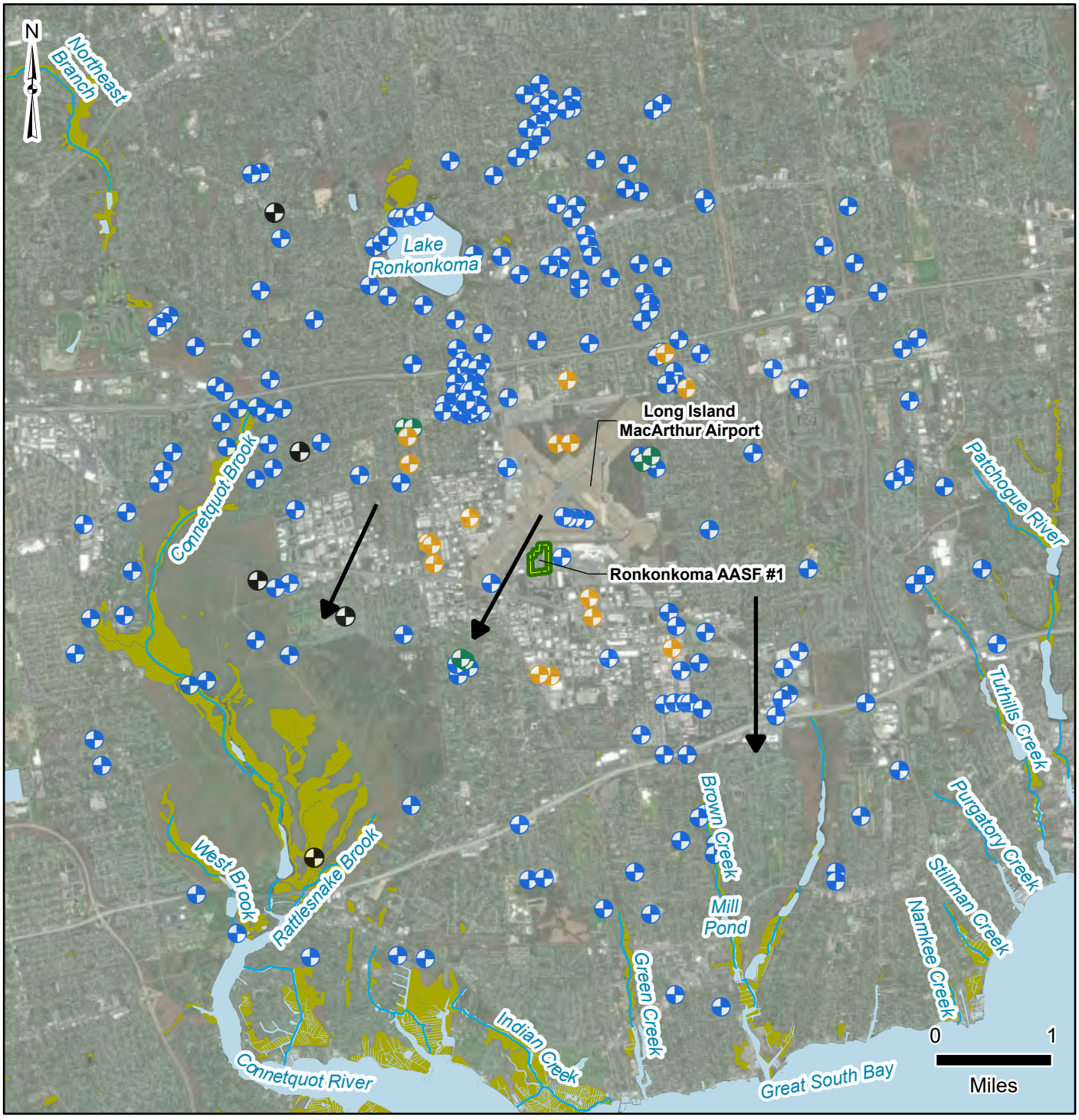


Figure 2-3
Groundwater Features



Facility Data
- Facility Boundary

Well Type
- Active USGS Monitoring Well
- Inactive USGS Monitoring Well
- Public Well
- Potential Private Well

Hydrology/Hydrogeology
- Groundwater Flow Direction
- Perennial Creek/Stream
- Wetlands
- Waterbody

Data Sources:
ESRI 2022
AECOM 2020

Date:.....December 2023
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 18N

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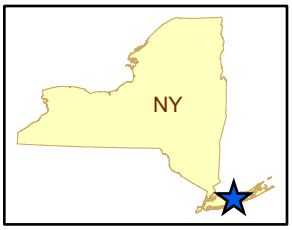
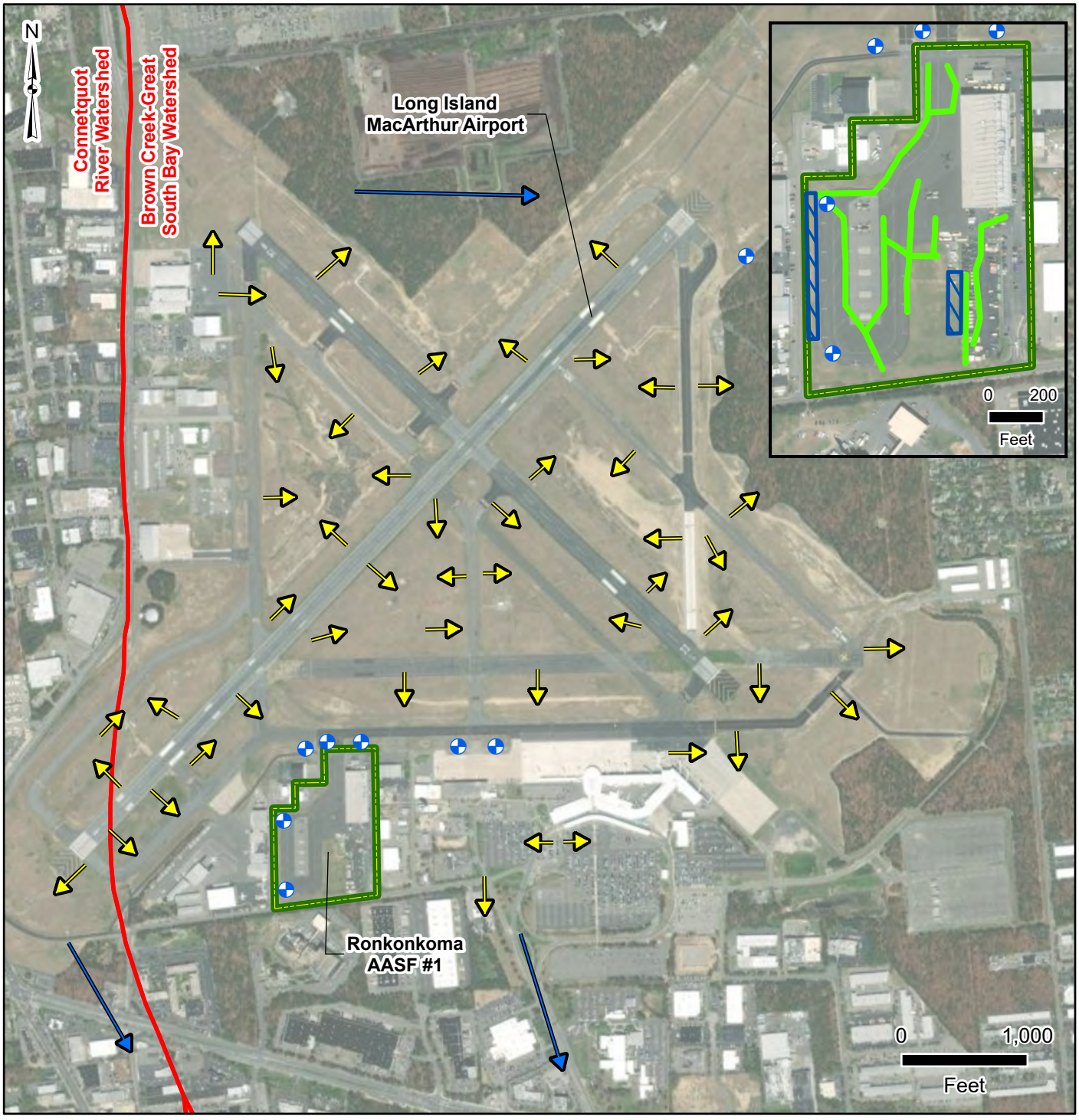
Army National Guard Site Inspections
Site Inspection Report
Ronkonkoma AASF #1, New York

Figure 2-4
Surface Water Features





Facility Data
- Facility Boundary

Hydrology/Hydrogeology
- Dry Well Location
- Stormwater Flow Direction
- Inferred Sheet Flow
- Stormwater Conveyance
- Infiltration Gallery
- Watershed Boundary

Note:
Stormwater flow direction obtained from the Final Long Island MacArthur Airport Records Search Report - Arcadis. 2019. Records Search Report, Long Island MacArthur Airport 100 Arrival Ave, Ronkonkoma NY. Final. August.

Data Sources:
ESRI 2022
AECOM 2020

Date:.....December 2023
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 18N

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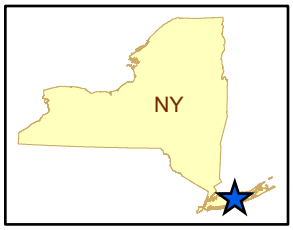
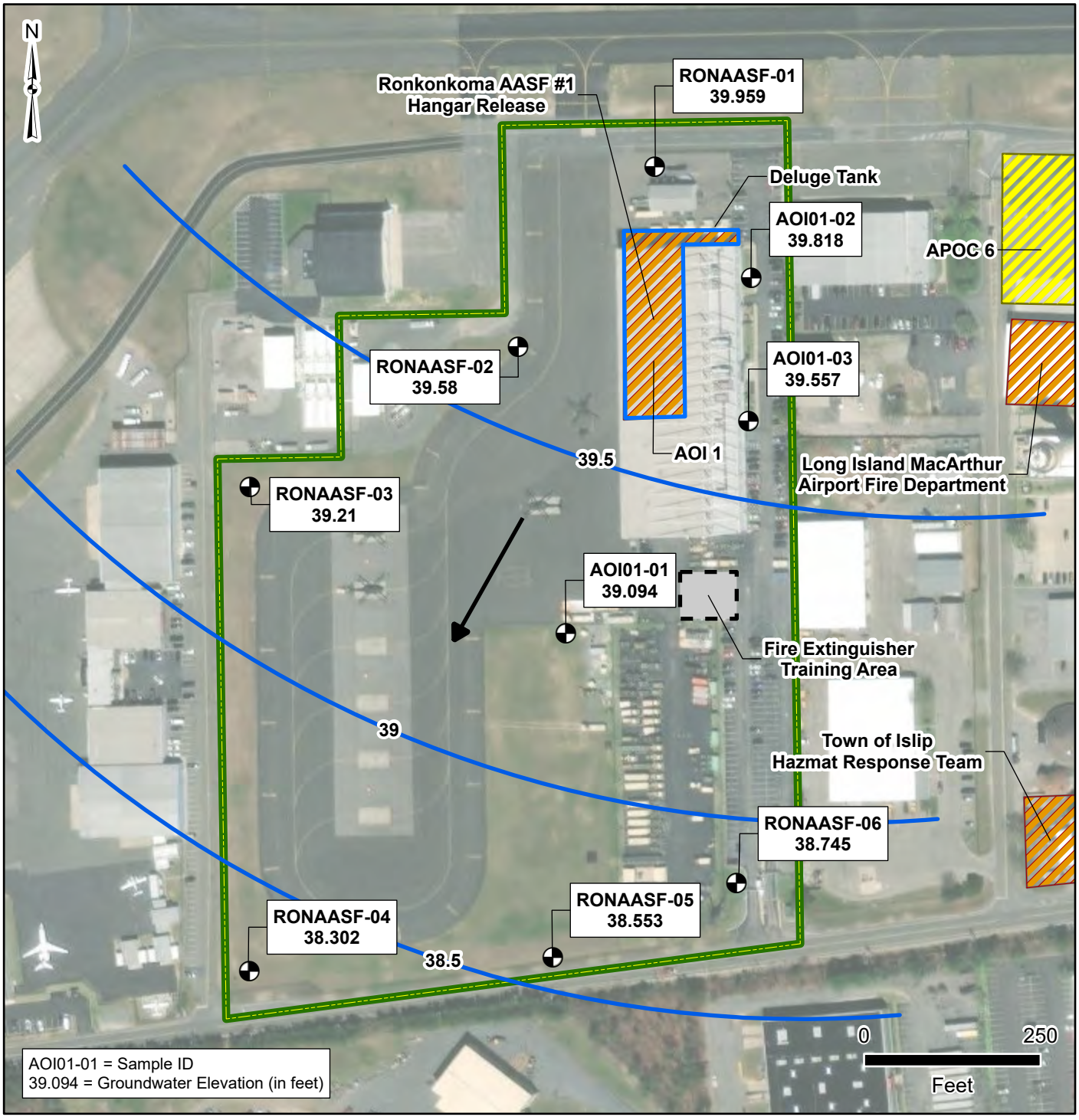
Army National Guard Site Inspections
Site Inspection Report
Ronkonkoma AASF #1, New York

Figure 2-5
Groundwater Elevations





Facility Data
- Facility Boundary
- Area of Interest
- Area of Potential Concern
- Potential PFAS Release
- No Suspected Release

Hydrogeology
- Well Location
- Groundwater Flow Direction
- Groundwater Elevation Contour Interval (0.5 foot)

Data Sources:
ESRI 2022
AECOM 2020

Date:.....December 2023
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 18N

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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. This may include fire training areas, buildings with fire suppression systems, paint booths, AFFF storage areas, and areas of compliance demonstrations. Based on the PA findings, one potential release area was identified at AOI 1 – Ronkonkoma AASF #1 Hangar Release and AFFF Storage. The location of AOI 1 is shown on **Figure 3-1**. Additionally, there are off-Facility potential source areas as detailed in **Section 3.2**.

3.1 AOI 1 – RONKONKOMA AASF #1 HANGAR RELEASE AND AFFF STORAGE

AOI 1 consists of the Ronkonkoma AASF #1 Hangar Release and AFFF Storage. The Ronkonkoma AASF #1 hangar was built between 1966 and 1980. The NYARNG moved to the location in the 1970s. According to the PA, in 2007, the hangar was equipped with a fire suppression deluge system containing 3% Ansul AFFF high expansion foam. There was no hangar-wide fire suppression system prior to this 2007 installation (AECOM 2020). Based on the identification of this AFFF system and potential release during testing, this SI was initiated. However, during the SI field activities, ARNG personnel verified the deluge system contains Jet-X ™ HEF, and never contained AFFF. No conclusive information regarding the presence of fluorinated compounds in HEF is known; it is unlikely to result in concentrations of the relevant compounds that exceed their respective criteria based on the information available at the time of reporting including ARNG sampling at facilities where solely Jet-X HEF has been released. AFFF is present at the hangar stored in two 36-gallon manual floor units which have never been tested or used (per multiple facility interviews).

