

**SITE INSPECTION EXECUTIVE SUMMARY  
FOR PER- AND POLYFLUOROALKYL SUBSTANCES AT  
FORT WINGATE, NEW MEXICO**



**U.S. ARMY**

**ODCS, G-9, ISE BRAC**

**Final  
December 2023**

## ACRONYMS AND ABBREVIATIONS

%	percent
%R	percent recovery
°C	degrees Celsius
AFFF	aqueous film-forming foam
amsl	above mean sea level
AOPI	Area of Potential Interest
APAR	Affected Property Assessment Report
Army	U.S. Army
bgs	below ground surface
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cm/sec	centimeters per second
CoC	chain-of-custody
CSM	conceptual site model
DCE	dichloroethylene
DERP	Defense Environmental Restoration Program
DoD	U.S. Department of Defense
DPT	Direct Push Technology
DQO	Data Quality Objective
DUA	data usability assessment
ELAP	Environmental Laboratory Accreditation Program
EIS	extracted internal standard
FD	field duplicate
FWDA	Fort Wingate Depot Activity
GPS	global positioning system
GW	groundwater
HFPO-DA	Hexafluoropropylene Oxide Dimer Acid (GenX)
HDPE	high-density polyethylene
HQ	hazard quotient
HQDA	Headquarters Department of the Army
ID	identification
IDW	investigation-derived waste
LC/MS/MS	liquid chromatography with tandem mass spectrometry
LCS	laboratory control sample
LOD	limit of detection
LOQ	limit of quantitation
LUC	land use control
LUCIP	LUC Implementation Plan
mg/kg	milligrams per kilogram
MIL-SPEC	Military Specification
MS	matrix spike
MSD	matrix spike duplicate

NCP	National Oil and Hazardous Substances Pollution Contingency Plan
ng/L	nanograms per liter
NPL	National Priorities List
OSD	Office of the Secretary of Defense
PA	Preliminary Assessment
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCL	protective contamination levels
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutane sulfonate
PFHxS	perfluorohexane sulfonate
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PMZ	plume management zone
PRB	permeable reactive barrier
PPE	personal protective equipment
PVC	polyvinyl chloride
QA	quality assurance
QC	quality control
QSM	Quality Systems Manual
RACR	Response Action Complete Report
RAP	Remediation Action Plan
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RPD	relative percent difference
RSL	regional screening level
SDG	sample delivery group
SGS	SGS North America, Inc.
SI	Site Inspection
SL	screening level
SO	soil
SOP	standard operating procedure
SVOC	semivolatile organic compound
TCA	trichloroethane
TCE	trichloroethylene
TCLP	toxicity characteristic leaching procedure
TGI	technical guidance instruction
UFP-QAPP	Uniform Federal Policy Quality Assurance Project Plan
U.S.	United States
USACE	U.S. Army Corps of Engineers
USDOT	U. S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
VOC	Volatile Organic Compound

## EXECUTIVE SUMMARY

The United States (U.S.) Army (Army) is conducting Preliminary Assessments (PAs) and Site Inspections (SIs) to determine the use, storage, disposal, or release of per- and polyfluoroalkyl substances (PFAS) at Base Realignment and Closure (BRAC) installations. This report documents SI activities conducted for six areas of potential interest (AOPIs) at the Fort Wingate Depot Activity (FWDA) in McKinley County, New Mexico. AOPIs were identified during the PA phase for investigation through multimedia sampling in an SI phase to determine whether a PFAS release occurred. Activities were completed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (CERCLA, 42 U.S.C. §9601, et. seq.), the Defense Environmental Restoration Program (DERP, 10 U.S.C. §2700, et. seq.) the National Oil and Hazardous Substances Pollution Contingency Plan (NCP, 40 CFR Part 300), and Army and U.S. Department of Defense (DoD) policy and guidance, and U.S. Environmental Protection Agency (USEPA) guidance. FWDA was identified in the 1988 BRAC round for future transfer and reuse.

