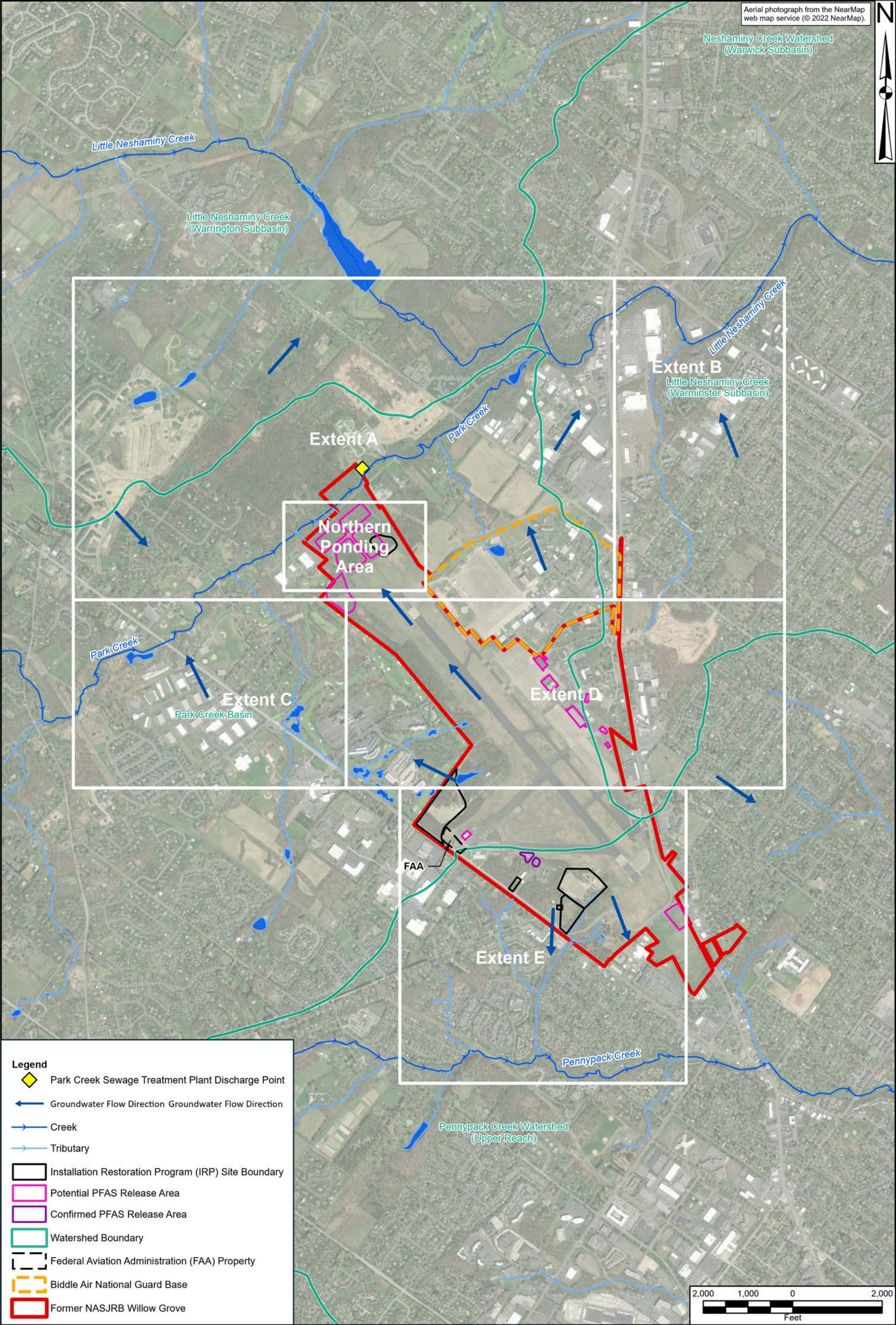




SURFACE WATER AND SEDIMENT SAMPLING AREAS
EXTENT LOCATION MAP
FORMER NASJRB WILLOW GROVE
HORSHAM TOWNSHIP, PENNSYLVANIA



Naval Facilities Engineering Systems Command

DRAWN BY MK BOND	DATE 03/15/24	CTO WE04
CHECKED BY T MOORE	DATE 03/15/24	FIGURE NUMBER 1

Surface Water	
	PFOS
Human Health PSL (ng/L) ^{2,3}	140
Ecological PSL - Aquatic Organism (ng/L) ^{4,5,6}	22,600
Ecological PSL - Wildlife (ng/L) ^{4,5,6}	2,080

PFAS SURFACE WATER SAMPLING ANALYTICAL RESULTS
PFOS HUMAN HEALTH EXCEEDANCES ONLY
(SEPTEMBER 2021 - JUNE 2022)
EXTENT A
FORMER NASJRB WILLOW GROVE
HORSHAM TOWNSHIP, PENNSYLVANIA