The potential release scenario described in the PA was a test of the deluge system in 2007 shortly after its installation in 2007. Both of the 500-gallon deluge system tanks were used in the test, though the actual quantity of foam released was unknown. The hangar is divided into different sections and only a small area of the hangar was involved and affected by the deluge system test. The foam was flushed with water into the steel-lined draining trench and drained out to the underground deluge storage tanks and was then pumped into a truck and transported off-site for disposal. NYARNG staff stated, with no evidence to the contrary, that all foam was properly contained, and the deluge system test was successfully drained and pumped out of the Facility with no spillage or leakage (AECOM 2020).

As indicated, new information indicates that the test of the deluge system is unlikely to have resulted in a release of PFAS based on the type of HEF within the tanks. However, due to the uncertainty in the Jet-X ™ formulation, the presence of AFFF on-site in the floor units, the potential for undocumented spills or leaks, and the fact that the SI was underway prior to this revelation, the SI was completed even without a known/suspected release mechanism.

3.2 ADJACENT SOURCES

Four potential off-Facility sources of PFAS are adjacent to the Facility and are not under the control of the NYARNG. A description of each off-facility source is presented below and shown

on **Figure 3-1**[4]. Potential off-Facility sources identified in the ARNG PA are depicted as orange hatching on **Figure 3-1**, while off-Facility sources identified by the Long Island MacArthur Airport's own consultant (Section 3.2.4) are depicted as yellow hatching on **Figure 3-1**.

3.2.1 Long Island MacArthur Airport Fire Department

The Long Island MacArthur Airport Fire Department lies approximately 300 ft northeast of the Ronkonkoma AASF #1 and at the northern end of Clark Drive. At the time of the visual site inspection, the fire department was under construction as a part of ongoing renovations. Firetrucks that may contain AFFF are parked on the tarmac outside the fire station building. Long Island MacArthur Airport Fire Department staff stated that to their knowledge, an AFFF release has not occurred at the fire department or at the Long Island MacArthur Airport. Although there is no evidence to suggest a PFAS release has occurred at this location, the history of storage and use of AFFF at this location is unknown. Therefore, the Long Island MacArthur Airport Fire Department is considered a potential adjacent off-facility source of PFAS (AECOM 2020). The Long Island MacArthur Airport Fire Department is located up/cross-gradient of the Facility/AOI. It should be noted that the Long Island MacArthur Airport's 2022 Final Site Characterization Report (SCR) does not identify the Fire Department building as an Area of Potential Concern (AOPC) (Arcadis 2022).

3.2.2 Town of Islip Hazardous Materials Response Team

The Town of Islip Hazardous Materials (HAZMAT) Response Team works in tandem with the Long Island MacArthur Airport Fire Department. During the visual site inspection, a pallet of 5-gallon buckets that were labeled as Ansul® products was observed approximately 600 ft south of the fire department in the Town of Islip HAZMAT Response Team parking lot, on the northeast corner of Clark and Schaefer drives. Access to the Town of Islip HAZMAT Response Team parking area was not permitted during the site visit. Although there is no evidence to suggest a PFAS release has occurred at this location, the history of storage and use of AFFF at this location is unknown. Therefore, the Town of Islip HAZMAT Response Team is considered a potential adjacent off-facility source of PFAS (AECOM 2020). The Town of Islip HAZMAT Response Team is located cross-gradient of the Facility. It should be noted that the Long Island MacArthur Airport's 2022 Final SCR does not identify the HAZMAT Response Team building as an AOPC (Arcadis 2022).

3.2.3 Long Island MacArthur Airport Helicopter Crash

The New York Times reported an incident in 1999 of a NYARNG helicopter crashing on the runway at Long Island MacArthur Airport, killing two and severely injuring two others. The crash occurred at the southwest corner of the airport near Runway 6, southwest of the Ronkonkoma AASF #1. Though emergency units responded to the scene, it is unknown if this incident required fire suppression actions involving AFFF. Therefore, the crash area is a

[4] It should be noted that annual NYARNG fire extinguisher training is performed jointly with the fire department at the AASF in a designated area just south of the AOI. However, according to interviews conducted with fire department personnel during the development of the PA, those activities do not use AFFF. Furthermore, only handheld ABC dry chemical extinguishers (not AFFF extinguishers), are known to be equipped on site. Because AFFF is not used in the training, this FTA is not considered a potential release area.

potential adjacent off-facility source of PFAS (AECOM 2020). The helicopter crash area is located cross-gradient of the Facility.

3.2.4 Long Island MacArthur Airport

Since 2019, Arcadis on behalf of the Town of Islip has been conducting records reviews and site characterization to determine if a release of PFAS-containing material occurred at the Long Island MacArthur Airport. A list of 15 AOPCs was developed during their site characterization including locations at the airport which historically used or stored PFAS-containing materials. The Final SCR (Arcadis 2022) documents results of soil, sediment, surface water, stormwater, and groundwater samples collected from 12 of the 15 identified AOPCs. The 3 AOPCs not investigated included the Ronkonkoma AASF #1 (the subject of this SI) and two other facilities (AOPCs 13 [CAMCO] and 14 [Composting Facility]), which had recent investigations under separate programs (Arcadis 2022). Additionally, APOCs 7 [Taxiway Runoff Area #1)] and 12 [Whitney Hangar] are not considered release locations based on the investigation. The remaining AOPCs are identified on **Figure 3-1** with yellow hatching. As reported in the Final SCR, a summary of the AOPCs follows:

- AOPC 01: Recharge Basin #1 – No current or historical use or storage of AFFF was identified in this basin on the southeastern side of the airport complex. The SCR reported that trace detections of PFAS in sediment and stormwater are not indicative of local release: rather, they appear to be related to transport from other areas.

- AOPC 02: Recharge Basin #2 – No current or historical use or storage of AFFF was identified in this basin on the southern side of the airport complex. The SCR reported that trace detections of PFAS in sediment and stormwater were not indicative of local release: rather, they appear to be related to transport from other areas.

- AOPC 03: Fire Training Area #1 – Northeast Wooded Area – Records and field observations indicate historical AFFF use in this fire training area located on the northeastern edge of runway Echo. Highest total PFAS concentration in groundwater at AOPC 03 was 44,638 nanograms per liter (ng/L). Total PFAS concentration along with individual constituents detected were indicative of a local release dominated by PFOS (22,600 ng/L at groundwater sample location GWG 3-1); legacy AFFF usage is suspected based on the compound distribution. PFOA, PFHxS, and PFNA were also detected at GWG 3-1 at concentrations of 1,320, 4,000, and 1,200 ng/L, respectively. The SCR indicated that further investigation was recommended for this area.

- AOPC 04: Fire Training Area #2 – Northwest, Behind Compost Facility – Records and field observations indicate historical and current AFFF use at this fire training area located in the northwestern corner of the airport complex. The highest total PFAS concentration in groundwater at AOPC 04 was 19,754 ng/L. Total PFAS concentration along with individual constituents detected were indicative of a local release. The compound fingerprint indicates use of modern AFFF usage based on the concentrations of 6:2 fluorotelomer sulfonic acid and shorter chained carboxylates but low to not detected concentrations of PFOS, PFOA, PFBS, PFHxS, and PFNA (groundwater at

GWG 4-1 and MW 4-1). The SCR indicated that further investigation was recommended for this area.

- AOPC 05: Equipment Cleanout Area by Suffolk County Water Authority Tower – Records indicate current and ongoing AFFF use at this area located on the western edge of the airport complex. The highest total PFAS concentration in groundwater at AOPC 05 was 1,907 ng/L. Total PFAS concentration along with individual constituents detected were indicative of a local release, likely of a modern AFFF consistent with current fire equipment cleaning activities. PFOS, PFOA, PFBS, PFHxS, and PFNA were detected in groundwater at this AOPC, but at low concentrations compared to other AOPCs. The SCR indicated that further investigation was recommended for this area.

- AOPC 06: Old Fire House – Records and field observations indicate historical AFFF use at the old fire house, located nearby to the east and upgradient of the Ronkonkoma AASF #1. The highest total PFAS concentration in groundwater at AOPC 06 was 67,355 ng/L. Total PFAS concentration along with individual constituents detected were indicative of a local release. Total PFAS concentrations at this AOPC represent the highest detected during the investigation. The compound fingerprint indicates use of legacy AFFF products for training and testing. In groundwater at GWG 6-1 PFOS and PFOA were detected at concentrations of 4,290 and 1,000 ng/L, respectively. PFHxS and PFNA were detected at concentrations of 444 and 143 ng/L, respectively. PFBS was not detected. The SCR indicated that further investigation was recommended for this area.

- AOPC 08: Glycol Treatment Plant – Total PFAS concentration in groundwater at AOPC 08 was 6,139 ng/L. Total PFAS concentrations along with individual constituents detected were indicative of a local release. The PFAS mixtures observed exhibit different geochemical fingerprints than those observed at AOPC 03, 04, 05, 06, and 11. Records review did not identify AFFF related activities in this area. Based on the soil and groundwater data, a source location cannot be determined. The absence of detectable PFOS concentrations in AOPC 08 groundwater is inconsistent with the PFAS mixture observed at AOPC 03 and it is therefore unlikely that AOPC 08 PFAS concentrations reflects transport from AOPC 03. The SCR indicated that further investigation was recommended for this area.

- AOPC 09/AOPC 10: Excelaire/Modern Aviation (formerly known as Sheltair) – Groundwater PFAS constituents were consistent with background, and the SCR reported that concentrations were not indicative of local release.

- AOPC 11: Hertz/Avis/Budget – Records and field observations indicate historical and current use of surfactants and other automotive related substances. Highest total PFAS concentration in groundwater at AOPC 11 was 1,213 ng/L. Total PFAS concentrations along with individual constituents detected were indicative of a local release. The PFAS mixtures observed exhibit different geochemical fingerprints than those observed at AOPC 03, 04, 05, 06, and 08. Records review did not identify AFFF related activities in this area. Based on the soil and groundwater data, a source location could not be determined. In groundwater at GWG 11-2, PFOS and PFOA were detected at

concentrations of 590 and 37.2 ng/L, respectively. PFHxS and PFNA were detected at concentrations of 9.27 and 7.18 ng/L, respectively. PFBS was not detected. The SCR indicated that further investigation was recommended for this area (Arcadis 2022).

The SCR also documented conditions in groundwater upgradient of the airport at well MW-01, thought to be regional background; PFOS, PFOA, PFHxS, PFNA, and PFBS were detected at concentrations of 5.71, 5.91, 4.46, 0.25, and 1.51 ng/L, respectively (Arcadis 2022). These data indicate that the Long Island MacArthur Airport has had multiple releases of PFAS to environmental media over the years of its operation. AOPCs 03, 06, 07, and 12 are situated such that a release in those areas could, under normal groundwater flow conditions, migrate towards the Ronkonkoma AASF #1. Of those, AOPC 03 and 06 had the highest concentrations of PFAS. Groundwater grab sample locations GWG 12-1 and GWG 6-1 are within close proximity to the Ronkonkoma AASF #1 and concentrations will be compared to site conditions in subsequent sections of this report.

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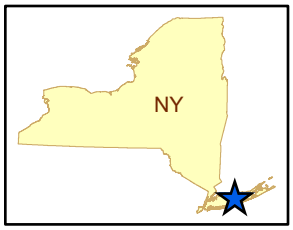
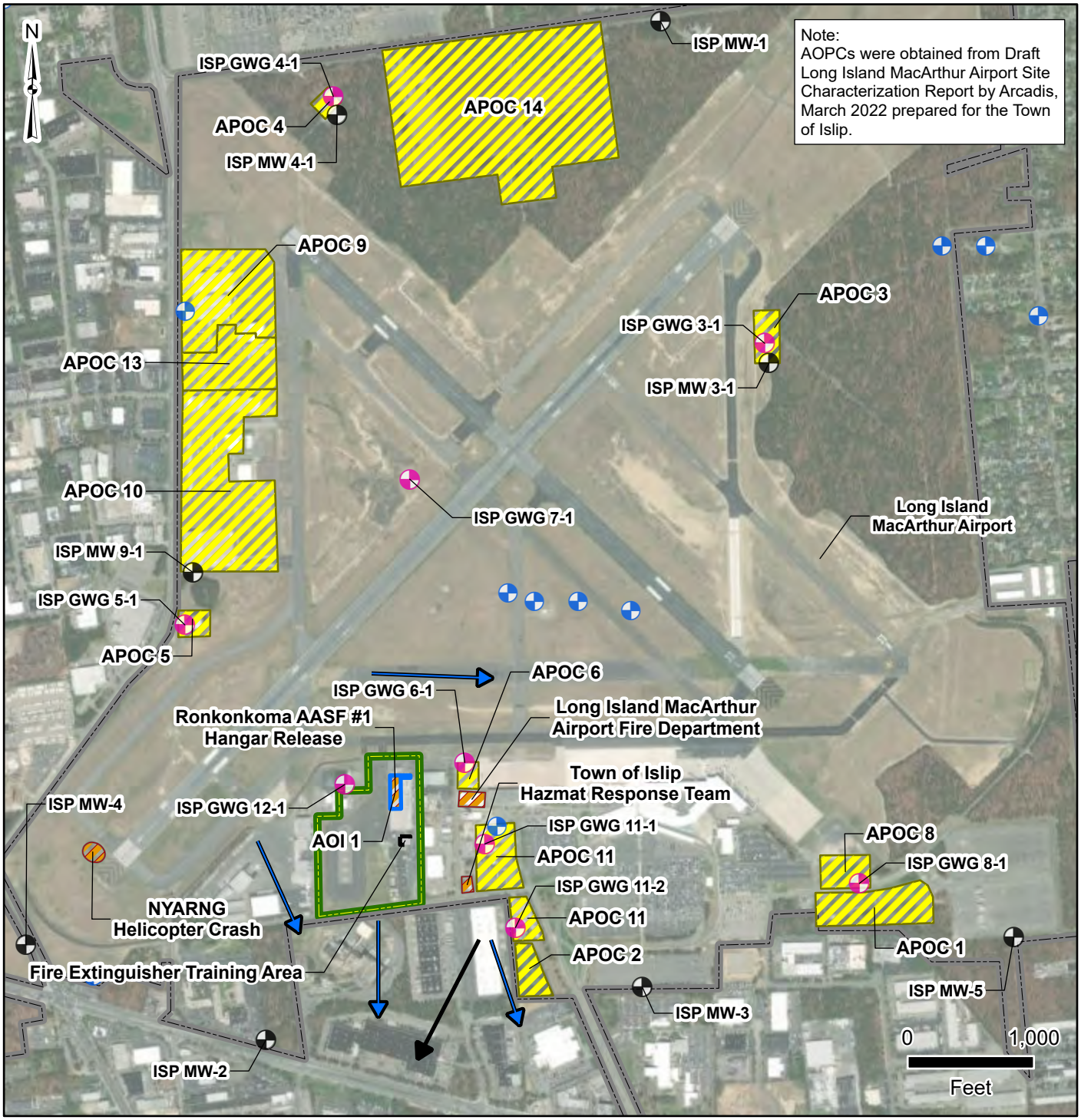
Army National Guard Site Inspections
Site Inspection Report
Ronkonkoma AASF #1, New York

Figure 3-1
Areas of Interest





Facility Data
- Facility Boundary
- Long Island MacArthur Airport
- Area of Interest
- Area of Potential Concern
- Potential PFAS Release
- No Suspected Release

Well Type
- Inactive USGS Monitoring Well
- Airport Groundwater Grab Sample
- Aiport Monitoring Well

Hydrology/Hydrogeology
- Inferred Sheet Flow Direction
- Groundwater Flow Direction

Data Sources:
ESRI 2022
AECOM 2020

Date:.....December 2023
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 18N

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4. PROJECT DATA QUALITY OBJECTIVES

As identified during the data quality objective (DQO) process and outlined in the SI Uniform Federal Policy (UFP) Quality Assurance Project Plan (QAPP) Addendum (EA Engineering, Science, and Technology, Inc., PBC [EA] 2021a), the objective of the SI is to identify whether there has been a release to the environment at the AOI identified in the PA. ARNG determines if further investigation is warranted at the AOI, if 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 AOIs for remedial investigation (RI) if site-related soil and groundwater samples have concentrations of the relevant compounds above the OSD risk-based SLs. The SLs are presented in **Section 6.1** of this report.