The purpose of PA was to identify areas where PFAS-containing materials were used, stored, and/or disposed of, or areas where known or suspected releases to the environment occurred. These areas are referred to as Areas of Potential Interest (AOPIs). The PA analyzed FDWA for any activity related to PFAS containing compounds. These activities include, but are not limited to, firefighting training (and storage firefighting equipment) and metal plating activities. Once the AOPIs were identified, each AOPI was analyzed further to determine if SI level sampling activities were required at each. The PA identified six AOPIs that required SI activities.

The SI followed established USEPA guidance as well as DoD policy and guidance for investigating perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), perfluorobutane sulfonate (PFBS), perfluorononanoic acid (PFNA), perfluorohexane sulfonate (PFHxS), and hexafluoropropylene oxide dimer acid (HFPO-DA) (also known as GenX) (DoD 2022). Since PFAS is a large grouping consisting of thousands of individual chemicals, PFOA, PFOS, PFBS, PFNA, and PFHxS altogether will be referred to in this report as “Target PFAS.”

During the SI activities, soil and groundwater were sampled at the six identified AOPIs to determine PFAS containing substances are present above levels that require further investigation. The samples were collected using DoD Quality Systems Manual (QSM) Version 5.3, Table B-15 (DOD 2019). The purpose of the SI was to confirm either absence or a release of PFAS compounds. If the SI confirmed a release of the Target PFAS compounds, further investigation is required.

To determine if further investigation beyond the SI is warranted at each AOPI, Analytical results for samples collected during this SI were compared to residential scenario screening levels (SLs) calculated using the USEPA’s regional screening level calculator for soil and the tap water criteria for groundwater, as published in the 2022 Office of the Secretary of Defense (OSD) Memorandum (DoD 2022). Of the six PFAS compounds presented in the 06 July 2022 OSD memorandum, HFPO-DA (commonly referred to as GenX) was not sampled. The presence of HFPO-DA is not anticipated at FWDA because HFPO-DA is generally not a component of military specification (MIL-SPEC) aqueous film forming foam (AFFF). Also, based on GenX’s history, including

distribution limitations that restricted its use, GenX is generally not a component of other products the military used.

Of the six AOPIs sampled in the SI, five of the AOPIs had sampling results above the SLs. Table 1 below summarizes the AOPIs investigated during the SI, and recommendations for further investigation.

**Table 1. Summary of AOPIs and Recommendations for Further Investigation**

AOPI Name	Exceedance of SLs		Recommendation
	Groundwater	Soil	
Fire Station (Figure 3)	Exceeds SL	Exceeds SL	SLs exceeded in groundwater and in soil; further investigation recommended
Building 5 Maintenance Garage (Figure 3)	Exceeds SL	Detected	SLs exceeded in groundwater; further investigation recommended
Building 15 Maintenance Garage (Figure 3)	Exceeds SL	Detected	SLs exceeded in groundwater; further investigation recommended
Fire Training Ground (Figure 4)	Detected	Exceeds SL	SLs exceeded in soil; further investigation recommended
Sewage Disposal Plant (Figure 5)	NS due to monitoring well condition	Equals SL	SLs not exceeded, but a Target PFAS concentration detected in soil equals <sup>1</sup> the SL and groundwater data is not available. Therefore, further investigation is recommended at this time
Central Landfill (Figure 6)	NS	Detected	SLs not exceeded; further investigation not recommended at this time

**Notes:**

*Highlighted values indicate AOPIs with a recommendation for further investigation.*

*AOPI – area of potential interest*

*ND – non-detect*

*NS – not sampled*

*SL – screening level*

<sup>1</sup> Recommendation made based on PFOS value of 0.0127 milligrams per kilogram (mg/kg) in soil sample FWDA-SDP-SO-02, which when rounded up equals the SL of 0.013 mg/kg.

The attached figures depicts a map of AOPIs and PFAS results. The results that exceed the SLs are highlighted grey. The figure also includes arrows to depict the direction of Groundwater.