DRAWN BY MK BOND	DATE 03/15/24	CTO WE04
CHECKED BY T MOORE	DATE 03/15/24	FIGURE NUMBER 2

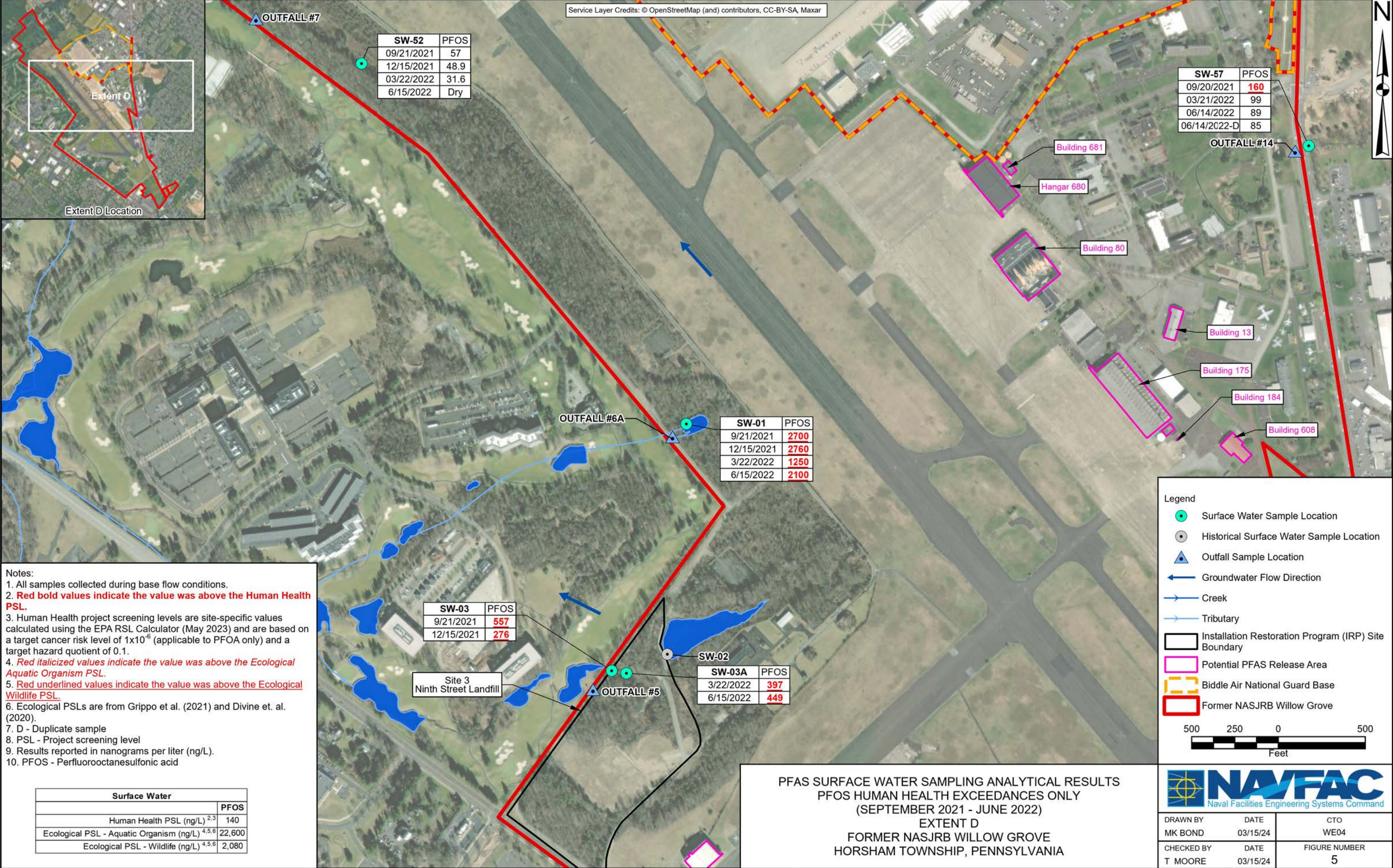


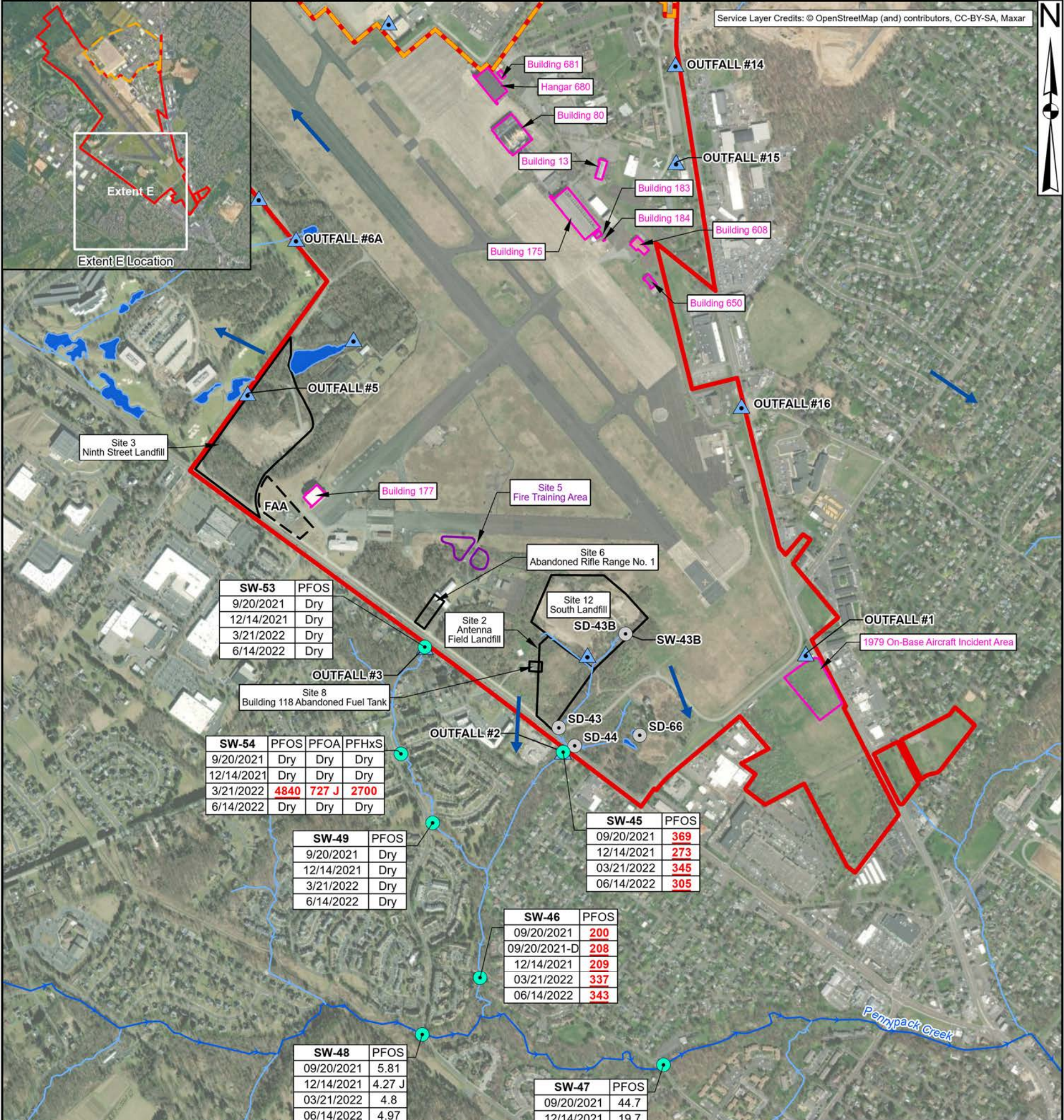
PFAS SURFACE WATER SAMPLING ANALYTICAL RESULTS
PFOS HUMAN HEALTH EXCEEDANCES ONLY
(SEPTEMBER 2021 - JUNE 2022)
EXTENT B
FORMER NASJRB WILLOW GROVE
HORSHAM TOWNSHIP, PENNSYLVANIA



DRAWN BY	DATE	CTO
MK BOND	03/15/24	WE04
CHECKED BY	DATE	FIGURE NUMBER
T MOORE	03/15/24	3







Notes:

1. All samples collected during base flow conditions.
2. **Red bold values indicate the value was above the Human Health PSL.**
3. Human Health project screening levels are site-specific values calculated using the EPA RSL Calculator (May 2023) and are based on a target cancer risk level of 1×10^{-6} (applicable to PFOA only) and a target hazard quotient of 0.1.
4. **Red italicized values indicate the value was above the Ecological Aquatic Organism PSL.**
5. **Red underlined values indicate the value was above the Ecological Wildlife PSL.**
6. Ecological PSLs are from Grippo et al. (2021) and Divine et. al. (2020).
7. D - Duplicate sample
8. PSL - Project screening level
9. Results reported in nanograms per liter (ng/L).
10. PFOS - Perfluorooctanesulfonic acid
11. PFOA - Pentadecafluorooctanoic Acid
12. PFHXS - Perfluorohexanesulfonic Acid

Surface Water			
	PFOS	PFOA	PFHxS
Human Health PSLs (ng/L) ^{2,3}	140	210	1200
Ecological (Aquatic Organism) PSLs (ng/L) ^{4,5,6}	22600	307000	65300
Ecological (Aquatic Wildlife) PSLs (ng/L) ^{4,5,6}	117	1600000	5500

PFAS SURFACE WATER SAMPLING ANALYTICAL RESULTS
PFOS HUMAN HEALTH EXCEEDANCES ONLY
(SEPTEMBER 2021 - JUNE 2022)
EXTENT E
FORMER NASJRB WILLOW GROVE
HORSHAM TOWNSHIP, PENNSYLVANIA