4.2 INFORMATION INPUTS

Primary information inputs for the SI include the following:

- The PA Report for the Ronkonkoma AASF #1 (AECOM 2020)
- Long Island MacArthur Airport 2022 Final SCR (Arcadis 2022)
- Groundwater and soil sample data collected as part of this SI in accordance with the site specific UFP–QAPP Addendum (EA 2021a)
- Field data collected including groundwater elevation and water quality parameters measured at the time of sampling.

4.3 STUDY BOUNDARIES

The scope of the SI was bounded horizontally by the property limits of the Facility (**Figure 2-2**). Off-site sampling was not included in the scope of this SI. If future off-site sampling is required, the proper stakeholders will be notified, and necessary rights of entry will be obtained by ARNG with property owner(s). The scope of the SI was vertically bounded as follows: groundwater (maximum 47-52 ft bgs) and soil from direct-push technology (DPT) borings (maximum 47-48 ft bgs).

4.4 ANALYTICAL APPROACH

Samples were analyzed by Eurofins Lancaster Laboratories Environmental, Inc., accredited under the DoD Environmental Laboratory Accreditation Program (ELAP); Accreditation Number (No.) 1.01, and the National Environmental Laboratory Accreditation Program (NELAP); Certificate No. 64082. PFAS data underwent 100% Stage 2B validation in accordance with the DoD General Data Validation Guidelines (2019a) and DoD Data Validation Guidelines Module 3: Data Validation Procedure of Per- and Polyfluoroalkyl Substances Analysis by

Quality Systems Manual (QSM) Table B-15 (2020). PFAS data were compared to applicable SLs within this document and decision rules as defined in the UFP-QAPP Addendum (EA 2021a).

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, 2019b; USEPA 2017).

Based on the DUA, the environmental data collected during the SI were found to be acceptable and usable for this SI evaluation with the qualifications documented in the DUA and its associated data validation reports. These data are of sufficient quality to meet the objectives and requirements of the UFP-QAPP Addendum (EA 2021a).

5. SITE INSPECTION ACTIVITIES

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

- *Final Preliminary Assessment Report, Ronkonkoma Army Aviation Support Facility #1*, dated August 2020 (AECOM 2020)

- *Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan, Site Inspections for Per- and Polyfluoroalkyl Substances Impacted Sites, ARNG Installations, Nationwide*, dated December 2020 (EA 2020a)

- *Final Site Inspection Uniform Federal Policy-Quality Assurance Project Plan Addendum, Ronkonkoma Army Aviation Support Facility #1, New York,* dated October 2021 (EA 2021a)

- *Programmatic Accident Prevention Plan, Revision 1, Site Inspections for Per- and Polyfluoroalkyl Substances Impacted Sites, ARNG Installations, Nationwide*, dated November 2020 (EA 2020b)

- *Final Accident Prevention Plan / Site Safety and Health Plan Addendum, Army Aviation Support Facility #1, Ronkonkoma, New York, Revision 1*, dated October 2021 (EA 2021b).

The SI field activities were conducted from 15 to 19 November 2021 and consisted of DPT boring and soil sample collection, temporary monitoring well installation, and grab groundwater sample collection. Field activities were conducted in accordance with the UFP-QAPP Addendum (EA 2021a), except as noted in **Section 5.9**.

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

- Twenty-seven (27) soil samples from nine locations (soil borings locations)
- Nine (9) grab groundwater samples from nine temporary well locations
- Sixteen (16) various quality assurance (QA)/quality control (QC) samples.

Figure 5-1 provides the sample locations for all media across the Facility. **Table 5-1** presents the list of samples collected for each medium. Field documentation is provided in **Appendix B**. A log of Daily Notice of Field Activity was completed throughout the SI field activities, which is provided in **Appendix B1**. 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 of these activities are presented below.

5.1.1 Technical Project Planning

The U.S. Army of Corps of Engineers (USACE) TPP Process, Engineer Manual (EM) 200-1-2 (Department of the Army 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 AOI identified in the PA.

A combined TPP Meeting 1 and 2 was held on 13 August 2021, prior to SI field activities. The combined TPP Meeting 1 and 2 was conducted in general accordance with EM 200-1-2. The stakeholders for this SI include the ARNG, NYARNG, USACE, NYSDEC, and New York State Department of Health (NYSDOH) representatives familiar with the facility, the regulations, and the community. Stakeholders were provided the opportunity to make comments on the technical sampling approach and methods at the combined TPP Meeting 1 and 2. The outcome of the combined TPP Meeting 1 and 2 was memorialized in the UFP-QAPP Addendum (EA 2021a).

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

5.1.2 Utility Clearance

EA contacted the New York Onecall 811 to notify them of intrusive work at the Facility. EA contracted Xray Locating Service, Inc. of Lindenhurst, New York, a private utility location service, to perform utility clearance at the Facility. Utility clearance was performed at each of the proposed boring locations on 15 November 2021 with input from the EA field team. General locating services, ground-penetrating radar, radio-frequency line locating, and magnetometers were used to complete the clearance. Additionally, the first 5 ft of each boring were pre-cleared by EA's drilling subcontractor, Aquifer Drilling and Testing, A Cascade Company of Mineola, New York, using a hand auger to verify utility clearance in shallow subsurface where utilities would typically be encountered.

5.1.3 Source Water and PFAS Sampling Equipment Acceptability

A sample from a deionization water source at the EA Ecotoxicological Laboratory was collected on 31 March 2021, prior to mobilization, and analyzed for PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15. There were no detections of target compounds.

Materials that were used within the sampling zone were confirmed as acceptable for use in the PFAS sampling environment. The checklist of acceptable materials for use in the PFAS sampling

environment was provided in the Standard Operating Procedures appendix to the Programmatic UFP-QAPP (EA 2020a).

5.2 SOIL BORINGS AND SOIL SAMPLING

Soil boring locations were selected using a variety of factors given known potential migration pathways and to conservatively account for potential unknown pathways or releases. Six boundary locations were selected to assess potential migration entering and leaving the facility. The remaining three locations were placed to the east and south of the AOI to characterize the potential source area. Boring locations to the west and south of the hangar and apron were specifically selected to account for surface drainage directed towards observed stormwater drainage features along the downgradient portions of the facility boundary

Soil samples were collected via DPT drilling methods in accordance with Standard Operating Procedure 047 *Direct-Push Technology Sampling* (EA 2021a). A Geoprobe® 7822DT dual-tube sampling system was used to collect continuous soil cores to the target depth. A hand auger was used to collect soil from the top 5 ft of the boring in compliance with utility clearance procedures. No borings were advanced exclusively by hand auger based on terminal depth.

Three discrete soil samples were collected for chemical analysis from each soil boring: one sample at the surface (0 to 2 ft bgs) and two subsurface soil samples. One subsurface soil sample was collected approximately 1 ft above the groundwater table, and one was collected at the mid-point between the surface and the groundwater table, not to exceed 15 ft bgs. The midpoint soil sample was collected from the 14 to 15 ft bgs interval at each boring. Groundwater was encountered at depths ranging from 44 to 48 ft bgs during drilling. Total boring completion depths, to accommodate temporary well installation, ranged from 48 to 52 ft bgs.

All soil sample locations are shown on **Figure 5-1**, and boring sample depths are provided in **Table 5-1**. The soil boring locations were selected based on the AOI information provided in the PA (AECOM 2020) and as agreed upon by stakeholders during the TPP and review of the UFP-QAPP Addendum (EA 2021a).

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

Each sample was collected into a laboratory-supplied PFAS-free high-density polyethylene (HDPE) bottle and labeled using a PFAS-free marker or pen. Samples were packaged on ice and transported via FedEx under standard chain-of-custody procedures to the laboratory and analyzed for PFAS (LC/MS/MS compliant with QSM Version 5.3 Table B-15), total organic carbon (TOC) (USEPA Method 9060A) and pH (USEPA Method 9045D) in accordance with the UFP-QAPP Addendum (EA 2021a).

Field duplicate samples were collected at a rate of 10% and analyzed for the same parameters as the accompanying samples. Matrix spikes (MS)/matrix spike duplicates (MSDs) were collected at a rate of 5% and analyzed for the same parameters as the accompanying samples. As non-dedicated sampling equipment was used, including a hand auger for the shallow soil samples, equipment blanks (EBs) were collected at a rate of one per day per media 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 after sampling and surveying in accordance with the UFP-QAPP Addendum (EA 2021a). After removal of the casings, boreholes were filled using native soils and bentonite chips. Abandoned locations were capped with sand on the top foot to allow for vegetation regrowth and bentonite expansion. The single boring location installed in asphalt was topped with compacted cold patch.

5.3 TEMPORARY WELL INSTALLATION AND GROUNDWATER GRAB SAMPLING

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

Groundwater samples were collected using a Geotech Environmental Equipment, Inc. PFAS-Free Portable Bladder Pump CE (0.85-inch diameter) with a combined battery-powered compressor/controller using PFAS-free HDPE tubing. Samples were collected after a period of time following well installation to allow groundwater to infiltrate and recharge the temporary well intervals. The pump was dismantled, decontaminated, and the bladder replaced between each sampling location. Each sample was collected in laboratory-supplied PFAS-free HDPE bottles and labeled using a PFAS-free marker or pen. The temporary wells were purged at a rate determined in the field to reduce turbidity and draw down prior to sampling. Water quality parameters (e.g., temperature, specific conductance, pH, dissolved oxygen, and oxidation-reduction potential) were measured using a water quality meter and recorded on the field sampling form (**Appendix B2**) before each grab sample was collected in a separate container. Samples were packaged on ice and transported via FedEx under standard chain of custody procedures to the laboratory and analyzed for PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 in accordance with the UFP-QAPP Addendum (EA 2021a).

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

5.4 SYNOPTIC WATER LEVEL MEASUREMENTS

Groundwater levels were used to monitor site-wide groundwater elevations and assess groundwater flow. Synoptic water level elevation measurements were collected from the newly installed temporary monitoring wells during the survey, prior to well abandonment on 19 November 2021. The measurement reference point was the survey mark on the northern side of the well casing. Groundwater elevation data are provided in **Table 5-3**.

5.5 SURVEYING

The northern side of each new temporary well casing was surveyed using a Trimble R10 real-time kinematic differential global positioning system by EA's subcontractor Scalice Land Surveying P.C. of Islip, New York under supervision of a New York Professional Land Surveyor. Positions were collected in the applicable Universal Transverse Mercator zone projection with World Geodetic System 1984 datum (horizontal) and North American Vertical Datum 1988 (vertical). Surveying data were collected on 19 November 2021 and are provided in **Appendix B3**.

5.6 DUST MONITORING

In accordance with the UFP-QAPP Addendum (EA 2021a), a Community Air Monitoring Plan (CAMP) was instituted during ground disturbing activities at the Facility. The CAMP was performed in general accordance with the New York State Department of Health Generic CAMP, Attachment 1A of the New York State Department of Environmental Conservation Division of Environmental Remediation-10 Technical Guidance for Site Investigation and Remediation. A TSI 8530 Dust Trak II was used to monitor particulate levels continuously downwind of the drill rig when operating. Readings were recorded for reference every 30 minutes during drill rig operation and are included in **Appendix B2**. A background (upwind) ambient reading was also collected at least daily. The highest dust concentration observed was 0.037 milligrams per cubic meter, well below the 100 milligrams per cubic meter threshold in the CAMP for instituting dust suppression techniques. No visible dust was observed during the DPT drilling.

5.7 INVESTIGATION-DERIVED WASTE

As of the date of this report, the disposal of PFAS investigation-derived waste (IDW) is not regulated federally. PFAS IDW generated during the SI is considered non-hazardous waste and was managed in accordance with the UFP-QAPP Addendum (EA 2021a) and with the DA Guidance for Addressing Releases of PFAS, Q18 (DA, 2018).

Soil IDW (i.e., soil cuttings) generated during the SI activities was held in buckets or on polyethylene sheeting at each location until monitoring well abandonment, after which it was placed down the borehole. Liquid IDW (i.e., purge water and decontamination fluids) generated during the SI activities was drummed for later disposal. The liquid IDW drum was labeled and staged inside the southern hangar of the Facility at the direction of NYARNG.

Other solids such as spent personal protective equipment, plastic sheeting, tubing, rope, and unused monitoring well construction materials, and other general waste/trash generated during the field activities were placed in the Facility dumpster with approval of NYARNG to be disposed of at a licensed solid waste landfill.

5.8 LABORATORY ANALYTICAL METHODS

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

Soil samples were also analyzed for TOC using USEPA Method 9060A and pH by USEPA Method 9045D. No samples were analyzed for grain size as detailed in the UFP-QAPP Addendum as the field criteria to collect that sample were not met (clay or other confining layers).

5.9 DEVIATIONS FROM UFP-QAPP ADDENDUM

Deviations from the UFP-QAPP Addendum occurred based on conditions encountered during the field investigation activities. The deviations were discussed between EA, ARNG, USACE, and NYARNG and documented in Field Change Request Form (**Appendix B4**). The one deviation from the UFP-QAPP Addendum is noted below:

- The location of soil boring/temporary monitoring well RONAASF-06 was moved approximately 50 ft north. The original location of RONAASF-06 was on the southern border of the Facility, in a landscaped island near the entrance driveway. The Facility fencing proceeds inwards near the driveway to accommodate the guard shack and, therefore, the drilling location was outside the fence line, but inside the 'Facility boundary.' To facilitate access with the drill rig and security of the monitoring well after installation, the location was moved north, inside the fence line and adjacent to the guard shack. Utility clearance was obtained at the new location. The revised location remains appropriate for downgradient/Facility boundary monitoring.