The Groundwater at FWDA is not used for drinking water purposes at this time. The Army BRAC office will continue PFAS investigations by entering into a Remedial Investigation (RI), which

will determine the extent of the PFAS releases. During this time, stakeholders will be involved with the planning and have input into further sampling locations.

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# FIGURES

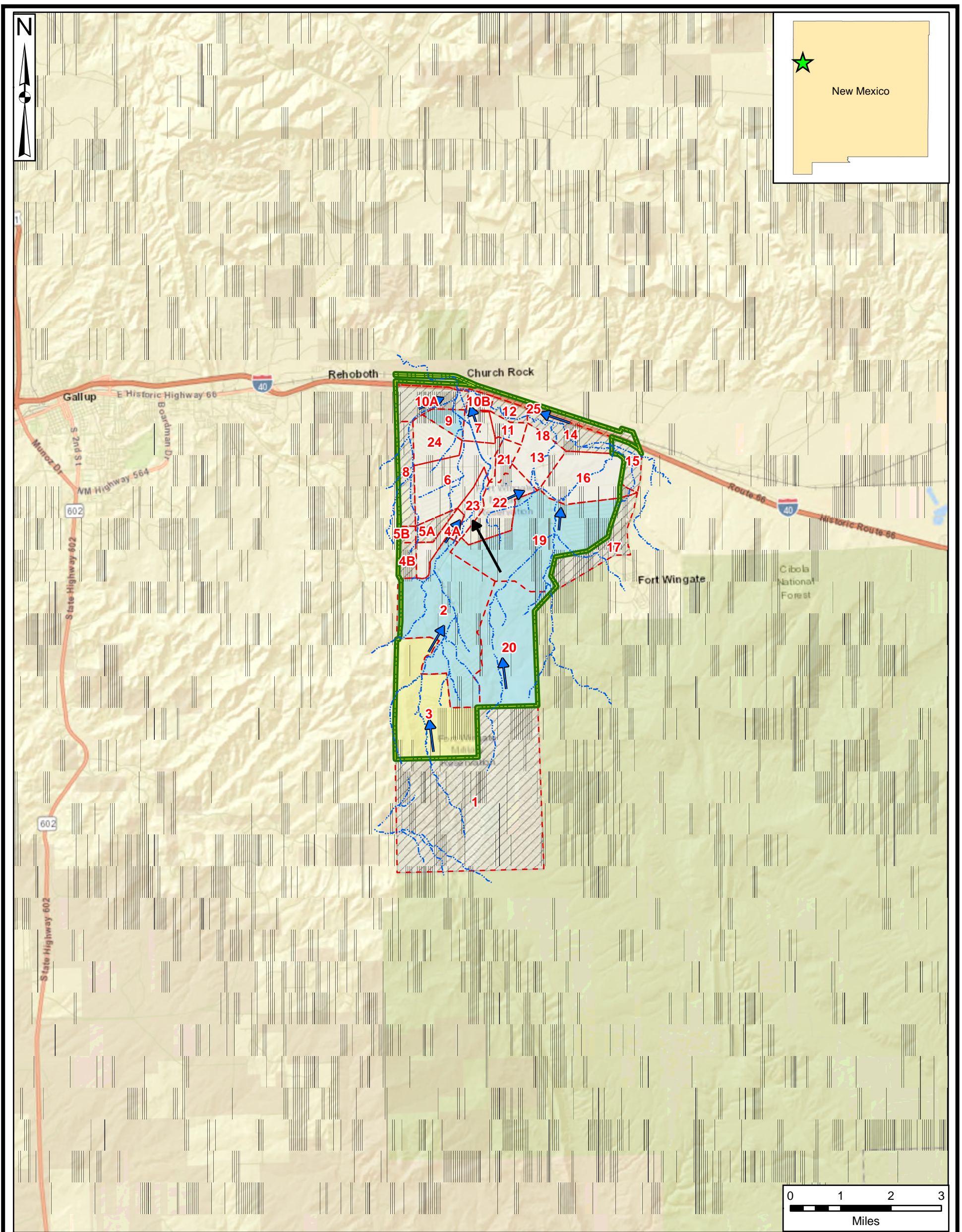


Figure 1: Installation Location

**Legend**

- Installation Boundary
- Arroyo
- Surface Water Flow Direction
- General Groundwater Flow Direction
- Parcel Boundary