Legend

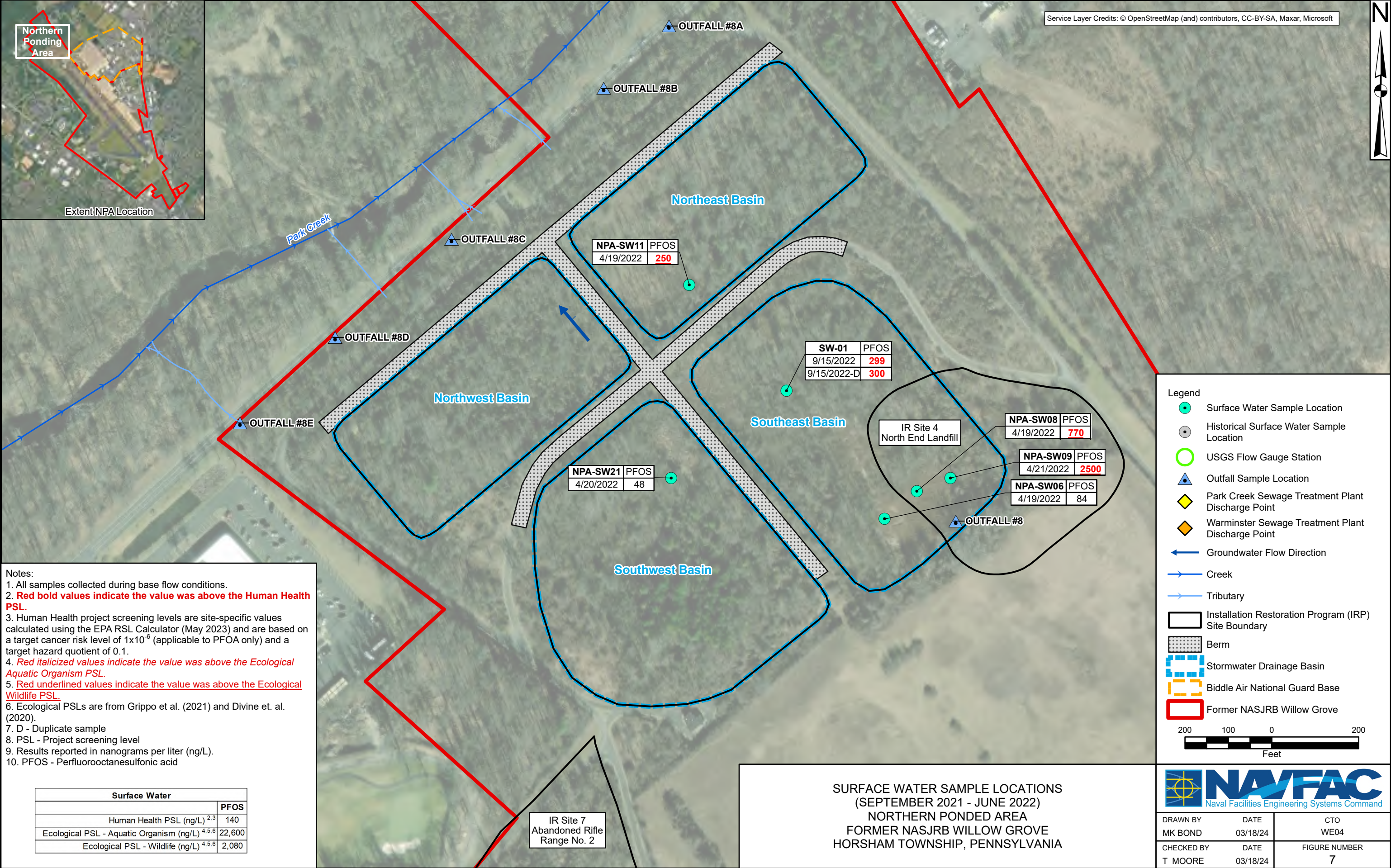
- Sediment Sample Location
- Historical Sediment Sample Location
- Outfall Sample Location
- Park Creek Sewage Treatment Plant Discharge Point
- Groundwater Flow Direction
- Creek
- Tributary
- Installation Restoration Program (IRP) Site Boundary
- Potential PFAS Release Area
- Confirmed PFAS Release Area
- Federal Aviation Administration (FAA) Property
- Biddle Air National Guard Base
- Former NASJRB Willow Grove