Table 5-1. Site Inspection Samples by Medium
Ronkonkoma Army Aviation Support Facility #1, New York
Site Inspection Report

Sample Identification	Sample Collection Date	Sample Depth (ft bgs)	PFAS	TOC	pH	Comments
Soil Samples						
AOI01-01-[0-2]	11/16/21	0-2	x			
AOI01-01-[14-15]	11/16/21	14-15	x			
AOI01-01-[47-48]	11/16/21	47-48	x			
RONAASF-FD-SB-01	11/16/21	-	x			Duplicate of AOI01-01-[47-48]
RONAASF-05-[0-2]	11/16/21	0-2	x			
RONAASF-05-[14-15]	11/16/21	14-15	x			
RONAASF-05-[43-44]	11/16/21	43-44	x			MS/MSD
RONAASF-04-[0-2]	11/16/21	0-2	x			
RONAASF-04-[14-15]	11/17/21	14-15	x			
RONAASF-04-[43-44]	11/17/21	43-44	x			
RONAASF-03-[0-2]	11/17/21	0-2	x			
RONAASF-03-[14-15]	11/17/21	14-15	x			
RONAASF-03-[43-44]	11/17/21	43-44	x			
RONAASF-FD-SB-02	11/17/21	–	x			Duplicate of RONAASF-03-[0-2]
RONAASF-06-[0-2]	11/17/21	0-2	x			
RONAASF-06-[14-15]	11/17/21	14-15	x			
RONAASF-06-[43-44]	11/17/21	43-44	x			
RONAASF-01-SB-[0-2]	11/18/21	0-2	x			
RONAASF-01-SB- [14-15]	11/18/21	14-15	x			
RONAASF-01-SB- [43-44]	11/18/21	43-44	x			
RONAASF-02-SB-[0-2]	11/18/21	0-2	x			
RONAASF-02-SB- [14-15]	11/18/21	14-15	x			MS/MSD
RONAASF-02-SB- [39-40]	11/18/21	39-40	x			
RONAASF-FD-SB-03	11/18/21	–	x			Duplicate of RONAASF-02-SB-[0-2]
AOI01-02-SB-[0-2]	11/18/21	0-2	x	x	x	
AOI01-02-SB-[10-15]	11/18/21	10-15	x			
AOI01-02-SB-[43-44]	11/18/21	43-44	x			
AOI01-03-SB-[0-2]	11/19/21	0-2	x			
AOI01-03-SB-[14-15]	11/19/21	14-15	x			
AOI01-03-SB-[43-44]	11/19/21	43-44	x			
Groundwater Samples						
AOI01-01-GW	11/16/21	–	x			
RONAASF-FD-GW-01	11/16/21	–	x			Duplicate of AOI01-01-GW
RONAASF-05-GW	11/17/21	–	x			MS/MSD
RONAASF-04-GW	11/17/21	–	x			
RONAASF-03-GW	11/17/21	–	x			
RONAASF-06-GW	11/18/21	–	x			
RONAASF-01-GW	11/18/21	–	x			
RONAASF-02-GW	11/18/21	–	x			
AOI01-02-GW	11/18/21	–	x			
AOI01-03-GW	11/19/21	–	x			

Sample Identification	Sample Collection Date	Sample Depth (ft bgs)	PFAS	TOC	pH	Comments
Blank Samples						
RONAASF-EB-01	11/16/21	–	x			Equipment blank
RONAASF-FRB-01	11/16/21	–	x			Field blank
RONAASF-EB-02	11/16/21	–	x			Equipment blank
RONAASF-FRB-02	11/17/21	–	x			Field blank
RONAASF-EB-03	11/17/21	–	x			Equipment blank
RONAASF-EB-04	11/17/21	–	x			Equipment blank
RONAASF-EB-05	11/18/21	–	x			Equipment blank
RONAASF-FRB-03	11/18/21	–	x			Field blank
RONAASF-EB-06	11/16/21	–	x			Equipment blank
RONAASF-FRB-04	11/19/21	–	x			Field blank
RONAASF-EB-07	11/19/21	–	x			Equipment blank
RONAASF-EB-08	11/19/21	–	x			Equipment blank

Notes:
No grain size samples were collected as clay or other confining layers were not encountered at the Facility.

Table 5-2. Soil Boring Depths and Temporary Well Screen Intervals
Ronkonkoma Army Aviation Support Facility #1, New York
Site Inspection Report

Area of Interest	Boring ID	Soil Boring Depth (ft bgs)	Temporary Well Screen Interval (ft bgs)
01	AOI01-01	52	47-52
	AOI01-02	48	43-48
	AOI01-03	48	43-48
AASF Boundary	RONAASF-01*	48	43-48
	RONAASF-02	48	43-48
	RONAASF-03	48	43-48
	RONAASF-04	48	43-48
	RONAASF-05	48	43-48
	RONAASF-06	48	43-48

*Located in an area covered by impervious material. It should be noted that concentrations of PFAS in associated soil samples may be less indicative of potential historical releases.

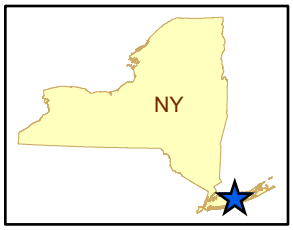
Table 5-3. Groundwater Elevation
Ronkonkoma Army Aviation Support Facility #1, New York
Site Inspection Report

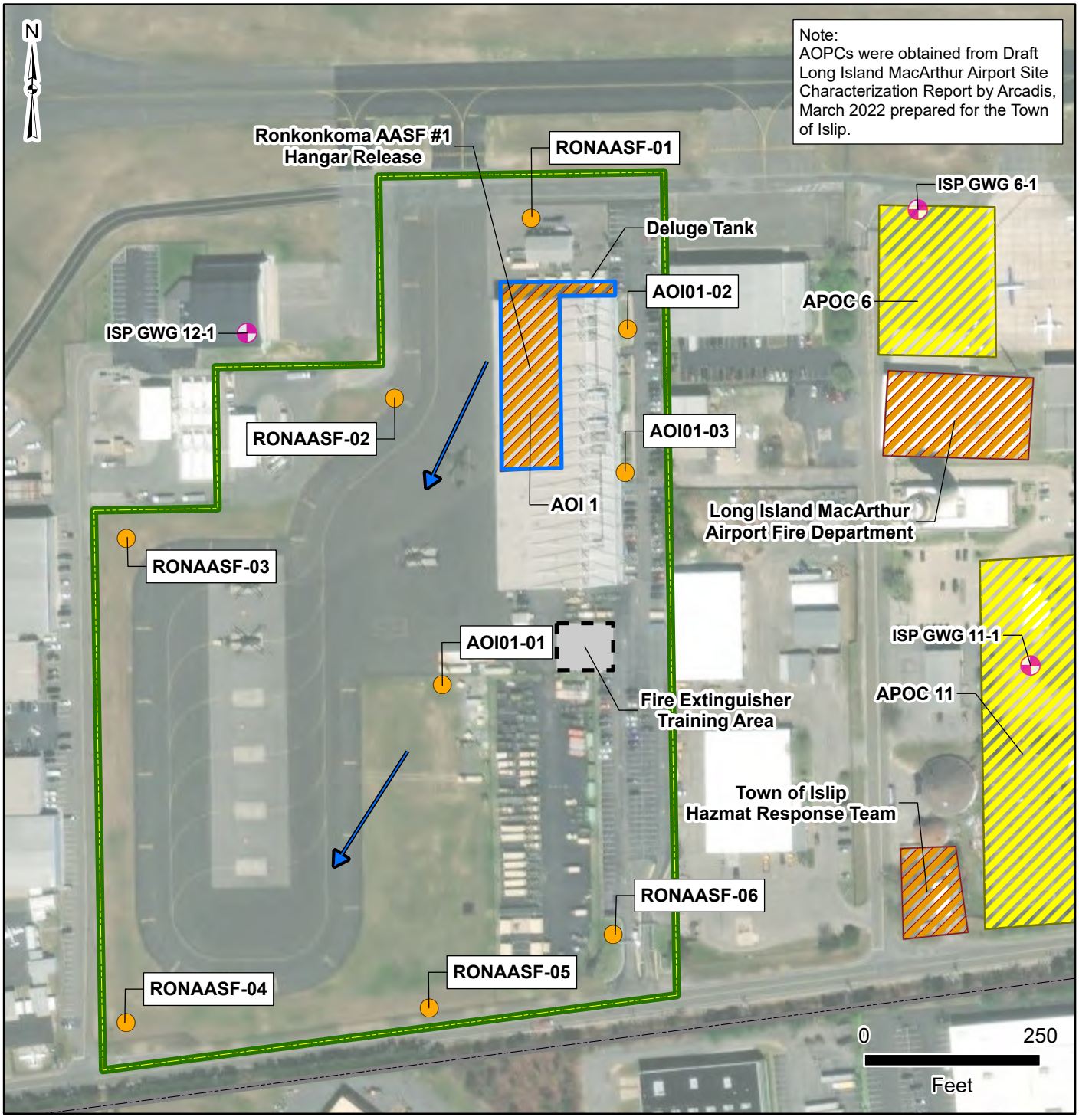
Monitoring Well Identification	Top of Casing Elevation (ft amsl)	Depth to Water (ft btoc)	Groundwater Elevation (ft amsl)
AOI01-01	85.654	46.56	39.094
AOI01-02	83.408	43.59	39.818
AOI01-03	85.067	45.51	39.557
RONAASF-01	85.229	45.27	39.959
RONAASF-02	84.59	45.01	39.58
RONAASF-03	83.61	44.40	39.21
RONAASF-04	82.772	44.47	38.302
RONAASF-05	82.323	43.77	38.553
RONAASF-06	83.955	45.21	38.745

Notes:
amsl = Above mean sea level.
btoc = Below top of casing.

Army National Guard Site Inspections
Site Inspection Report
Ronkonkoma AASF #1, New York

Figure 5-1
Site Inspection Sample Locations





Facility Data
- Facility Boundary
- Long Island MacArthur Airport
- Area of Interest
- Area of Potential Concern
- Potential PFAS Release
- No Suspected Release

Sample Locations
- DPT

Well Type
- Airport Groundwater Grab Sample

Hydrology
- Inferred Sheet Flow Direction

Data Sources:
ESRI 2022
AECOM 2020

Date:.....December 2023
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 18N

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6. SITE INSPECTION RESULTS

This section presents the analytical results of the SI. The SLs used in this evaluation are presented in **Section 6.1**. A discussion of the results for the AOI and boundary areas is provided in **Sections 6.3** and **6.4**. **Table 6-2** through **Table 6-5** present results for 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 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	Residential 0 to 2 ft bgs (Soil) (µg/kg)[1]	Industrial/Commercial Composite Worker 2 to 15 ft bgs (Soil) (µg/kg)[1]	Tap Water (Groundwater) (ng/L)
PFOA	19	250	6
PFOS	13	160	4
PFBS	1,900	25,000	601
PFHxS	130	1,600	39
PFNA	19	250	6

Notes:
1. Assistant Secretary of Defense, 2022. Risk-Based Screening Levels in Groundwater and Soil using EPA's Regional Screening Level Calculator. Hazard Quotient (HQ)=0.1. 6 July 2022.
2. Screening values for HFPO-DA were established after SI planning and execution and thus not included as an analyte. Future CERCLA phases will include HFPO-DA if warranted.

µg/kg = Microgram(s) per kilogram
ng/L = Nanogram(s) per liter

The data in the subsequent sections are compared against the SLs presented in **Table 6-1**. The SLs for groundwater are based on direct ingestion. The SLs for soil are based on incidental ingestion and are applied to the depth intervals reasonably anticipated to be encountered by the receptors identified at the Facility: the residential scenario is applied to surface soil results (0 to 2 ft bgs) and the industrial/commercial worker scenario is applied to shallow subsurface soil results (2 to 15 ft bgs). The SLs are not applied to deep subsurface soil results (greater than 15 ft bgs) because 15 ft 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. No grain size analyses were collected due to no evidence of any confining layers present. **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 of PFAS contaminants. According to the Interstate Technology Regulatory Council (ITRC), several important PFAS partitioning mechanisms

include hydrophobic and lipophobic effects, electrostatic interactions, and interfacial behaviors. At relevant environmental pH values, certain PFAS are present as organic anions, and are therefore relatively mobile in groundwater (Xiao et al. 2015) but tend to associate with the organic carbon fraction that may be present in soil or sediment (Higgins and Luthy 2006; Guelfo and Higgins 2013). When sufficient organic carbon is present, organic carbon normalized distribution coefficients (K_{oc} values) can help in evaluating transport potential, though other geochemical factors (for example, pH and presence of polyvalent cations) may also affect PFAS sorption to solid phases (ITRC 2018).

In the general chemistry analyses, soil pH was noted to be 6.4 and TOC was 23,600 milligrams per kilogram, indicating moderate organic-matter content in the surficial soil sample from AOI 1.

6.3 AOI 1 – RONKONKOMA AASF #1 HANGAR RELEASE AND AFFF STORAGE

This section presents the analytical results for soil and groundwater in comparison to SLs for AOI 1, which includes the Ronkonkoma AASF #1 Hangar Release and AFFF Storage. The detected compounds are summarized in **Tables 6-2** through **6-5**. Soil and groundwater results are presented on **Figures 6-1** through **6-7**.

6.3.1 AOI 1 – Soil Analytical Results

Tables 6-2 through **6-4** summarize the detected compounds in soil. **Figures 6-1** through **6-5** present the ranges of detections in soil.

Soil was sampled in three boring locations associated with potential release areas at AOI 1: AOI01-01 through AOI01-03. Soil was sampled from three intervals at each boring location: surface (0-2 ft bgs), intermediate (between 10 and 15 ft bgs), and deep/water table (between 43-48 ft bgs).

Of the five relevant compounds, three (PFOA, PFOS, and PFNA) were detected at various depths within AOI 1 at concentrations below the SLs. PFOA was detected in three borings at the shallow interval with concentrations ranging from 0.26 J to 0.85 µg/kg, one boring at the intermediate interval with a concentration of 1.30 µg/kg, and one boring at the deep interval at a concentration of 0.66 µg/kg. PFOS was detected in three borings at the shallow interval with concentrations ranging from 0.35 J to 1.60 µg/kg, two borings at the intermediate interval with concentrations ranging from 0.23 J to 0.67 µg/kg, and one boring at the deep interval with a concentration of 0.43 J µg/kg. PFNA was detected in two soil boring at the shallow interval at concentrations of 0.22 J µg/kg and 1.6 µg/kg; one boring at the intermediate interval at 0.31 J µg/kg and one boring at the deep interval at 0.31 J µg/kg. PFBS and PFHxS were not detected in any of the soil borings at any depth interval.

The highest detected concentrations of the three detected compounds all occurred at AOI01-01, though at different depth intervals. The highest concentrations of PFOA occurred at AOI01-01 between 14 and 15 ft bgs. The highest concentration of PFOS and PFNA occurred at AOI01-01 between 0 and 2 ft bgs.

6.3.2 AOI 1 – Groundwater Analytical Results

Figure 6-6 and **6-7** presents the ranges of detections in groundwater. **Table 6-5** summarizes the groundwater results.

Groundwater samples were collected from three temporary wells at AOI 1 during the SI, AOI01-01, AOI01-02, and AOI01-03. Groundwater at each of the three locations had exceedances of the SLs for PFOA, PFOS, and PFNA. PFOA was detected in groundwater at concentrations exceeding the SL of 6 ng/L at each of the three locations; concentrations ranged from 43 to 89 ng/L. PFOS was detected in groundwater at concentrations exceeding the SL of 4 ng/L at each of the three locations; concentrations ranged from 6.8 to 85 ng/L. PFNA was detected in groundwater at concentrations exceeding the SL of 6 ng/L at each of the three locations; concentrations ranged from 10 to 11 ng/L. PFBS and PFHxS were detected at each location, but did not exceed their respective SLs.

6.3.3 AOI 1 – Conclusions

Based on the results of the SI, three relevant compounds (PFOS, PFOA, and PFNA) were detected in one or more soil samples below the applicable SLs. All five relevant compounds (PFOA, PFOS, PFHxS, PFNA, and PFBS) were detected in groundwater at AOI 1. PFOS, PFOA, and PFNA were detected in groundwater at concentrations exceeding the individual SLs in all three temporary well locations associated with AOI 1. The highest concentrations of PFOA, PFOS, and PFNA in groundwater occurred at the same location – AOI01-02 which is situated close to the upgradient property boundary.