**Parcel Status**

- Army
- Army Retain
- Army, Leased to MDA
- Transferred to Department of Interior

Abbreviations:  
AOPI = Area of potential Interest

Data Sources:  
USACE, GIS Data, 2022  
ESRI, ArcGIS Online, Aerial Imagery

Coordinate System:  
WGS84, UTM Zone 12 North



**Site Inspections (SI)  
of Per-and Polyfluoroalkyl  
Substances  
(PFAS)**

Location: Fort Wingate, NM

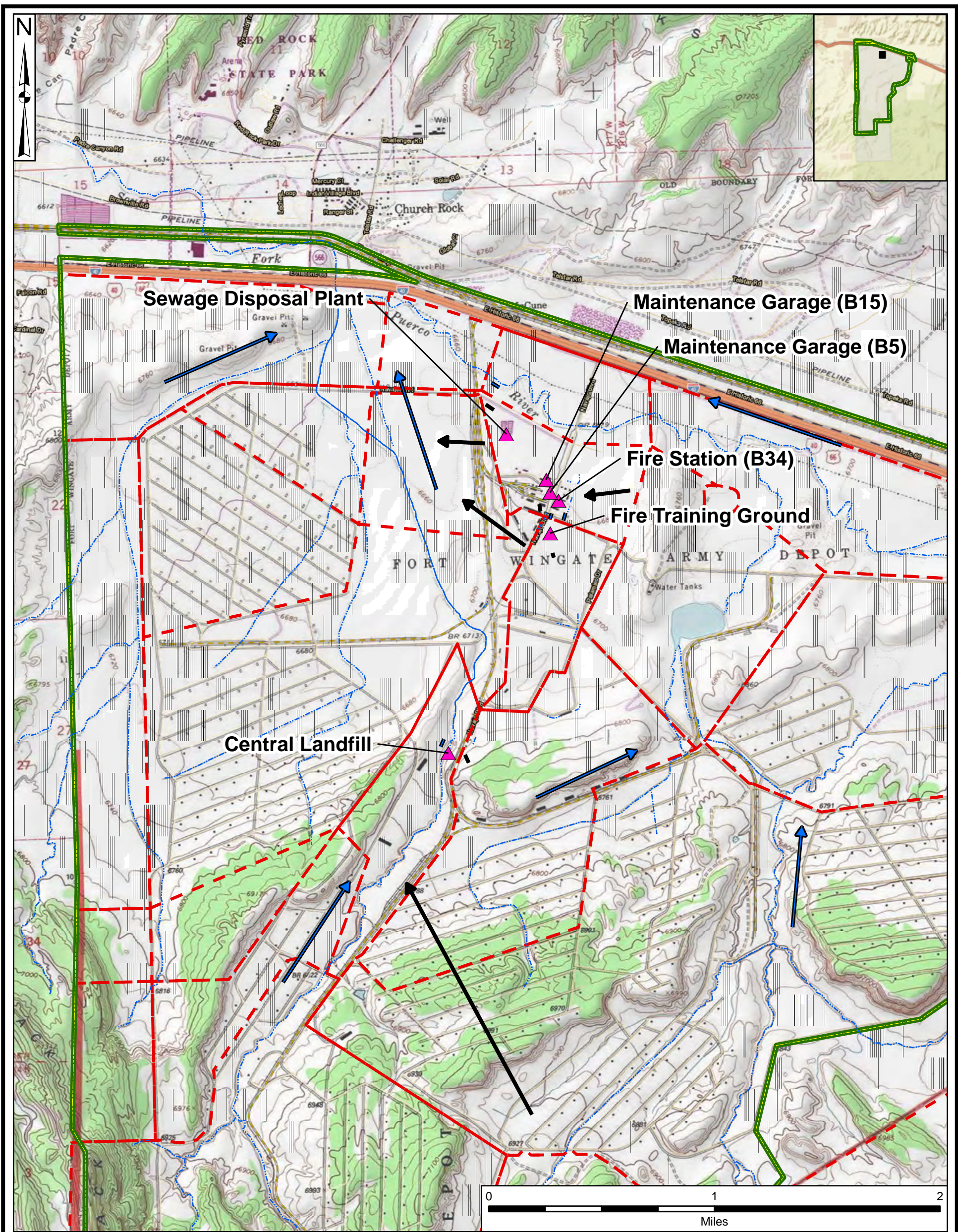









Figure 2: Site Features

<p><b>Legend</b></p> <ul style="list-style-type: none"> <li> Installation Boundary</li> <li> Arroyo</li> <li> Surface Water Flow Direction</li> <li> General