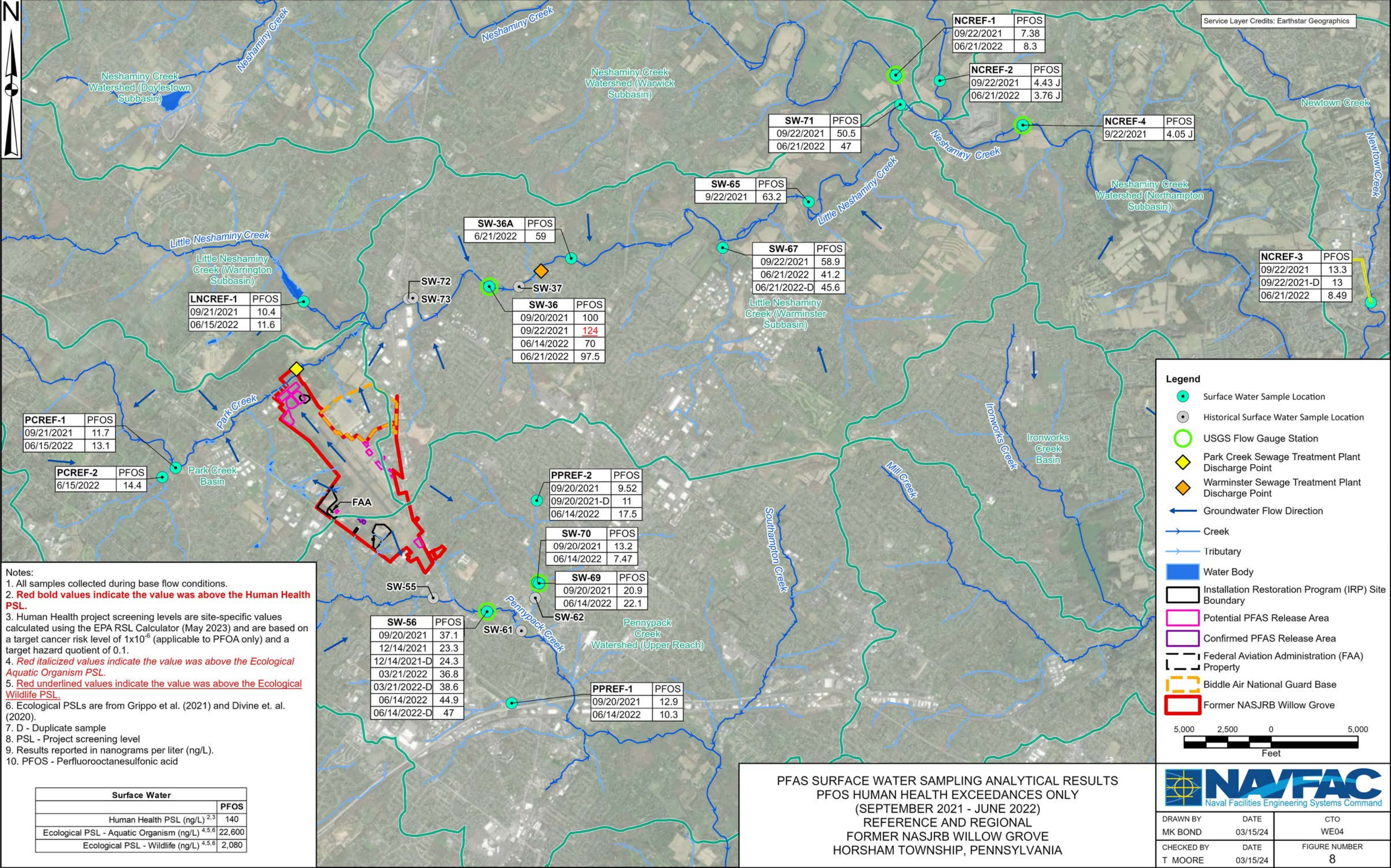
1,000 500 0 1,000
Feet

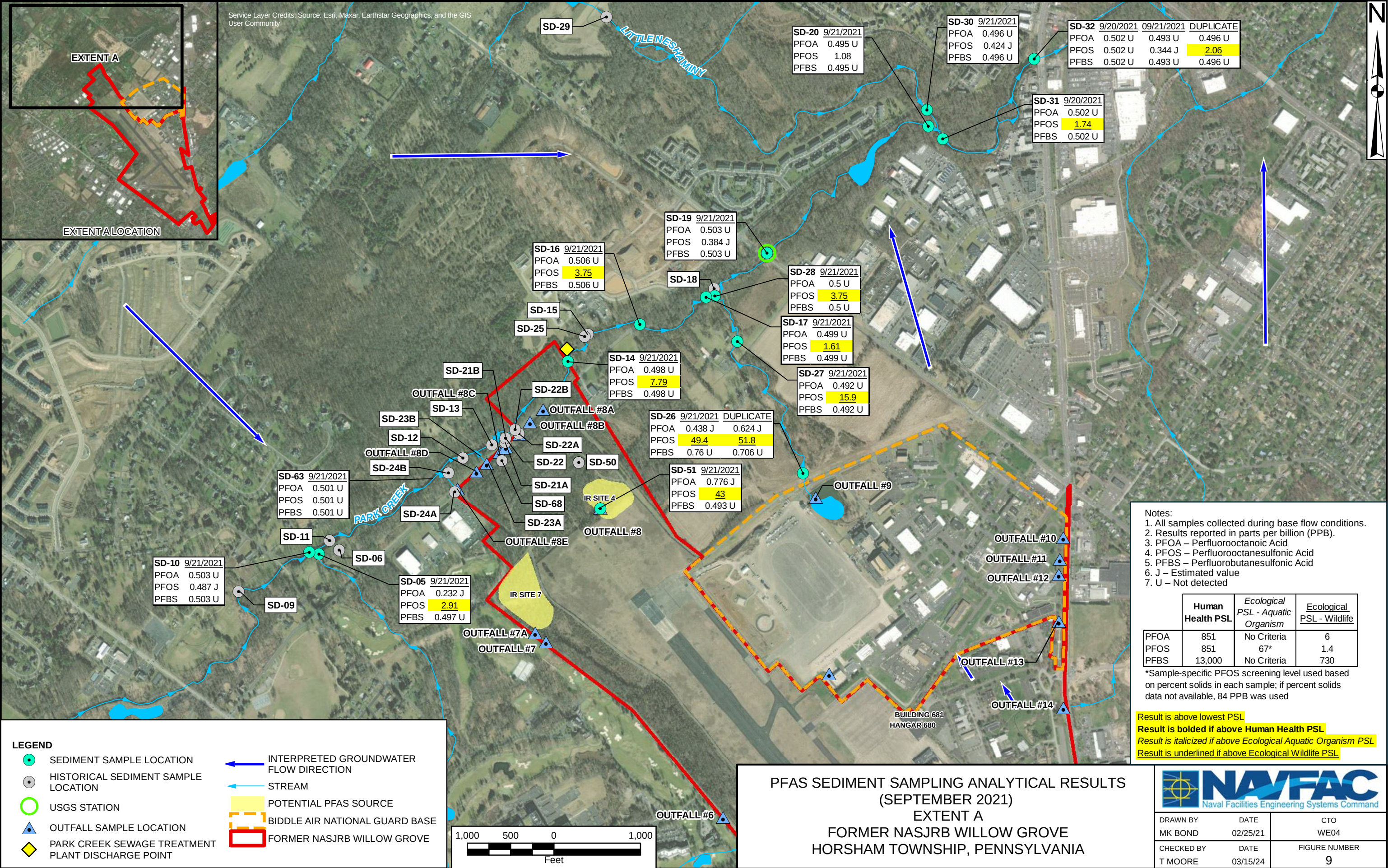


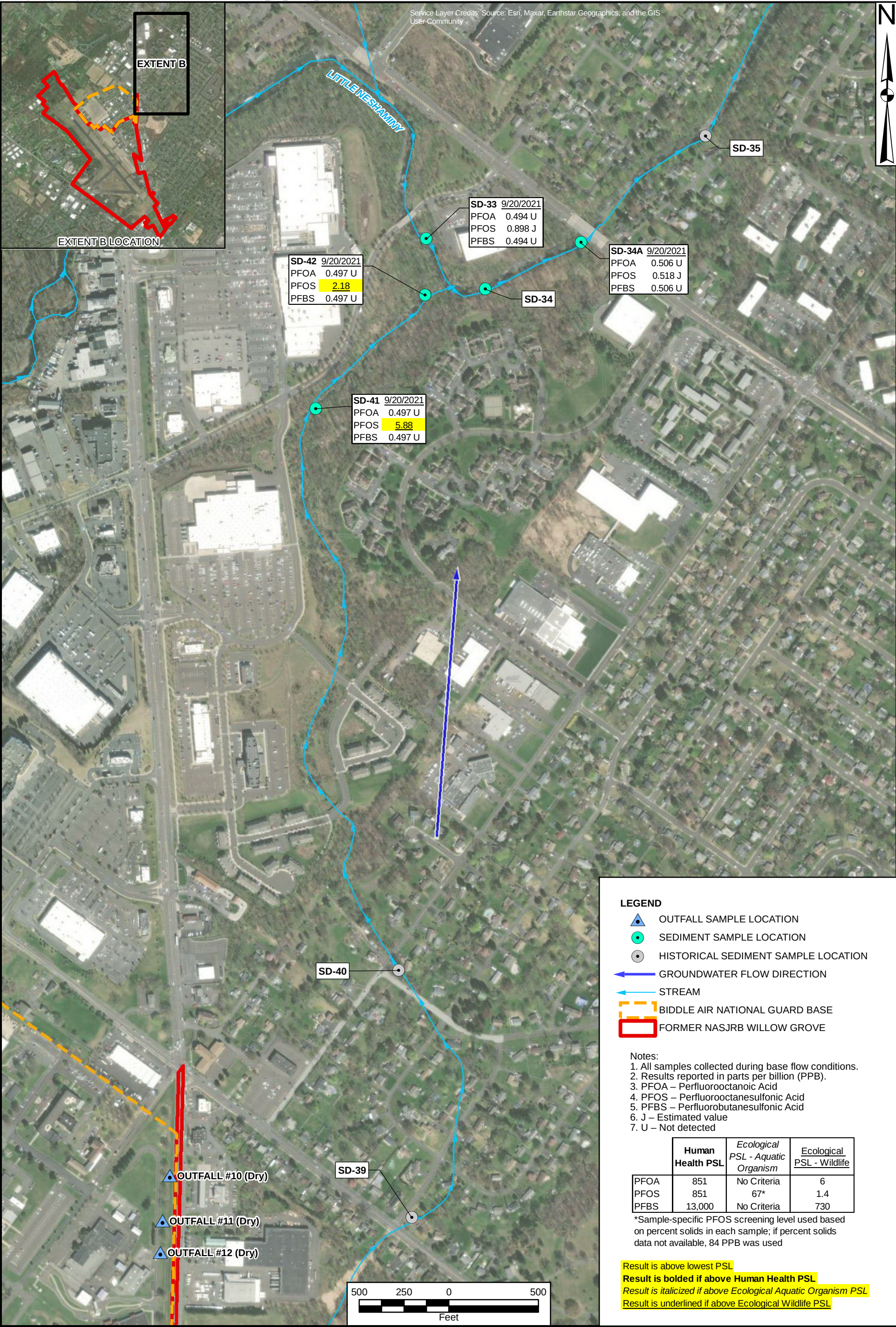
Naval Facilities Engineering Systems Command