6.4 FACILITY BOUNDARY SAMPLE LOCATIONS

This section presents the analytical results for soil and groundwater in comparison to SLs at the six sampling locations along the Facility boundary. The detected compounds are summarized in **Tables 6-2** through **6-5**. Soil and groundwater results are presented on **Figures 6-1** through **6-7.**

6.4.1 Facility Boundary Sample Locations – Soil Analytical Results

Tables 6-2 through **6-4** summarize the detected compounds in soil. **Figures 6-1** through **6-5** present the ranges of detections in soil.

Soil was sampled in the six boring locations at the Facility boundary (RONAASF-01 through RONAASF-06) from three intervals at each boring location: surface (0-2 ft bgs), intermediate (between 10 and 15 bgs), and deep/water table (between 39 and 44 ft bgs).

Of the five relevant compounds, three (PFOA, PFOS, and PFNA) were detected at various depths in the boundary borings at concentrations below the SLs. PFOA was detected in four soil borings at the shallow depth interval with concentrations ranging from 0.22 J to 0.51 J µg/kg, two borings at the intermediate interval with concentrations of 0.20 J to 0.24 J µg/kg, and one boring at the deep interval at a concentration of 0.26 J µg/kg. All PFOA detections were J-flagged estimated concentrations. PFOS was detected in five soil borings at the shallow interval with concentrations ranging from 0.39 J to 1.20 µg/kg, three borings at the intermediate

interval with concentrations ranging from 0.39 J to 3.70 µg/kg, and one boring at the deep interval at a concentration of 0.32 J µg/kg. PFNA was detected in four borings at the shallow interval with concentrations ranging from 0.22 J to 0.84 ng/L. PFNA was not detected in the intermediate and deep intervals. PFBS and PFHxS were not detected in any of the soil borings at any depth interval.

The highest detection of PFOA and PFNA occurred at RONAASF-05 between 0 and 2 ft bgs. The highest detection of PFOS occurred at RONAASF-06 between 14 and 15 ft bgs.

6.4.2 Facility Boundary Sample Locations – Groundwater Analytical Results

Figure 6-6 and **Figure 6-7** present the ranges of detections in groundwater. **Table 6-5** summarizes the groundwater results.

Groundwater samples were collected from six temporary well locations along the Facility's boundary (RONAASF-01 through RONAASF-06). Groundwater at each of the six locations had exceedances of the SLs for at least two of the following compounds: PFOA, PFOA, PFNA, and PFHxS. PFOA was detected in groundwater at concentrations exceeding the SL of 6 ng/L at all six locations with concentrations ranging from 7.6 J- to 130 ng/L. PFOS was also detected in groundwater at a concentration exceeding the SL of 4 ng/L at all six locations with concentrations ranging from 7.8 to 55 ng/L. PFNA was detected in groundwater at a concentration exceeding the SL of 6 ng/L at four locations (RONAASF-01, RONAASF-02, RONAASF-04 and RONAASF-05) at concentrations ranging from 7.8 to 150 ng/L. PFHxS was detected in groundwater at a concentration exceeding the SL of 39 ng/L at only one location (RONAASF-03) at a concentration of 120 ng/L. PFBS was detected in groundwater, but at concentrations below the SL of 601 ng/L.

6.4.3 Facility Boundary Sample Locations – Conclusions

Based on the results of the SI, three relevant compounds (PFOS, PFOA, and PFNA) were detected in one or more soil samples below the applicable SLs. All five relevant compounds (PFOA, PFOS, PFHxS, PFNA, and PFBS) were detected in groundwater at the Facility boundary. PFOS, PFOA, PFNA, and PFHxS were detected in groundwater at one or more Facility boundary locations at concentrations exceeding the individual SLs. The highest concentrations in groundwater were observed at RONAASF-01 and RONAASF-03, both located on the northern/upgradient Facility boundary.

Table 6-2. PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Surface Soil, Site Inspection Report, Ronkonkoma AASF #1

Location ID		AOI01-01		AOI01-02		AOI01-03		RONAASF-01		RONAASF-02		RONAASF-02	
Sample Name		AOI01-01-[0-2]		AOI01-02-SB-[0-2]		AOI01-03-SB-[0-2]		RONAASF-01-SB-[0-2]		RONAASF-02-SB-[0-2]		RONAASF-FD-SB-03	
Parent Sample ID												RONAASF-02-SB-[0-2]	
Sample Date		11/16/2021		11/18/2021		11/19/2021		11/18/2021		11/18/2021		11/18/2021	
Depth (ft bgs)		0-2		0-2		0-2		0-2		0-2		0-2	
Analyte	**Screening Level[1,2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (µg/kg)													
Perfluorobutanesulfonic acid (PFBS)	1900	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorohexanesulfonic acid (PFHxS)	130	ND	U	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorononanoic acid (PFNA)	19	1.6		0.22	J	ND	U	ND	U	0.22	J	ND	U
Perfluorooctanesulfonic acid (PFOS)	13	1.6		0.35	J	0.63	J	0.63	J	1.2		1.2	
Perfluorooctanoic acid (PFOA)	19	0.85		0.26	J	0.38	J	0.22	J	0.24	J	0.23	J

Notes:

1.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.

2. The Screening Levels for soil are based on a residential scenario for incidental ingestion of contaminated soil.

Values exceeding the Screening Level are shaded gray.

µg/kg = Microgram(s) per kilogram.
ft bgs = Feet below ground surface.
J = Estimated concentration.
ND = Analyte not detected above the LOD.
Qual = Qualifier.
U = The analyte was not detected at a level greater than or equal to the adjusted detection limit.

Table 6-2. PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Surface Soil, Site Inspection Report, Ronkonkoma AASF #1

	Location ID	RONAASF-03		RONAASF-03		RONAASF-04		RONAASF-05		RONAASF-06	
	Sample Name	RONAASF-03-[0-2]		RONAASF-FD-SB-02		RONAASF-04-[0-2]		RONAASF-05-[0-2]		RONAASF-06-[0-2]	
	Parent Sample ID			RONAASF-03-[0-2]							
	Sample Date	11/17/2021		11/17/2021		11/16/2021		11/16/2021		11/17/2021	
	Depth (ft bgs)	0-2		0-2		0-2		0-2		0-2	
Analyte	**Screening Level[1,2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (µg/kg											
Perfluorobutanesulfonic acid (PFBS)	1900	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorohexanesulfonic acid (PFHxS)	130	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorononanoic acid (PFNA)	19	ND	U	0.31	J	0.31	J	0.84		ND	U
Perfluorooctanesulfonic acid (PFOS)	13	0.41	J	0.36	J	0.39	J	0.53	J	0.54	J
Perfluorooctanoic acid (PFOA)	19	ND	U	ND	U	0.3	J	0.51	J	ND	U

Notes:

1.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.

2. The Screening Levels for soil are based on a residential scenario for incidental ingestion of contaminated soil.

Values exceeding the Screening Level are shaded gray.

µg/kg = Microgram(s) per kilogram.
ft bgs = Feet below ground surface.
J = Estimated concentration.
ND = Analyte not detected above the LOD.
Qual = Qualifier.
U = The analyte was not detected at a level greater than or equal to the adjusted detection limit.

Table 6-3. PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Shallow Subsurface Soil, Site Inspection Report, Ronkonkoma AASF #1

	Location ID	AOI01-01		AOI01-02		AOI01-03		RONAASF-01		RONAASF-02	
	Sample Name	AOI01-01-[14-15]		AOI01-02-SB-[10-15]		AOI01-03-SB-[14-15]		RONAASF-01-SB-[14-15]		RONAASF-02-SB-[14-15]	
	Parent Sample ID										
	Sample Date	11/16/2021		11/18/2021		11/19/2021		11/18/2021		11/18/2021	
	Depth (ft bgs)	14-15		10-15		14-15		14-15		14-15	
Analyte	**Screening Level[1,2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (µg/kg)											
Perfluorobutanesulfonic acid (PFBS)	25000	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorohexanesulfonic acid (PFHxS)	1600	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorononanoic acid (PFNA)	250	0.31	J	ND	U	ND	U	ND	U	ND	U
Perfluorooctanesulfonic acid (PFOS)	160	0.67		0.23	J	ND	U	ND	U	ND	U
Perfluorooctanoic acid (PFOA)	250	1.3		ND	U	ND	U	0.24	J	ND	U

Notes:

1.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.

2. The Screening Levels for soil are based on incidental ingestion of soil in a industrial/commercial worker scenario.

Values exceeding the Screening Level are shaded gray.
µg/kg = Microgram(s) per kilogram.
ft bgs = Feet below ground surface.
J = Estimated concentration.
ND = Analyte not detected above the LOD.
Qual = Qualifier.
U = The analyte was not detected at a level greater than or equal to the adjusted detection limit.

Table 6-3. PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Shallow Subsurface Soil, Site Inspection Report, Ronkonkoma AASF #1

	Location ID	RONAASF-03		RONAASF-04		RONAASF-05		RONAASF-06	
	Sample Name	RONAASF-03-[14-15]		RONAASF-04-[14-15]		RONAASF-05-[14-15]		RONAASF-06-[14-15]	
	Parent Sample ID								
	Sample Date	11/17/2021		11/17/2021		11/16/2021		11/17/2021	
	Depth (ft bgs)	14-15		14-15		14-15		14-15	
Analyte	**Screening Level[1,2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (µg/kg)									
Perfluorobutanesulfonic acid (PFBS)	25000	ND	U	ND	U	ND	U	ND	U
Perfluorohexanesulfonic acid (PFHxS)	1600	ND	U	ND	U	ND	U	ND	U
Perfluorononanoic acid (PFNA)	250	ND	U	ND	U	ND	U	ND	U
Perfluorooctanesulfonic acid (PFOS)	160	0.39	J	ND	U	0.43	J	3.7	
Perfluorooctanoic acid (PFOA)	250	ND	U	ND	U	ND	U	0.2	J

Notes:

1.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.

2. The Screening Levels for soil are based on incidental ingestion of soil in a industrial/commercial worker scenario.

Values exceeding the Screening Level are shaded gray.
µg/kg = Microgram(s) per kilogram.
ft bgs = Feet below ground surface.
J = Estimated concentration.
ND = Analyte not detected above the LOD.
Qual = Qualifier.
U = The analyte was not detected at a level greater than or equal to the adjusted detection limit.

Table 6-4. PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Deep Subsurface Soil, Site Inspection Report, Ronkonkoma AASF #1

Location ID	AOI01-01		AOI01-01		AOI01-02		AOI01-03		RONAASF-01	
Sample Name	AOI01-01-[47-48]		RonAASF-FD-SB-01		AOI01-02-SB-[43-44]		AOI01-03-SB-[43-44]		RONAASF-01-SB-[43-44]	
Parent Sample ID			AOI01-01-[47-48]							
Sample Date	11/16/2021		11/16/2021		11/18/2021		11/19/2021		11/18/2021	
Depth (ft bgs)	47-48		47-48		43-44		43-44		43-44	
Analyte	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (µg/kg)										
Perfluorobutanesulfonic acid (PFBS)	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorohexanesulfonic acid (PFHxS)	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorononanoic acid (PFNA)	0.31	J	ND	U	ND	U	ND	U	ND	U
Perfluorooctanesulfonic acid (PFOS)	0.43	J	ND	U	ND	U	ND	U	ND	U
Perfluorooctanoic acid (PFOA)	0.66		0.3	J	ND	U	ND	U	0.26	J

Notes:
1. No Screening Levels were applied due to sample depths.
µg/kg = Microgram(s) per kilogram.
ft bgs = Feet below ground surface.
J = Estimated concentration.
ND = Analyte not detected above the LOD.
Qual = Qualifier.
U = The analyte was not detected at a level greater than or equal to the adjusted detection limit.

Table 6-4. PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Deep Subsurface Soil, Site Inspection Report, Ronkonkoma AASF #1

Location ID	RONAASF-02		RONAASF-03		RONAASF-04		RONAASF-05		RONAASF-06	
Sample Name	RONAASF-02-SB-[39-40]		RONAASF-03-[43-44]		RONAASF-04-[43-44]		RONAASF-05-[43-44]		RONAASF-06-SB-43-44	
Parent Sample ID										
Sample Date	11/18/2021		11/17/2021		11/17/2021		11/16/2021		11/17/2021	
Depth (ft bgs)	39-40		43-44		43-44		43-44		43-44	
Analyte	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (µg/kg)										
Perfluorobutanesulfonic acid (PFBS)	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorohexanesulfonic acid (PFHxS)	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorononanoic acid (PFNA)	ND	U	ND	U	ND	U	ND	U	ND	U
Perfluorooctanesulfonic acid (PFOS)	ND	U	0.32	J	ND	U	ND	U	ND	U
Perfluorooctanoic acid (PFOA)	ND	U	ND	U	ND	U	ND	U	ND	U

Notes:
1. No Screening Levels were applied due to sample depths.
µg/kg = Microgram(s) per kilogram.
ft bgs = Feet below ground surface.
J = Estimated concentration.
ND = Analyte not detected above the LOD.
Qual = Qualifier.
U = The analyte was not detected at a level greater than or equal to the adjusted detection limit.

Table 6-5. PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Groundwater, Site Inspection Report, Ronkonkoma AASF #1

	Location ID	AOI01-01		AOI01-01		AOI01-02		AOI01-03		RONAASF-01	
	Sample Name	AOI01-01-GW		RonAASF-FD-GW-01		AOI-01-02-GW		AOI01-03-GW		RONAASF-01-GW	
	Parent Sample ID			AOI01-01-GW							
	Sample Date	11/16/2021		11/16/2021		11/18/2021		11/19/2021		11/18/2021	
Analyte	**Screening Level[1]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (ng/L)											
Perfluorobutanesulfonic acid (PFBS)	601	1.7		1.6	J	1.6	J	4.9		1.2	J
Perfluorohexanesulfonic acid (PFHxS)	39	12		12		16		16		2.9	
Perfluorononanoic acid (PFNA)	6	11		11		11		10		150	
Perfluorooctanesulfonic acid (PFOS)	4	6.8		6.9		85		26		31	
Perfluorooctanoic acid (PFOA)	6	76		76		89		43		130	

Notes:

1.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.

Values exceeding the Screening Level are shaded gray.

J = Estimated concentration.

J- = Estimated concentration, biased low.

ND = Analyte not detected above the LOD.

ng/L = Nanogram(s) per liter.

Qual = Qualifier.

Table 6-5. PFOA, PFOS, PFBS, PFNA, and PFHxS Results in Groundwater, Site Inspection Report, Ronkonkoma AASF #1

	Location ID	RONAASF-02		RONAASF-03		RONAASF-04		RONAASF-05		RONAASF-06	
	Sample Name	RONAASF-02-GW		RONAASF-03-GW		RONAASF-04-GW		RONAASF-05-GW		RONAASF-06-GW	
	Parent Sample ID										
	Sample Date	11/18/2021		11/17/2021		11/17/2021		11/17/2021		11/18/2021	
Analyte	**Screening Level[1]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS by LC/MS/MS compliant with QSM Version 5.3 Table B-15 (ng/L)											
Perfluorobutanesulfonic acid (PFBS)	601	1	J	4.8		1	J	1.1	J	1.2	J-
Perfluorohexanesulfonic acid (PFHxS)	39	20		120		7		11		5.7	J-
Perfluorononanoic acid (PFNA)	6	7.8		1.2	J	21		16		3.4	
Perfluorooctanesulfonic acid (PFOS)	4	7.8		55		8.7		21		9.8	J-
Perfluorooctanoic acid (PFOA)	6	35		16		16		50		7.6	J-

Notes:

1.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.