Groundwater Flow Direction</li> <li> AOPI Location</li> <li> Parcel Boundary</li> </ul>	<p>Abbreviations: AOPI = Area of potential Interest</p> <p>Data Sources: USACE, GIS Data, 2022 USGS, NHD Data, 2022 ESRI, ArcGIS Online, Aerial Imagery, USA Topo Map</p> <p>Coordinate System: WGS84, UTM Zone 12 North</p>	<p style="text-align: center;"></p> <p style="text-align: center;"><b>Site Inspections (SI) of Per-and Polyfluoroalkyl Substances (PFAS)</b></p> <p style="text-align: center;">Location: Fort Wingate, NM</p>
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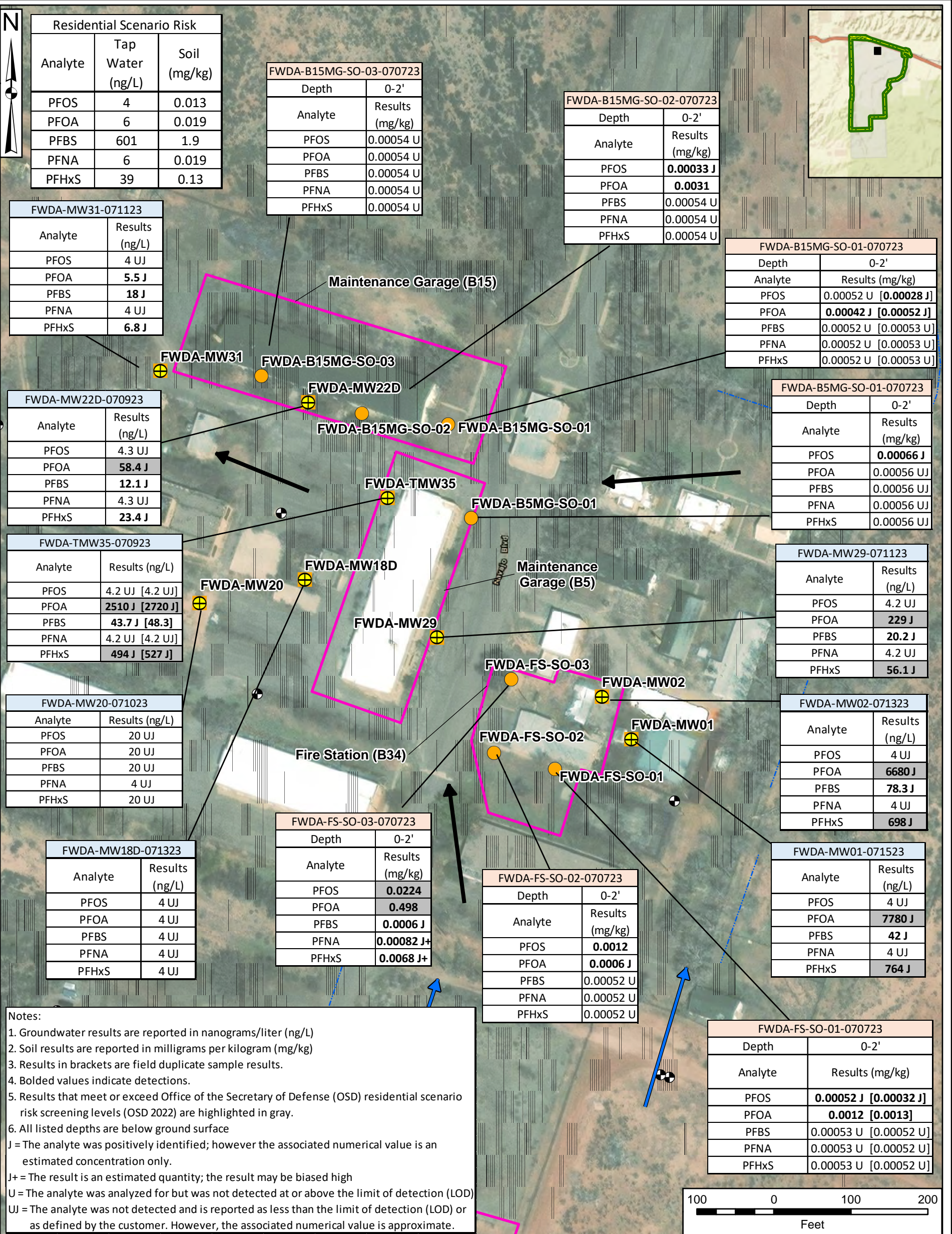