DRAWN BY MK BOND	DATE 03/15/24	CTO WE04
CHECKED BY T MOORE	DATE 03/15/24	FIGURE NUMBER 6





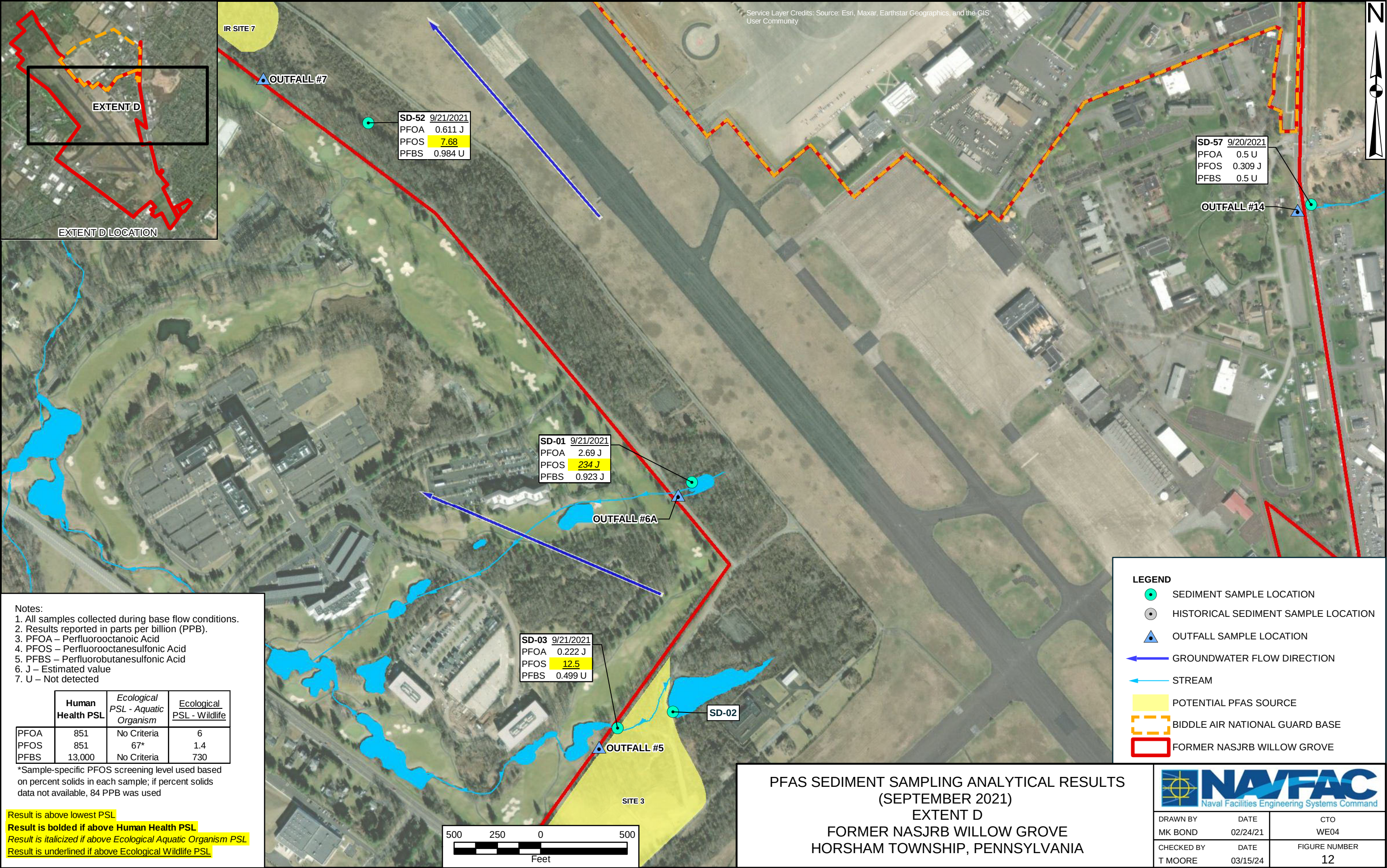


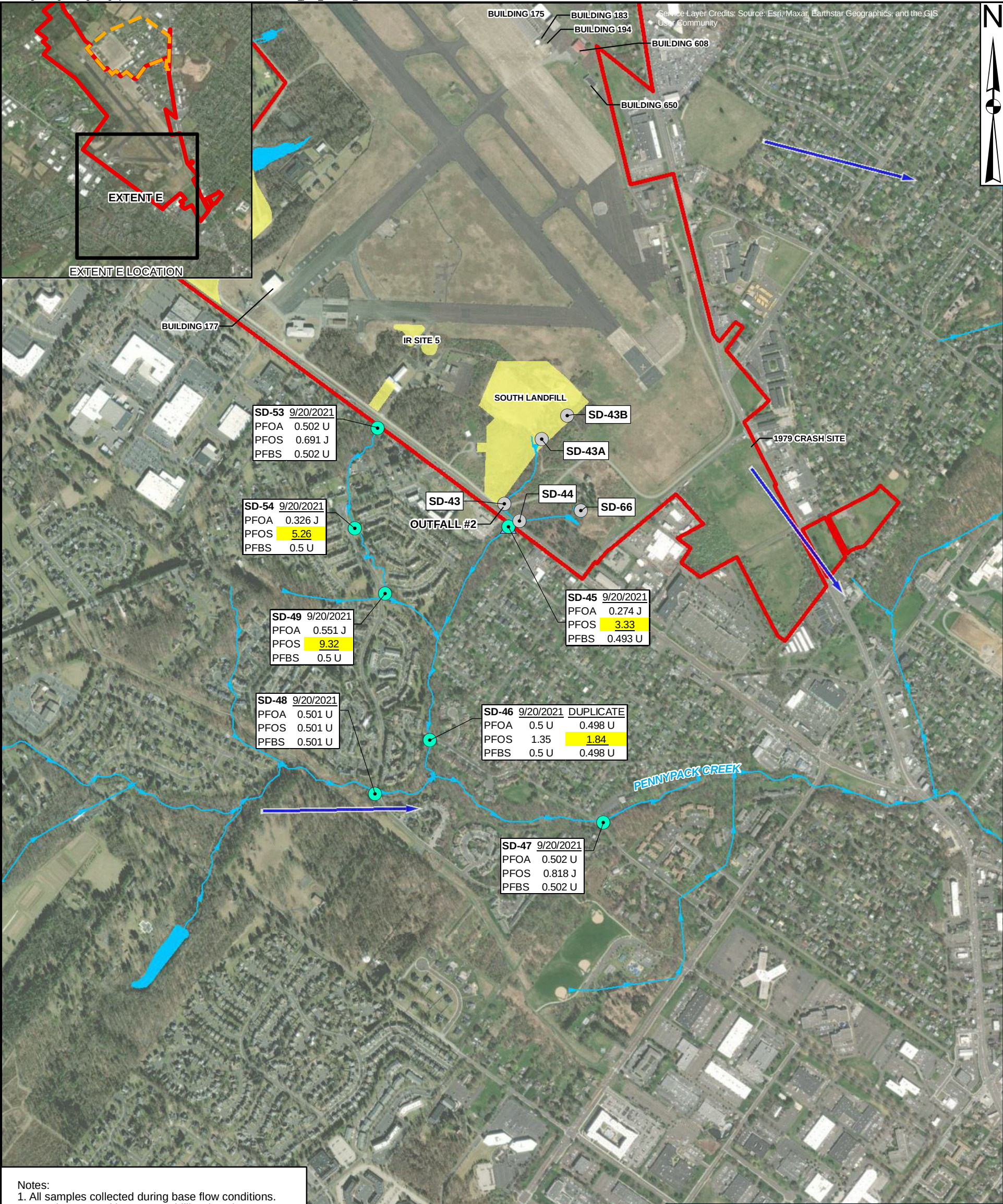


PFAS SEDIMENT SAMPLING ANALYTICAL RESULTS
(SEPTEMBER 2021)
EXTENT B
FORMER NASJRB WILLOW GROVE
HORSHAM TOWNSHIP, PENNSYLVANIA

 Naval Facilities Engineering Systems Command		
DRAWN BY MK BOND	DATE 02/24/21	CTO WE04
CHECKED BY T MOORE	DATE 03/15/24	FIGURE NUMBER 10







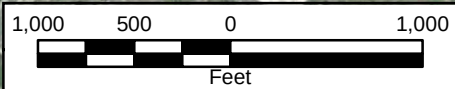
Notes:
1. All samples collected during base flow conditions.
2. Results reported in parts per billion (PPB).
3. PFOA – Perfluorooctanoic Acid
4. PFOS – Perfluorooctanesulfonic Acid
5. PFBS – Perfluorobutanesulfonic Acid
6. J – Estimated value
7. U – Not detected