Values exceeding the Screening Level are shaded gray.

J = Estimated concentration.

J- = Estimated concentration, biased low.

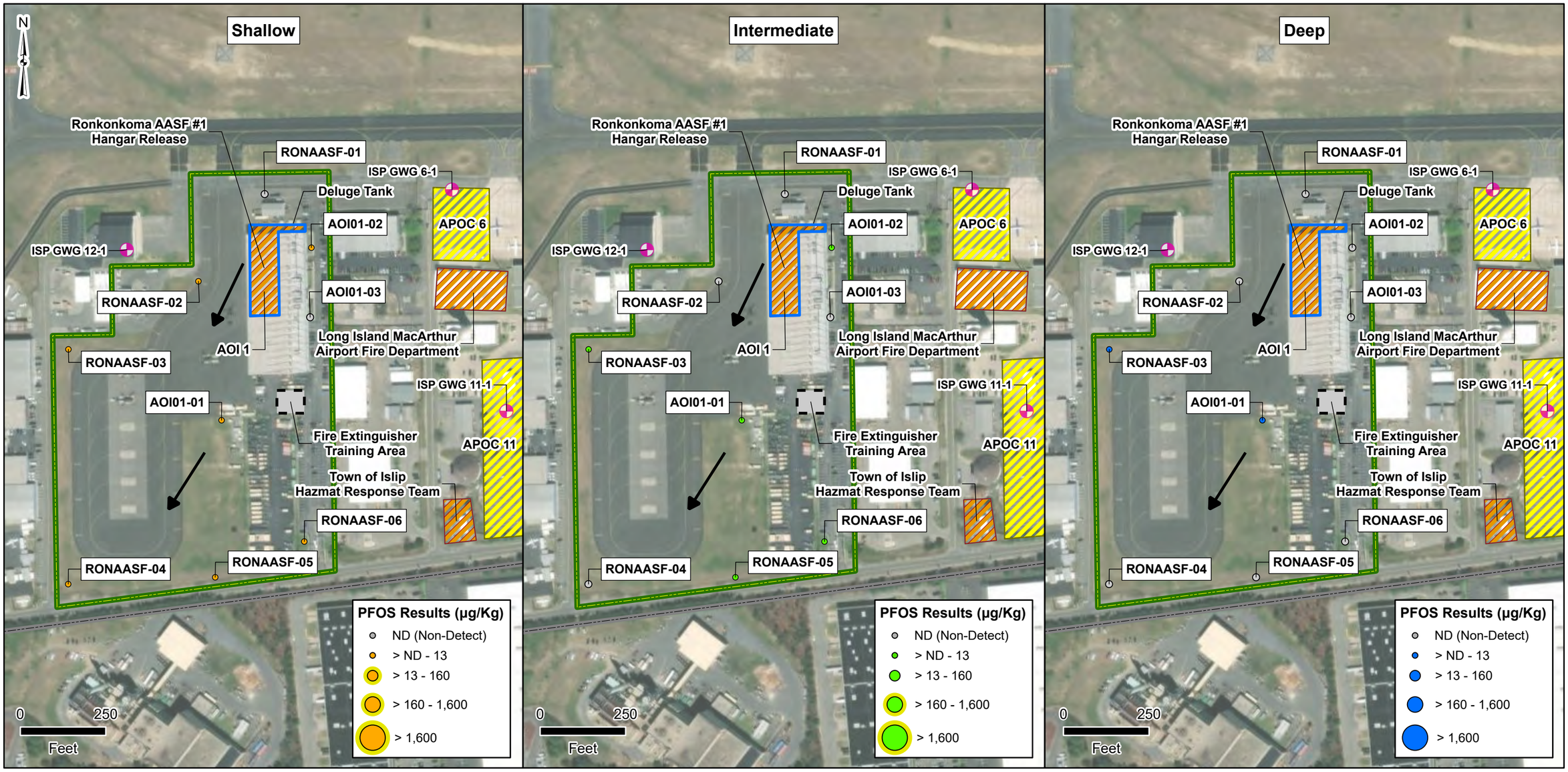
ND = Analyte not detected above the LOD.

ng/L = Nanogram(s) per liter.

Qual = Qualifier.

Army National Guard Site Inspections
Site Inspection Report
Ronkonkoma AASF #1, New York

Figure 6-1
AOI 1
PFOS Detections in Soil



Facility Data
- Facility Boundary
- Long Island MacArthur Airport
- Area of Interest
- Area of Potential Concern
- Potential PFAS Release
- No Suspected Release

Well Type
- Airport Groundwater Grab Sample

Hydrogeology
- Groundwater Flow Direction

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

AOPCs were obtained from Draft Long Island MacArthur Airport Site Characterization Report by Arcadis, March 2022 prepared for the Town of Islip.

Data Sources:
ESRI 2022
AECOM 2019

Date:.....December 2023
Prepared By:.....EA
Prepared For:.....USACE
Projection:.....WGS 84 UTM 18N

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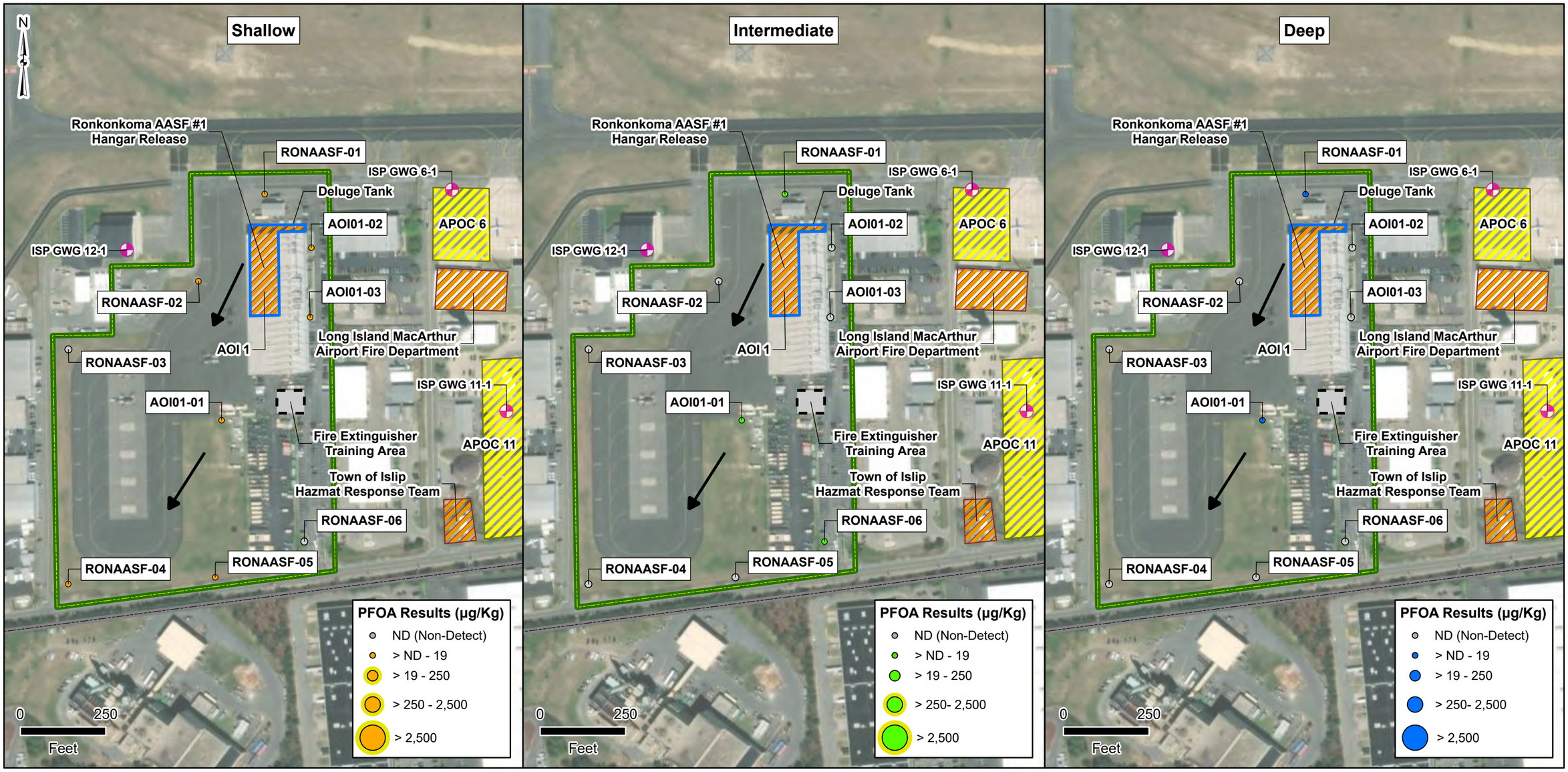
Site Inspection Report
Ronkonkoma AASF #1, New York

Figure 6-2
AOI 1
PFOA Detections in Soil



Facility Data
- Facility Boundary
- Long Island MacArthur Airport
- Area of Interest
- Area of Potential Concern
- Potential PFAS Release
- No Suspected Release

Well Type
- Airport Groundwater Grab Sample

Hydrogeology
- Groundwater Flow Direction

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

AOPCs were obtained from Draft Long Island MacArthur Airport Site Characterization Report by Arcadis, March 2022 prepared for the Town of Islip.

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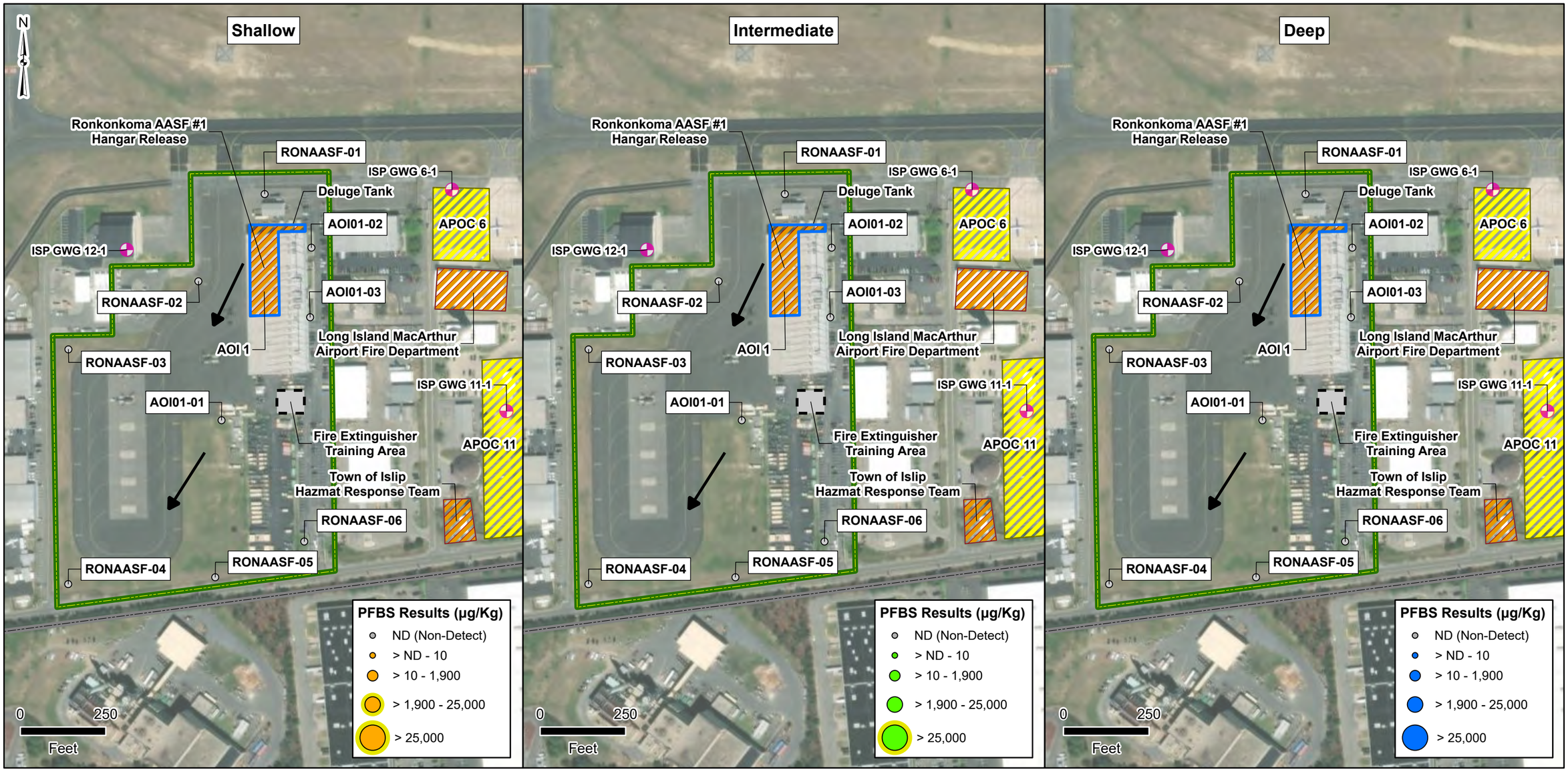
Site Inspection Report
Ronkonkoma AASF #1, New York

Figure 6-3
AOI 1
PFBS Detections in Soil



Facility Data
- Facility Boundary
- Long Island MacArthur Airport
- Area of Interest
- Area of Potential Concern
- Potential PFAS Release
- No Suspected Release

Well Type
- Airport Groundwater Grab Sample

Hydrogeology
- Groundwater Flow Direction

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

AOPCs were obtained from Draft Long Island MacArthur Airport Site Characterization Report by Arcadis, March 2022 prepared for the Town of Islip.