Figure 3: Fire Station and Maintenance Garages Sample Results

**Legend**

- Installation Boundary
- AOPI
- Arroyo
- Alluvium Monitoring Well
- Existing Groundwater Monitoring Well Sampled
- Surface Soil (Hand Auger)
- General Groundwater Flow Direction
- Surface Water Flow Direction

Abbreviations:  
 AOPI = Area of potential Interest  
 PFBS = perfluorobutanesulfonic acid  
 PFHxS = perfluorohexane sulfonate  
 PFNA = perfluorononanoic acid  
 PFOA = perfluorooctanoic acid  
 PFOS = perfluorooctane sulfonate

Data Sources:  
 USACE, GIS Data, 2022  
 ESRI, ArcGIS Online, Aerial Imagery

Coordinate System:  
 WGS84, UTM Zone 12 North



**Site Inspections (SI)  
of Per- and Polyfluoroalkyl  
Substances (PFAS)**

Location: Fort Wingate, NM

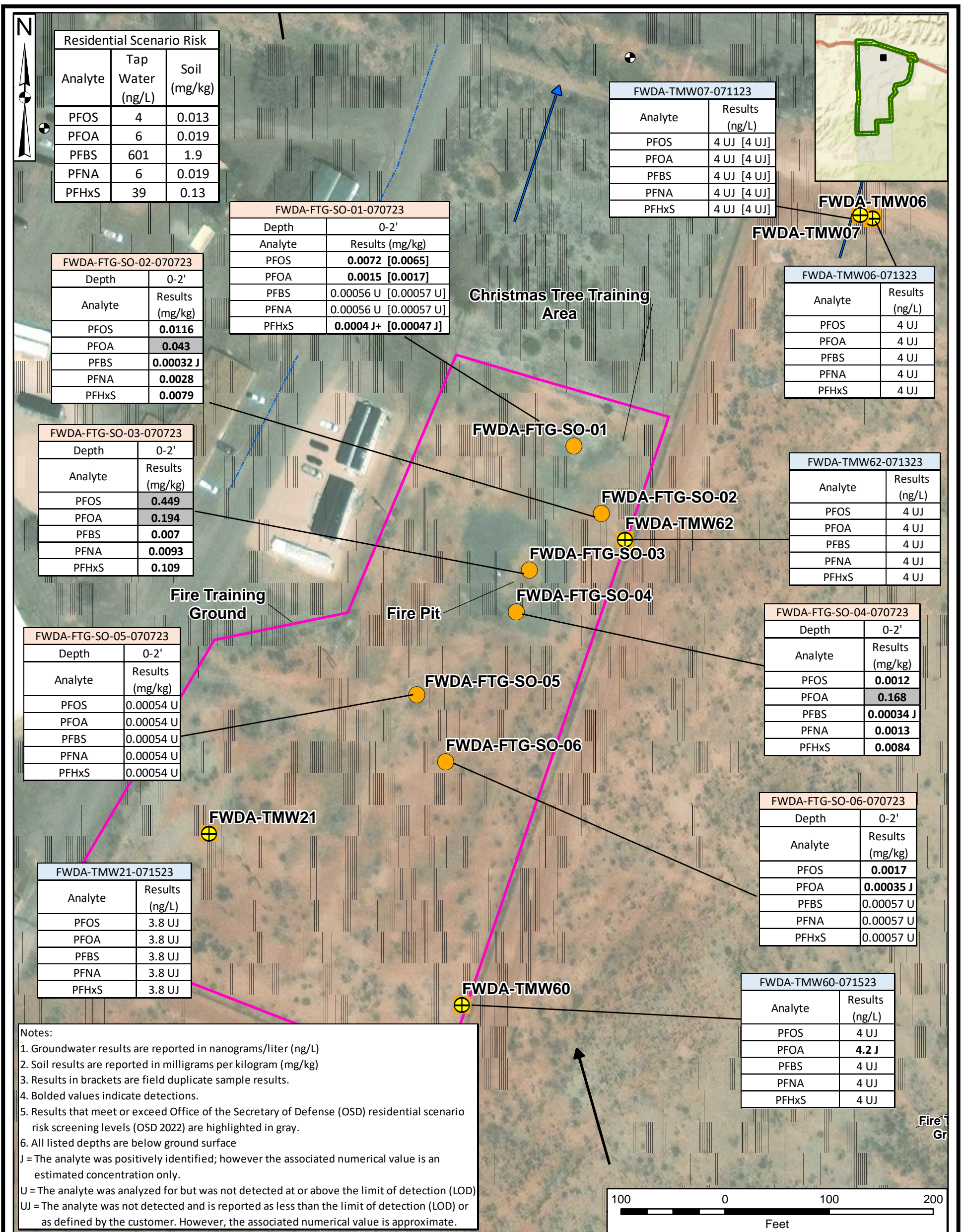


Figure 4: Fire Training Ground Sample Results

**Legend**

- Installation Boundary
- AOPI
- Arroyo
- Alluvium Monitoring Well
- Existing Groundwater Monitoring Well Sampled
- Surface Soil (Hand Auger)
- General Groundwater Flow Direction
- Surface Water Flow Direction

Abbreviations:  
 AOPI = Area of potential Interest  
 PFBS = perfluorobutanesulfonic acid  
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Data Sources:  
 USACE, GIS Data, 2022  
 ESRI, ArcGIS Online, Aerial Imagery

Coordinate System:  
 WGS84, UTM Zone 12 North



Site Inspections (SI)  
 of Per- and Polyfluoroalkyl  
 Substances (PFAS)