	Human Health PSL	Ecological PSL - Aquatic Organism	Ecological PSL - Wildlife
PFOA	851	No Criteria	6
PFOS	851	67*	1.4
PFBS	13,000	No Criteria	730

*Sample-specific PFOS screening level used based on percent solids in each sample; if percent solids data not available, 84 PPB was used

Result is above lowest PSL
Result is bolded if above Human Health PSL
Result is italicized if above Ecological Aquatic Organism PSL
Result is underlined if above Ecological Wildlife PSL

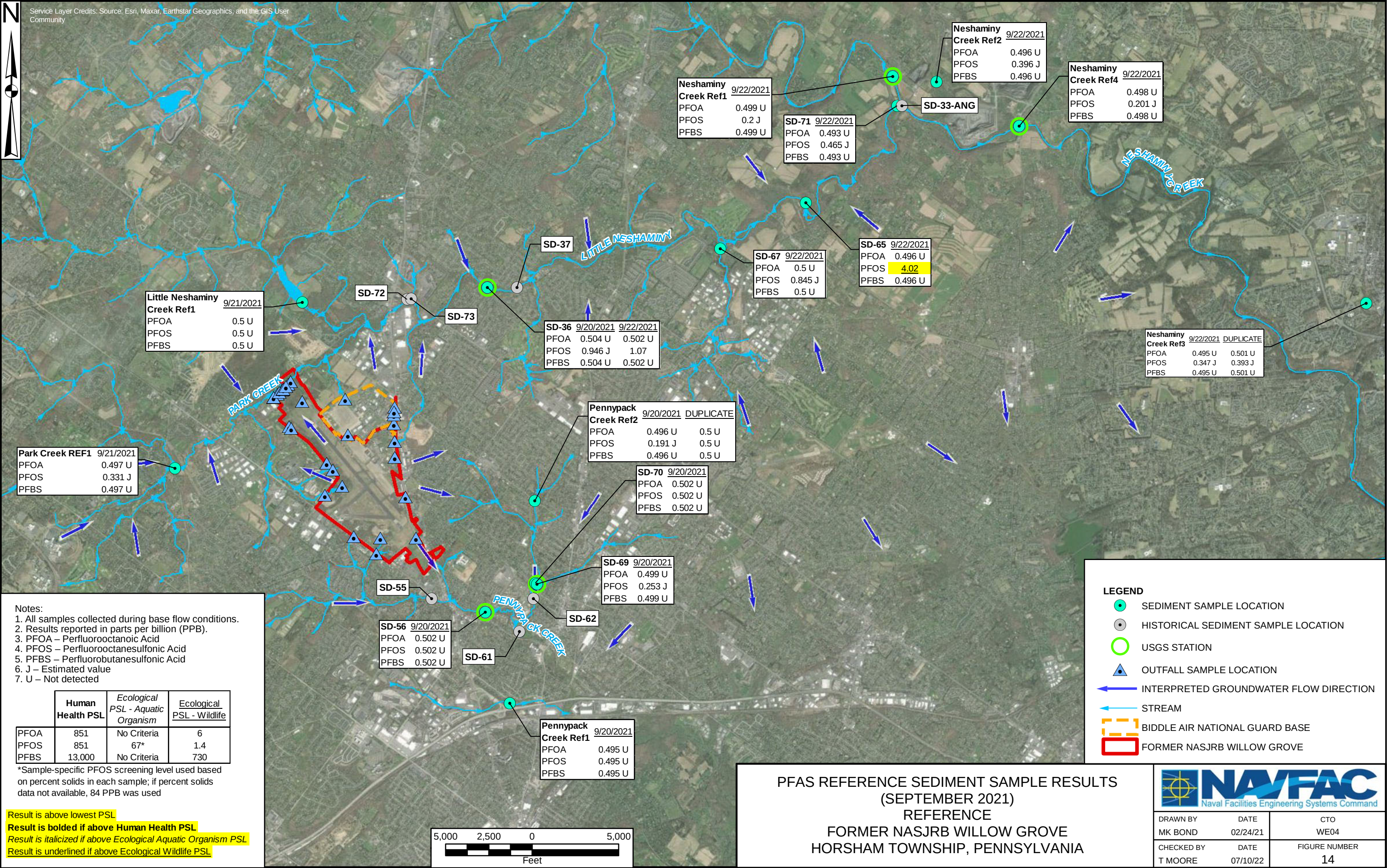
- LEGEND
- SEDIMENT SAMPLE LOCATION
 - HISTORICAL SEDIMENT SAMPLE LOCATION
 - OUTFALL SAMPLE LOCATION
 - USGS STATION
 - GROUNDWATER FLOW DIRECTION
 - STREAM
 - POTENTIAL PFAS SOURCE
 - BIDDLE AIR NATIONAL GUARD BASE
 - FORMER NASJRB WILLOW GROVE

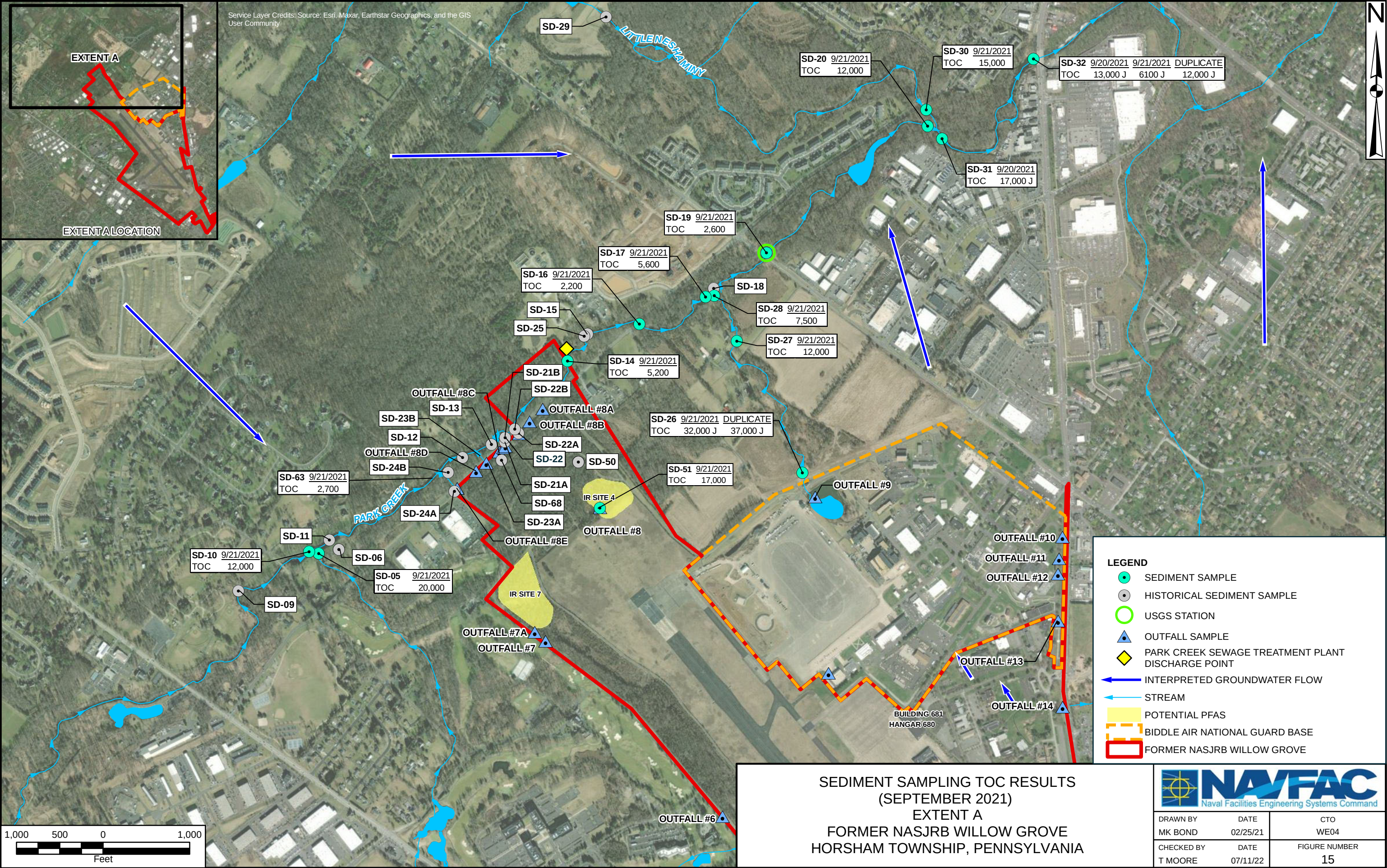


PFAS SEDIMENT SAMPLING ANALYTICAL RESULTS
(SEPTEMBER 2021)
EXTENT E
FORMER NASJRB WILLOW GROVE
HORSHAM TOWNSHIP, PENNSYLVANIA