Data Sources:
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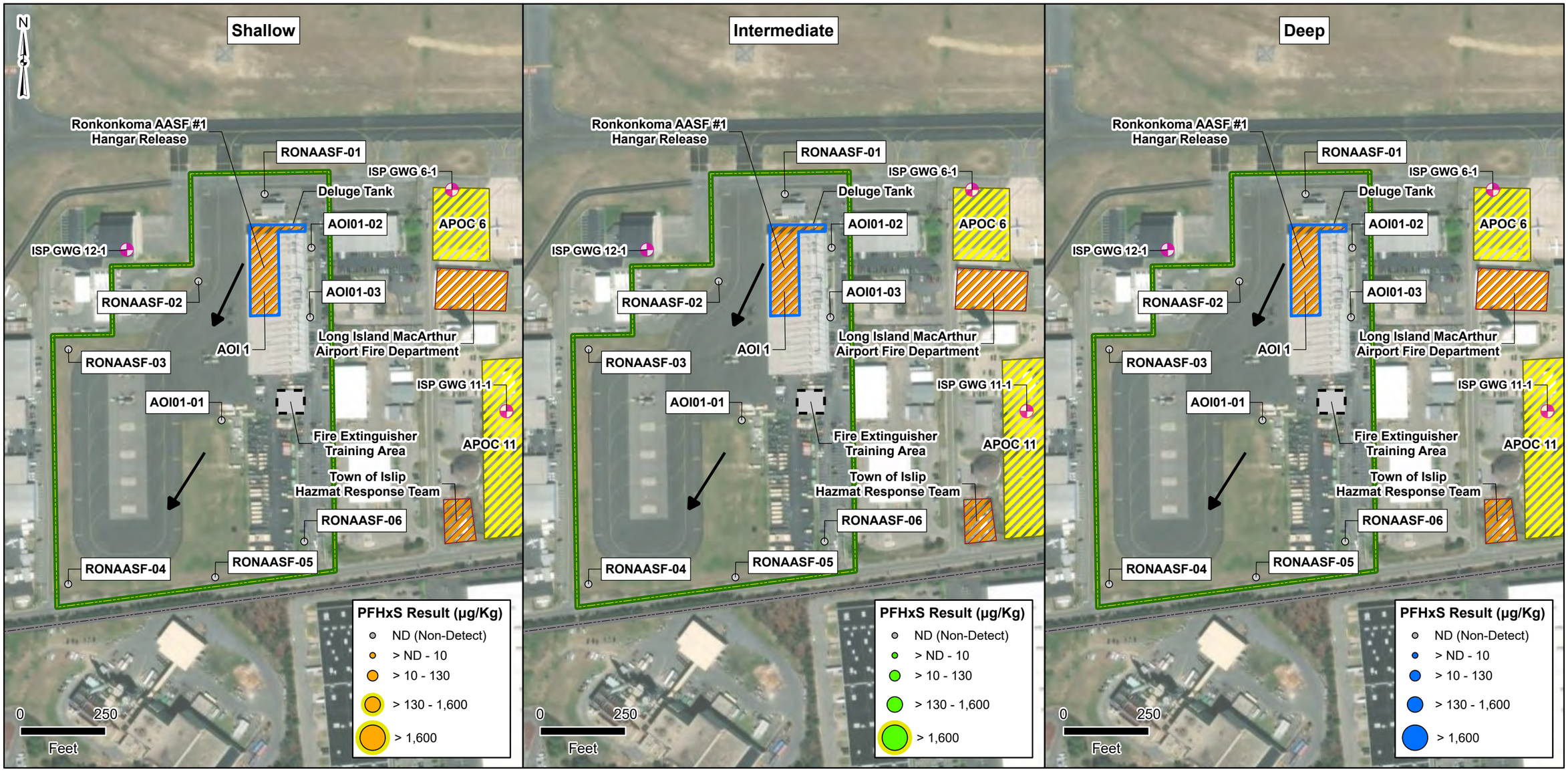
Ronkonkoma AASF #1, New York

Figure 6-4
AOI 1
PFHxS Detections in Soil



Facility Data
- Facility Boundary
- Long Island MacArthur Airport
- Area of Interest
- Area of Potential Concern
- Potential PFAS Release
- No Suspected Release

Well Type
- Airport Groundwater Grab Sample

Hydrogeology
- Groundwater Flow Direction

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

AOPCs were obtained from Draft Long Island MacArthur Airport Site Characterization Report by Arcadis, March 2022 prepared for the Town of Islip.

Data Sources:
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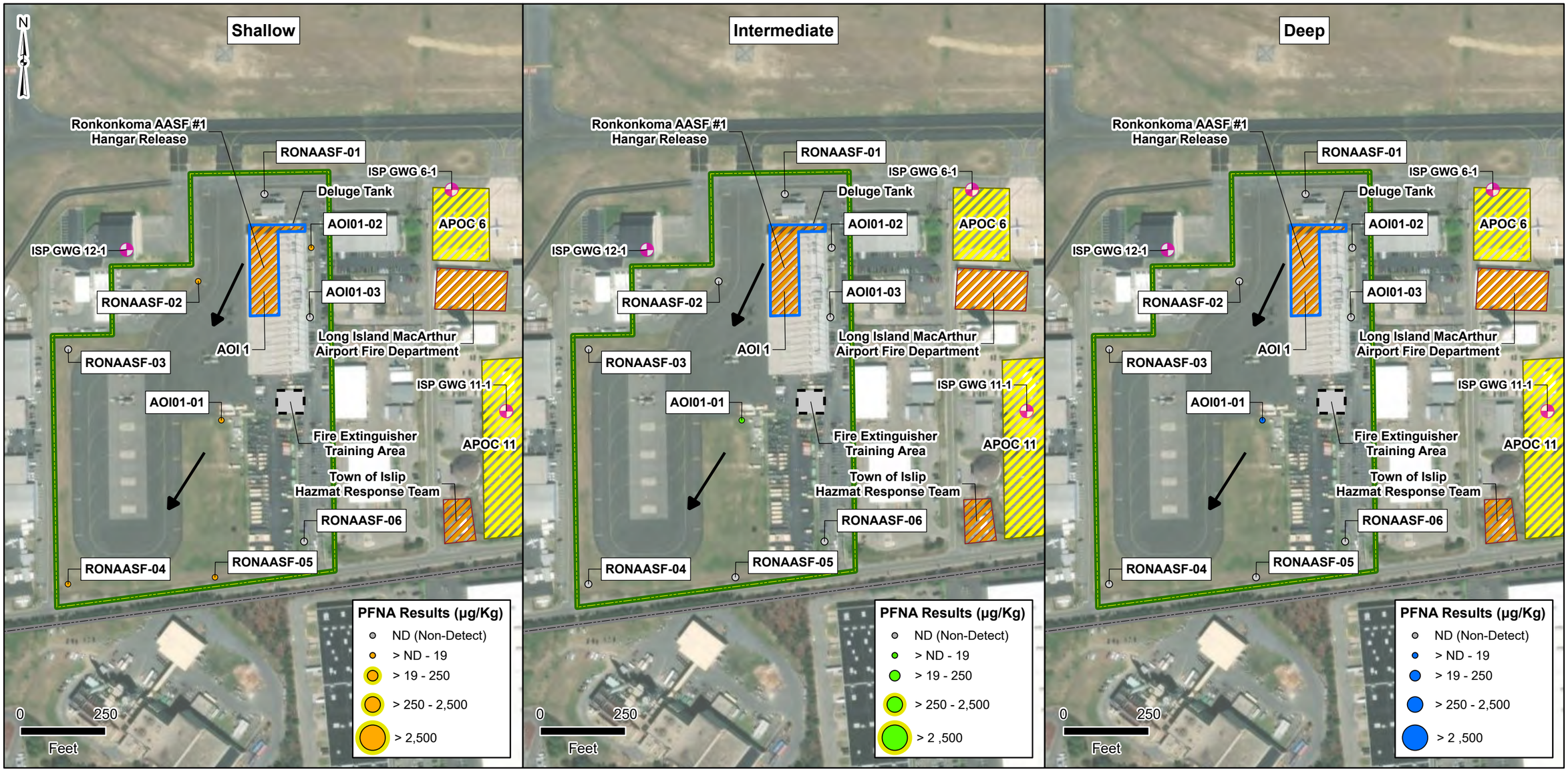
Site Inspection Report
Ronkonkoma AASF #1, New York

Figure 6-5
AOI 1
PFNA Detections in Soil



Facility Data
- Facility Boundary
- Long Island MacArthur Airport
- Area of Interest
- Area of Potential Concern
- Potential PFAS Release
- No Suspected Release

Well Type
- Airport Groundwater Grab Sample

Hydrogeology
- Groundwater Flow Direction

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

AOPCs were obtained from Draft Long Island MacArthur Airport Site Characterization Report by Arcadis, March 2022 prepared for the Town of Islip.

Data Sources:
ESRI 2022
AECOM 2019

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Prepared By:.....EA
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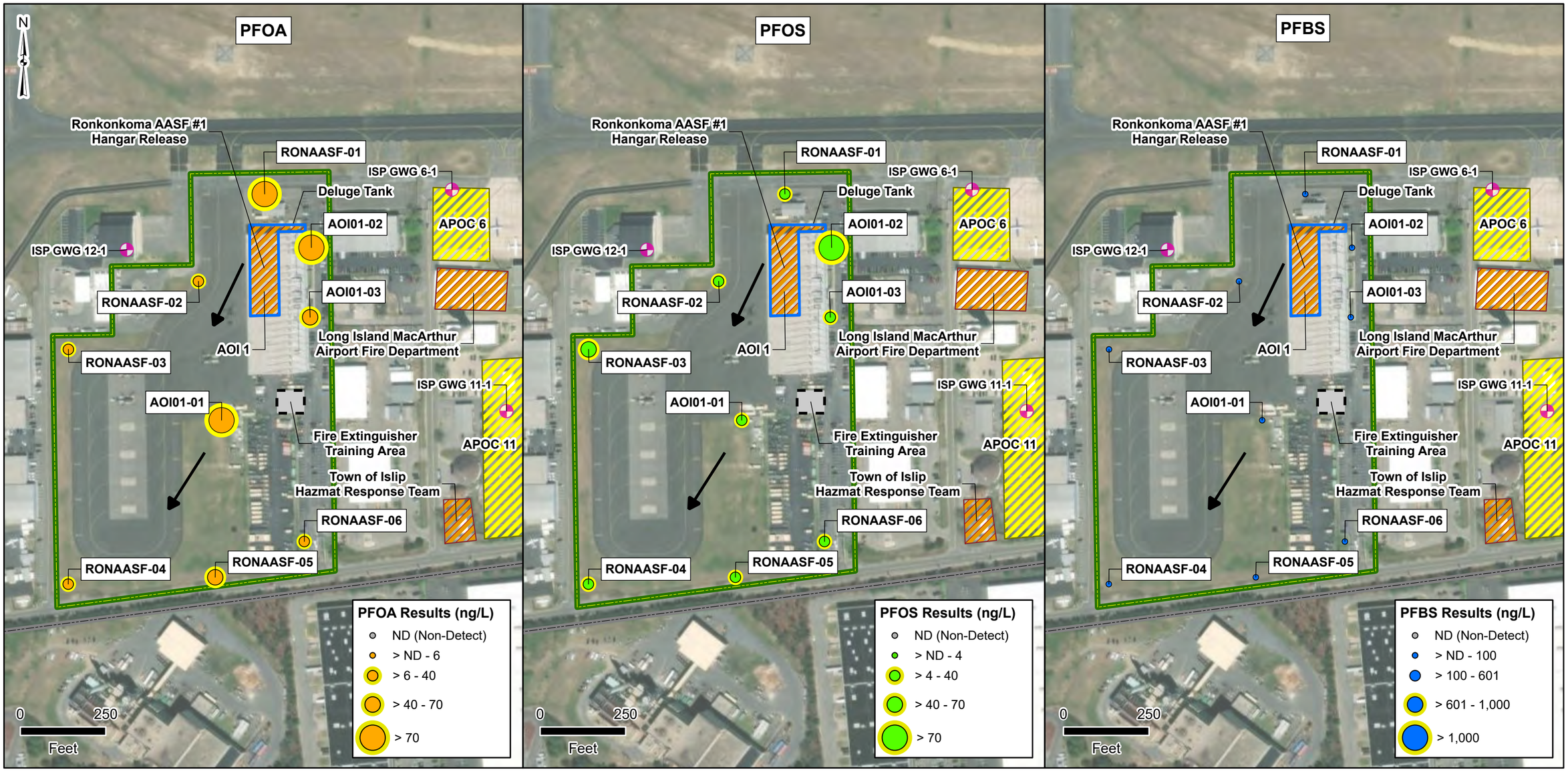
Site Inspection Report
Ronkonkoma AASF #1, New York

Figure 6-6
AOI 1
PFOA, PFOS and PFBS Detections in Groundwater



Facility Data
- Facility Boundary
- Long Island MacArthur Airport
- Area of Interest
- Area of Potential Concern
- Potential PFAS Release
- No Suspected Release

Well Type
- Airport Groundwater Grab Sample

Hydrogeology
- Groundwater Flow Direction

Notes:
PFOA = Perfluorooctanesulfonic acid
PFOS = Perfluorooctanoic acid
PFBS = Perfluorobutanesulfonic acid
Exceedances of the OSD SL are depicted with a yellow halo.

AOPCs were obtained from Draft Long Island MacArthur Airport Site Characterization Report by Arcadis, March 2022 prepared for the Town of Islip.

Data Sources:
ESRI 2022
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Date:.....December 2023
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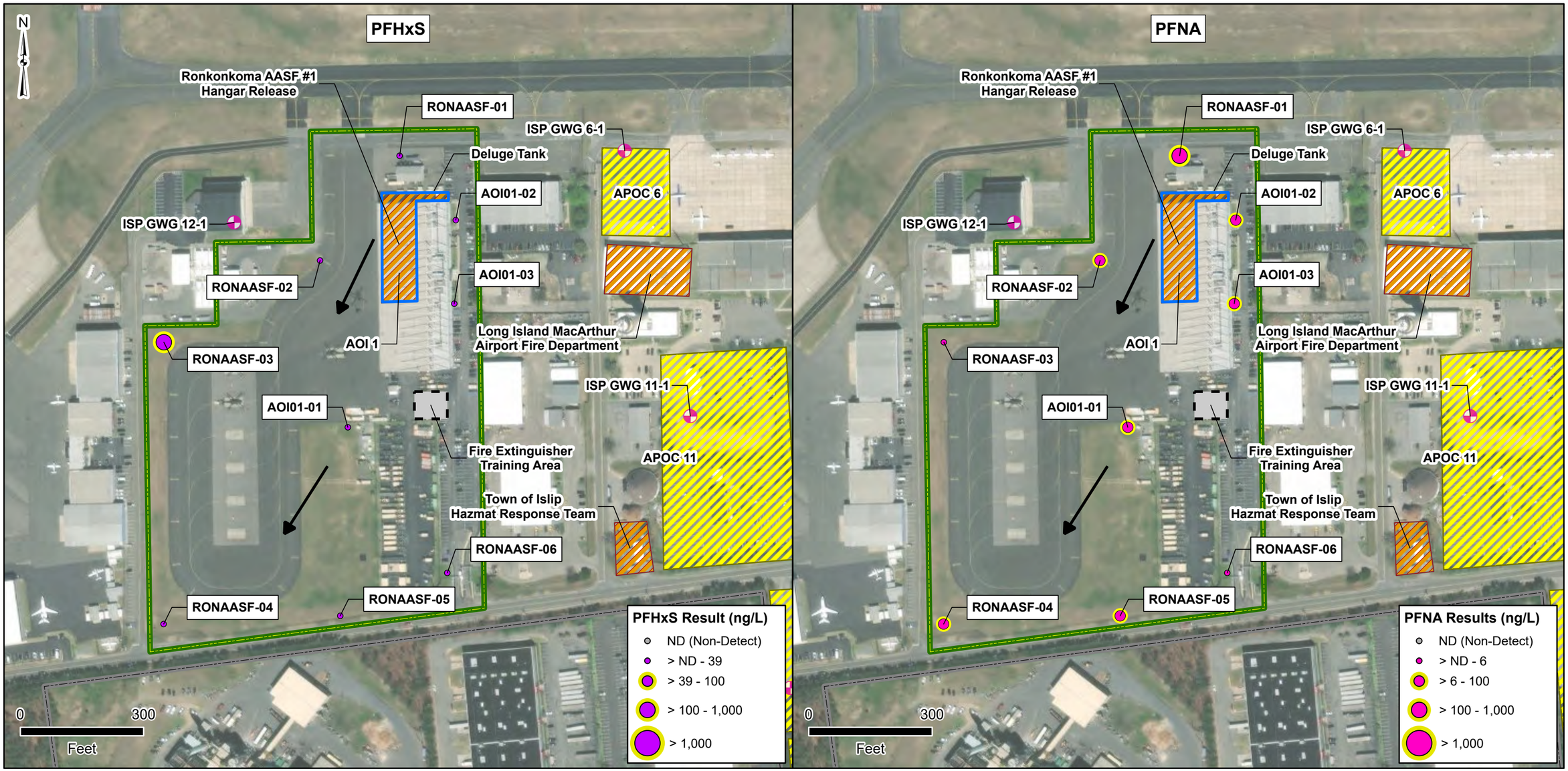
Site Inspection Report
Ronkonkoma AASF #1, New York

Figure 6-7
PFHxS and PFNA Detections in Groundwater



Facility Data
- Facility Boundary
- Long Island MacArthur Airport
- Area of Interest
- Area of Potential Concern
- Potential PFAS Release
- No Suspected Release

Well Type
- Airport Groundwater Grab Sample

Hydrogeology
- Groundwater Flow Direction

Notes:
PFHxS = Perfluorohexanesulfonic acid
PFNA = Perfluorononanoic acid
Exceedances of the OSD SL are depicted with a yellow halo.

AOPCs were obtained from Draft Long Island MacArthur Airport Site Characterization Report by Arcadis, March 2022 prepared for the Town of Islip.

Data Sources:
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AECOM 2019

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Prepared By:.....EA
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7. EXPOSURE PATHWAYS

The conceptual site model (CSM) for the AOI, revised based on the SI findings, is presented on Figure 7-1. Please note that while the CSM discussion assists in determining if a receptor may be impacted, the decision to move from SI to RI or interim action is determined solely 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. SLs are presented in Section 6.1 of this report. 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
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 no identified complete pathway generally warrant no further action. However, the pathway is considered potentially complete if the relevant compounds are detected, in which case the CSM figure uses a half-filled circle symbol to represent a potentially complete exposure pathway. Additionally, a completely filled circle symbol is used to indicate when a potentially complete exposure pathway has detections of 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 Facility workers (e.g., Facility staff and visiting soldiers), construction workers, trespassers, residents outside the Facility boundary, and recreational users outside of the Facility boundary. The CSM for AOI 1, revised based on the SI findings, is presented on **Figure 7-1**.

7.1 SOIL EXPOSURE PATHWAY

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

7.1.1 AOI 1 – Ronkonkoma AASF #1 Hangar Release and AFFF Storage

The presence of AFFF within the Ronkonkoma AASF #1 Hangar constitutes AOI 1 based on the possibility of a spill, leakage, or release. There has been one known instance of deluge system testing inside the hangar in which all HEF and residuals were reportedly captured and disposed of off-site. The potential release mechanism for PFAS would have been undocumented spills or leaks during filling of the two AFFF manual floor units.

AOI 1 is primarily paved with asphalt and/or thick concrete except for small, landscaped areas surrounding the AASF building (east of the hangars). The DPT borings were situated in landscaped areas.

PFOA, PFOS and PFNA were detected in surface soil at AOI 1 at concentrations below the SLs. Site workers and construction workers could contact constituents in surface soil via incidental ingestion and inhalation of dust. Therefore, the surface soil exposure pathway for site workers and construction workers are potentially complete. Additionally, PFOA, PFOS, and PFNA were detected in subsurface soil at concentrations below the SLs. Ground-disturbing activities to subsurface soil could result in construction worker exposure to detected constituents via incidental ingestion. Therefore, the exposure pathway for subsurface soil is potentially complete for the construction worker. The CSM for these AOIs is presented in **Figure 7-1**.

7.2 GROUNDWATER EXPOSURE PATHWAY

The SI results for 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 – Ronkonkoma AASF #1 Hangar Release and AFFF Storage

All of the five relevant compounds were detected in groundwater from the three temporary wells in AOI 1. In addition, PFOA, PFOS, and PFNA exceeded their SLs in one or more locations. The potential AOI 1 release could have reached groundwater through infiltration in the ground, with or without the help of precipitation and concentrated leaching structures (infiltrating catch basins). The CSM considers the exposure to both subsurface soils impacted by leaching and groundwater. Ingestion of groundwater by construction workers during construction was evaluated, but the pathway is considered incomplete because the depth to water is approximately 42 to 45 ft bgs, much deeper than normal trenching or construction activities.

Groundwater exceeding the SL for PFOA, PFOA, and PFNA is present at the downgradient property boundary (RONAASF-04 and -05). In addition, PFAS was confirmed to be in the downgradient water systems (both public and private wells) at concentrations exceeding the USEPA Health Advisory[5]. It is further noted that concentrations of PFAS compounds entering the Facility from upgradient off-Facility sources are higher than those migrating off the downgradient side of the property. Based upon the fluctuation in concentration across the Facility as reported in this SI and the findings pertaining to offsite upgradient sources (MacArthur Airport SCR discussed in **Section 3.2**), an on-site source is not indicated by the

[5] At the time of the study, the Health Advisory level was 70 ppt for PFOS and PFOA, individually or combined.

current data. However, the pathway is considered complete for off-Facility residents given the reported concentrations in groundwater leaving the Facility and the detections in the downgradient drinking water wells. The CSM is presented in **Figure 7-1**.

7.3 SURFACE WATER AND SEDIMENT EXPOSURE PATHWAY

PFAS are water soluble and can migrate readily from soil to surface water or groundwater. There are no natural surface water features within the facility therefore the surface water/sediment pathway is incomplete. **Figure 7-1.**

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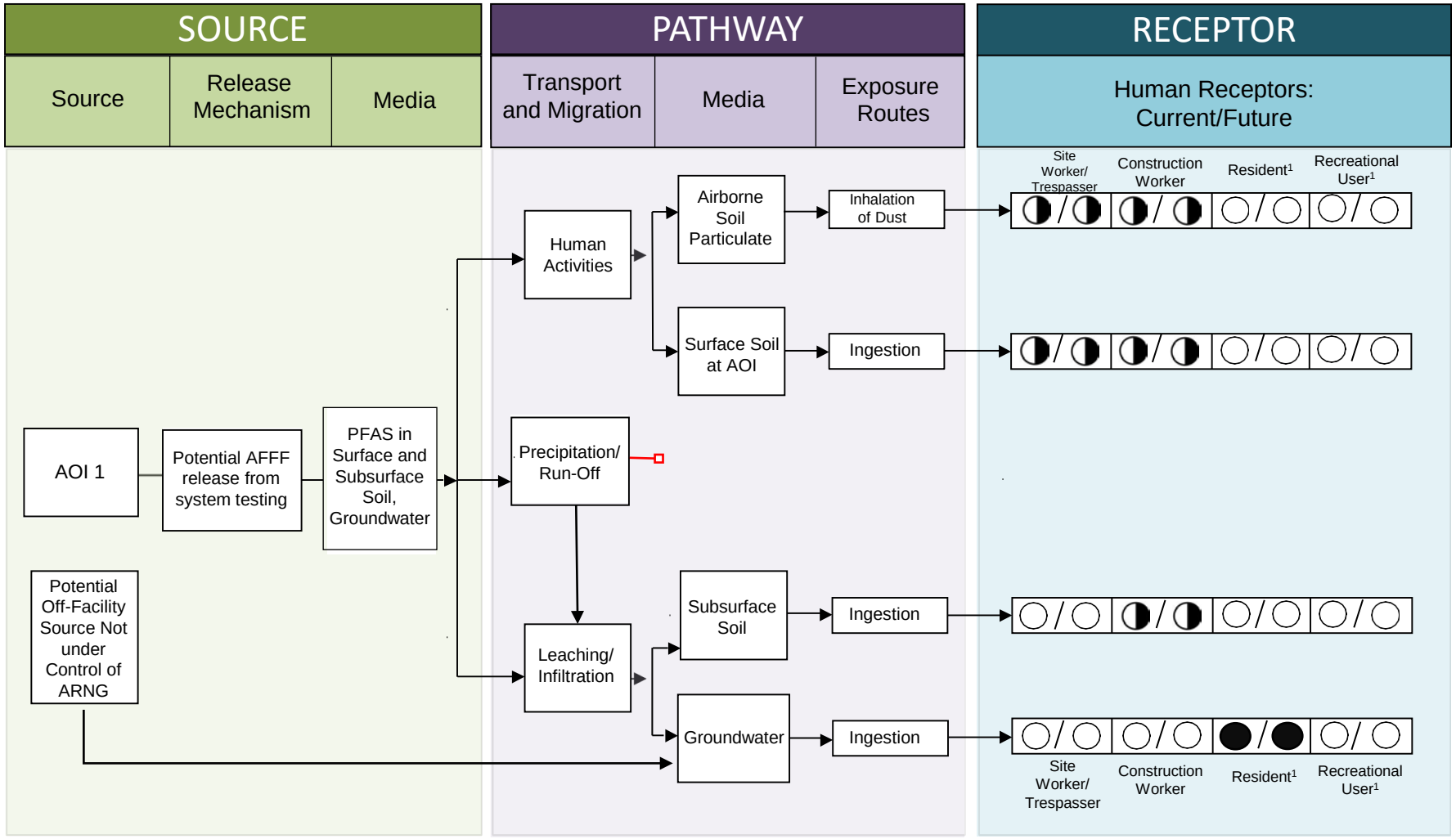

LEGEND

- Flow-Chart Stops
- Flow-Chart Continues
- Partial / Possible Flow
- Incomplete Pathway
- Potentially Complete Pathway
- Potentially Complete Pathway with Exceedance of Screening Level

Notes:

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

Figure 7-1
Conceptual Site Model
AOI 1 Ronkonkoma AASF #1

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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 SITE INSPECTION ACTIVITIES SUMMARY

The SI field activities at the Facility were conducted from 15 to 19 November 2021. The SI field activities included soil and groundwater sampling. Field activities were conducted in accordance with the UFP-QAPP Addendum (EA 2021a), except as previously noted in **Section 5.9**.

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

- Twenty-seven (27) soil samples from nine locations (soil borings locations)
- Nine (9) grab groundwater samples from nine temporary well locations
- Sixteen (16) 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 an AOI to determine whether or not a release has occurred. The SI may conclude further investigation is warranted, a removal action is required to address immediate threats, or no further action is required. Additionally, the CSM was refined to assess whether a potentially complete pathway exists between the source and potential receptors for potential exposure at the AOI, which is described in **Section 7**.

8.2 OUTCOME

Based on the results of this SI, no further action by ARNG is warranted for AOI 1. This determination is made in consideration of all site history collected to date, the samples collected during this SI, and with consideration of data collected from known non-DoD adjacent releases. Sampling locations used as part of this investigation were biased towards areas considered highly likely to be associated with an onsite release. Stormwater drainage pathways and areas closest to potential release areas were targeted. All detections of OSD regulated compounds are well below associated SLs in soil collected from all intervals. There appears to be no correlation between the exceedances of PFNA, PFOS, PFHxS, and PFOA in groundwater and local releases. The highest concentrations of PFAS in groundwater observed on-site were found in the most upgradient samples collected at the facility. Concentrations were observed to consistently decrease with distance across the site, additional source area contributions were not observed in soil data nor in groundwater trends. Based on the CSM developed and revised based on the SI findings, there is potential for exposure to site/construction workers during surface and subsurface soil-disturbing activities. Additionally, there is potential for exposure to residential drinking water receptors, though the groundwater impacts are likely from off-Facility sources, not historical or current DoD activities at the Facility. Sample analytical concentrations collected during this SI were

compared against the project SLs for the relevant compounds in soil and groundwater, as described in **Table 6-1**. The following bullets summarize the SI results and findings:

- AOI 1:

  — All of the five relevant compounds (PFOS, PFOA, PFBS, PFNA, and PFHxS) were detected in groundwater in the source areas near the Facility boundary at AOI 1. PFOS, PFOA, and PFNA exceeded the SL in groundwater in all three AOI 1 temporary wells with a maximum concentration of 85, 89, and 11 ng/L, respectively. PFBS and PFHxS concentrations did not exceed the SLs. It should be noted that concentrations of PFAS compounds entering the Facility from upgradient off-Facility sources are higher than those migrating off the downgradient side of the property. Based upon the fluctuation in concentration across the Facility as reported in this SI and the findings pertaining to offsite upgradient sources (MacArthur Airport SCR discussed in Section 3.2), an on-site source is not indicated by the current data. Additionally, it should be noted that HEF, not AFFF was used/stored in the facility's deluge system. No conclusive information regarding the presence of fluorinated compounds in HEF is known; it is unlikely to result in concentrations of the relevant compounds that exceed their respective criteria based on the information available at the time of reporting including ARNG sampling at facilities where solely Jet-X HEF has been released. However, the pathway is considered complete for off-Facility residents given the reported concentrations in groundwater leaving the Facility and the detections in the downgradient drinking water wells. Based on the results of the SI (specifically higher concentrations in upgradient boundary wells and the discovery that the Facility used/stored HEF instead of the AFFF in the primary fire suppression system) and considering the Airport SCR, further evaluation of AOI 1 is not warranted.

  — PFOA, PFOS, and PFNA were detected in soil at AOI 1 at concentrations below the SLs. There were no detections of PFBS and PFHxS in soil.

- The Facility Boundary:

  — Groundwater at each of the six Facility boundary locations (RONAASF-01 through RONAASF-06) had exceedances of the SLs for at least two of the following compounds: PFOA, PFOS, PFNA, and PFHxS. PFBS was also detected in each groundwater sample but at concentrations below the SLs. The highest concentrations in groundwater were observed at RONAASF-01 and RONAASF-03, both located on the northern/upgradient Facility boundaries. This suggests potential contributions from off-Facility sources, including those documented sources in the Airport SCR. The Long Island MacArthur Airport SCR documents releases from six AOPCs, two of which are upgradient of the Facility (AOPCs 03 and 06). AOPC 06 and its groundwater sample location GWG 6-1, located east of the northern portion of the Facility, exhibited concentrations of PFOS and PFOA of 4,290 and 1,000 ng/L, respectively. Those off-site, up/cross-gradient concentrations demonstrate a plume with substantial concentrations of relevant compounds is present within the Airport

complex within the vicinity of the Facility and is entering the Ronkonkoma AASF #1 on its northeastern side.

— PFOA, PFOS and PFNA were detected 1 to 2 orders of magnitude lower than the soil SLs in samples from the six Facility boundary locations. There were no detections of PFBS and PFHxS in soil.

- Given current evidence that is supported by the SI findings, there is no indication of a DoD related release of PFAS at Ronkonkoma AASF #1. No further action by ARNG is warranted at this time.

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 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 8-1 summarizes the SI results for soil and groundwater used to determine if an AOI should be considered for further investigation under CERCLA and undergo an RI.

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

AOI	Potential Release Area	Soil Source Area	Groundwater Source Area	Groundwater Facility Boundary	Future Action
1	Ronkonkoma AASF #1 Hangar Release and AFFF Storage	◐	●	●	No further action by ARNG

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

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