DRAWN BY MK BOND	DATE 02/24/21	CTO WE04
CHECKED BY T MOORE	DATE 07/10/22	FIGURE NUMBER 13







SEDIMENT SAMPLING TOC RESULTS
(SEPTEMBER 2021)
EXTENT B
FORMER NASJRB WILLOW GROVE
HORSHAM TOWNSHIP, PENNSYLVANIA



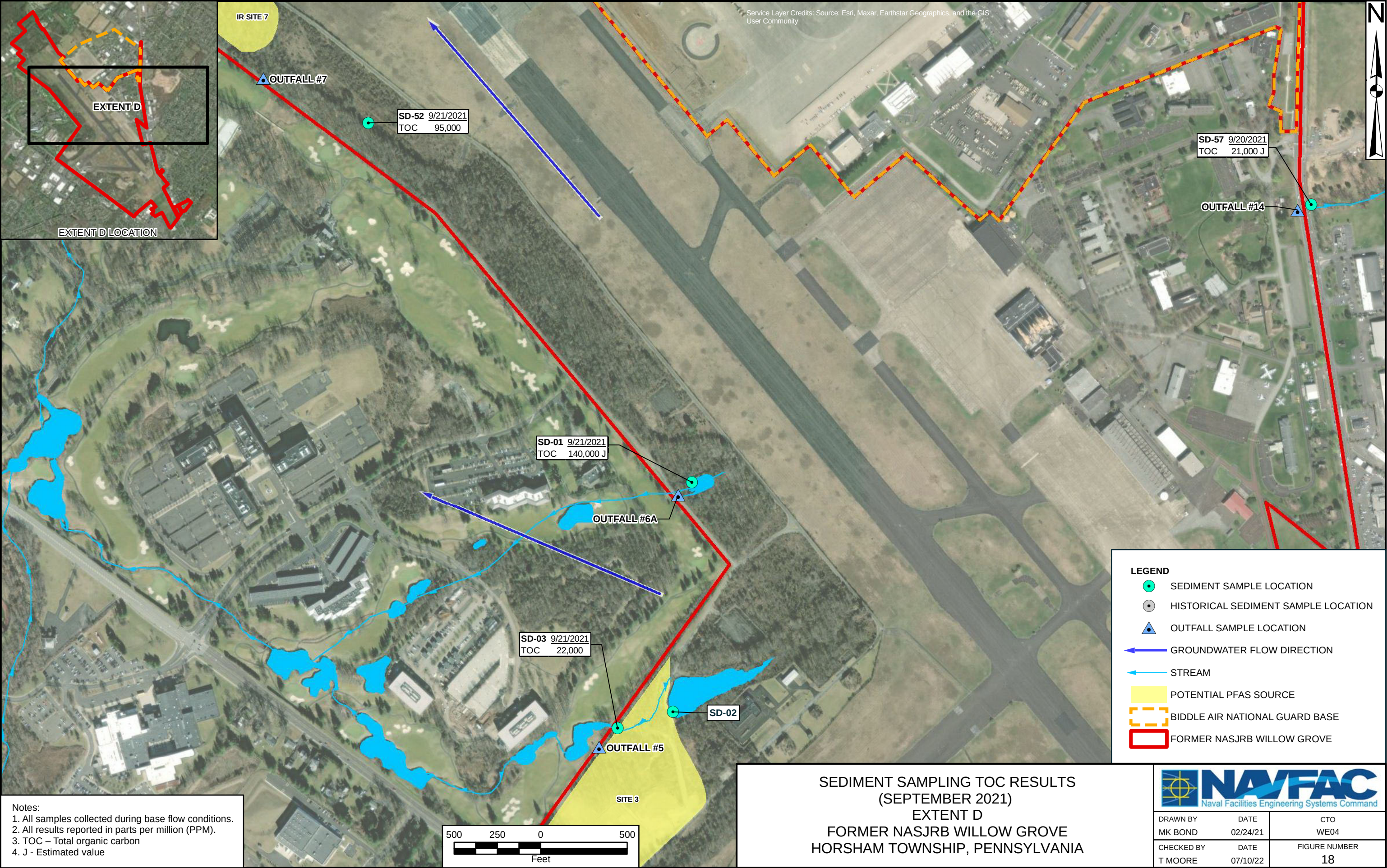
Naval Facilities Engineering Systems Command

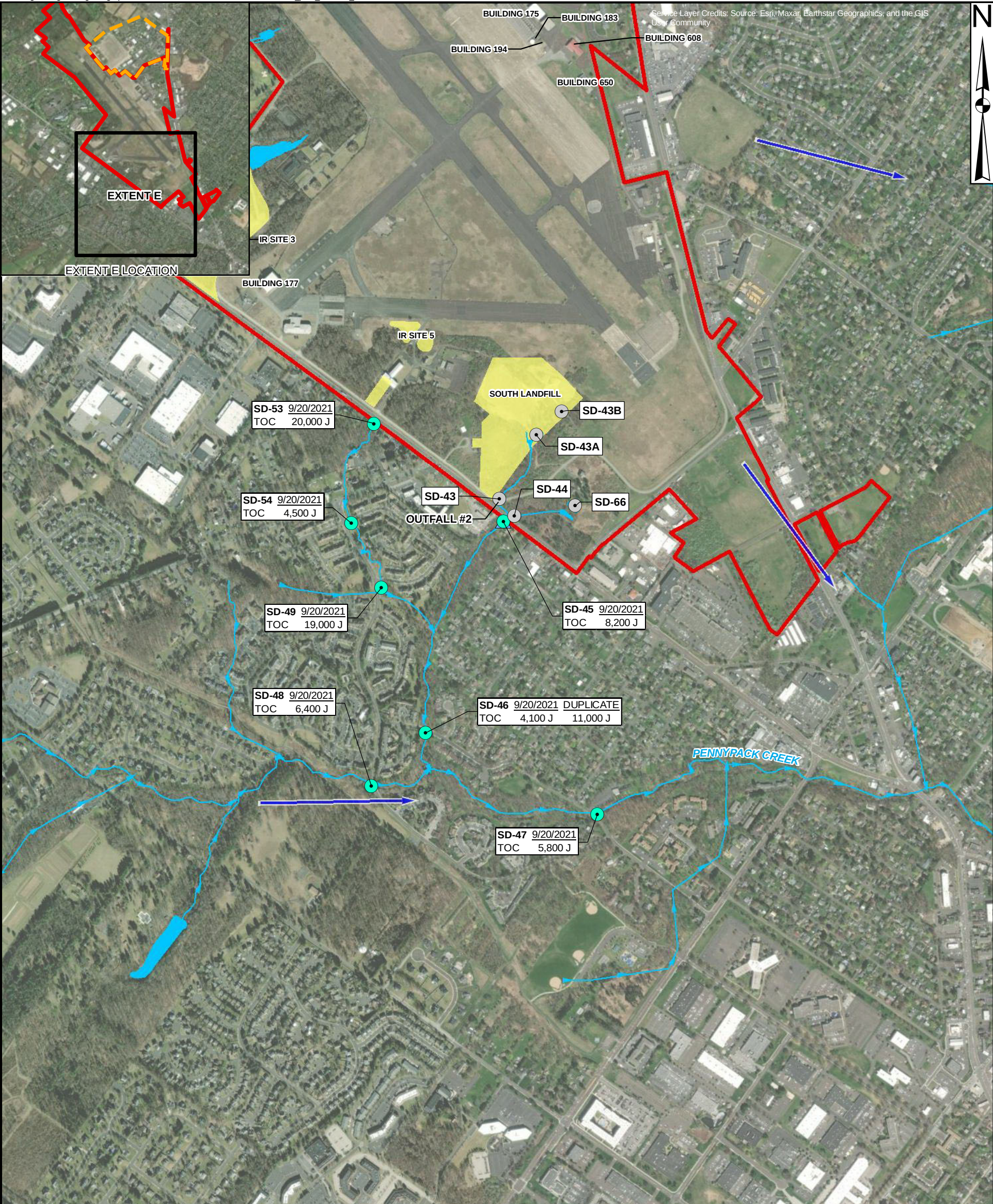
DRAWN BY MK BOND	DATE 02/24/21	CTO WE04
CHECKED BY T MOORE	DATE 07/08/22	FIGURE NUMBER 16

- LEGEND**
- ▲ OUTFALL SAMPLE LOCATION
 - SEDIMENT SAMPLE LOCATION
 - HISTORICAL SEDIMENT SAMPLE LOCATION
 - ← GROUNDWATER FLOW DIRECTION
 - STREAM
 - - - BIDDLE AIR NATIONAL GUARD BASE
 - ▭ FORMER NASJRB WILLOW GROVE
- Notes:
1. All samples collected during base flow conditions.
 2. All results reported in parts per million (PPM).
 3. TOC – Total organic carbon
 4. J - Estimated value

Service Layer Credits: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

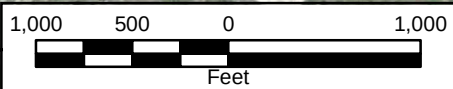






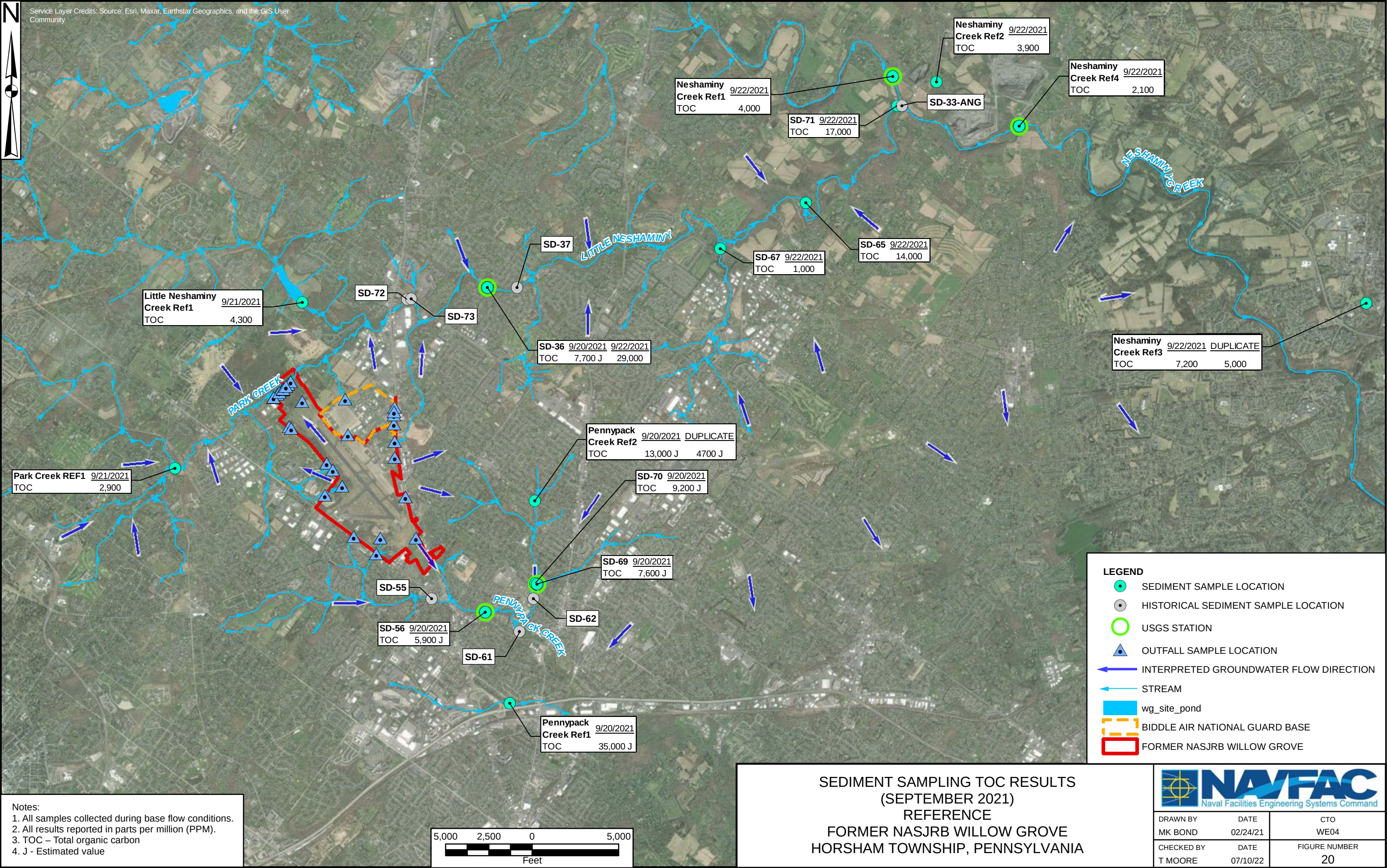
- LEGEND**
- SEDIMENT SAMPLE LOCATION
 - HISTORICAL SEDIMENT SAMPLE LOCATION
 - OUTFALL SAMPLE LOCATION
 - USGS STATION
 - GROUNDWATER FLOW DIRECTION
 - STREAM
 - POTENTIAL PFAS SOURCE
 - BIDDLE AIR NATIONAL GUARD BASE
 - FORMER NASJRB WILLOW GROVE

Notes:
1. All samples collected during base flow conditions.
2. All results reported in parts per million (PPM).
3. TOC – Total organic carbon
4. J - Estimated value



SEDIMENT SAMPLING TOC RESULTS
(SEPTEMBER 2021)
EXTENT E
FORMER NASJRB WILLOW GROVE
HORSHAM TOWNSHIP, PENNSYLVANIA

		
DRAWN BY	DATE	CTO
MK BOND	02/24/21	WE04
CHECKED BY	DATE	FIGURE NUMBER
T MOORE	07/11/22	19



Little Neshaminy
Creek Ref1
9/21/2021
TOC 4,300

Park Creek REF1
9/21/2021
TOC 2,900

Neshaminy
Creek Ref1
9/22/2021
TOC 4,000

SD-71
9/22/2021
TOC 17,000

Neshaminy
Creek Ref2
9/22/2021
TOC 3,900

Neshaminy
Creek Ref4
9/22/2021
TOC 2,100

SD-33-ANG

SD-67
9/22/2021
TOC 1,000

SD-65
9/22/2021
TOC 14,000

SD-37

SD-36
9/20/2021 9/22/2021
TOC 7,700 J 29,000

SD-72

SD-73

Pennypack
Creek Ref2
9/20/2021 DUPLICATE
TOC 13,000 J 4700 J

SD-70
9/20/2021
TOC 9,200 J

SD-69
9/20/2021
TOC 7,600 J

SD-55

SD-56
9/20/2021
TOC 5,900 J

SD-61

SD-62

Pennypack
Creek Ref1
9/20/2021
TOC 35,000 J