Location: Fort Wingate, NM

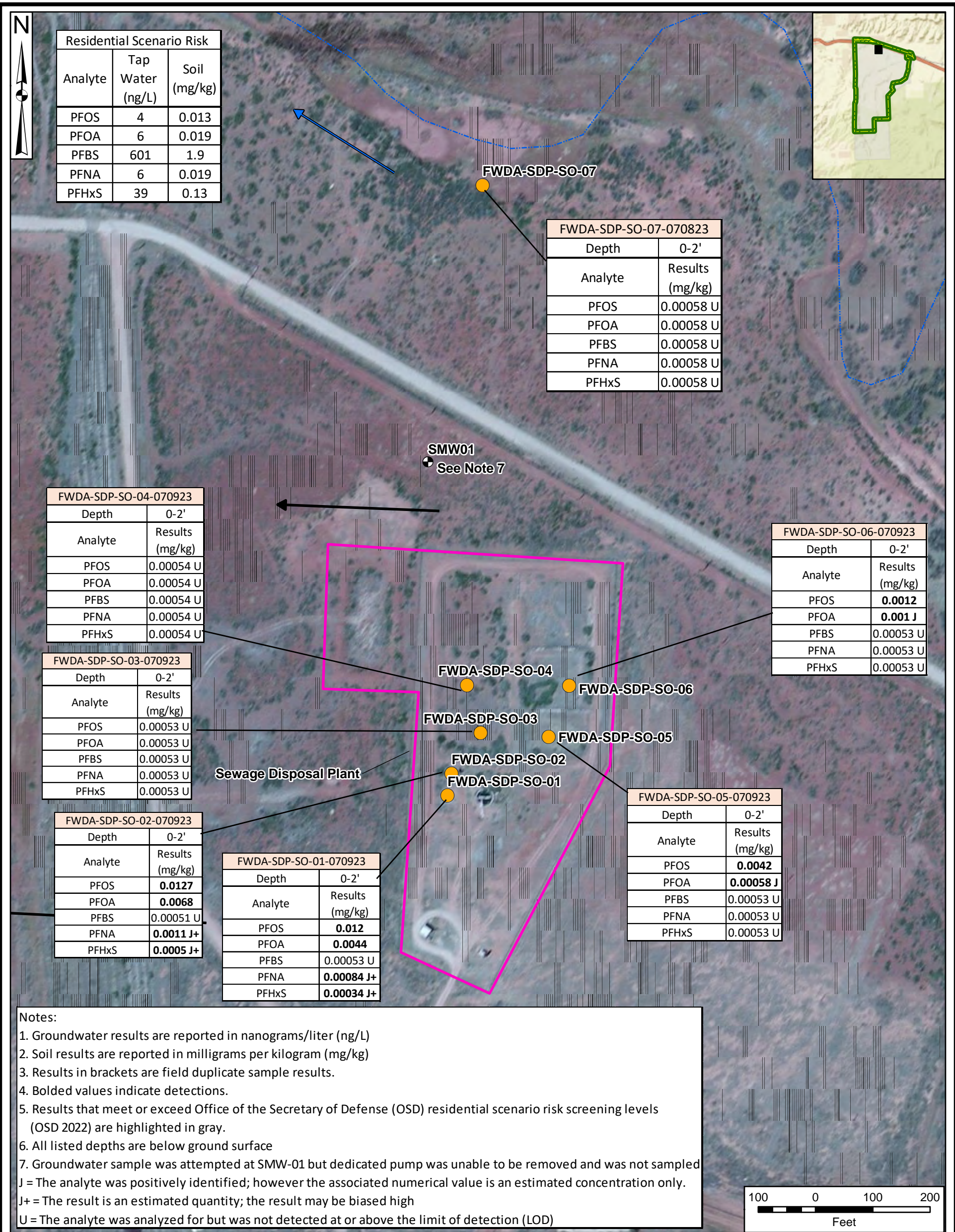


Figure 5: Sewage Disposal Plant Sample Results

**Legend**

- Installation Boundary
- AOPI
- Arroyo
- Alluvium Monitoring Well
- Surface Soil (Hand Auger)
- General Groundwater Flow Direction
- Surface Water Flow Direction

**Abbreviations:**  
 AOPI = Area of potential Interest  
 PFBS = perfluorobutanesulfonic acid  
 PFHxS = perfluorohexane sulfonate  
 PFNA = perfluorononanoic acid  
 PFOA = perfluorooctanoic acid  
 PFOS = perfluorooctane sulfonate

**Data Sources:**  
 USACE, GIS Data, 2022  
 ESRI, ArcGIS Online, Aerial Imagery

**Coordinate System:**  
 WGS84, UTM Zone 12 North

**ALEUT**

**Site Inspections (SI) of Per-and Polyfluoroalkyl Substances (PFAS)**

Location: Fort Wingate, NM

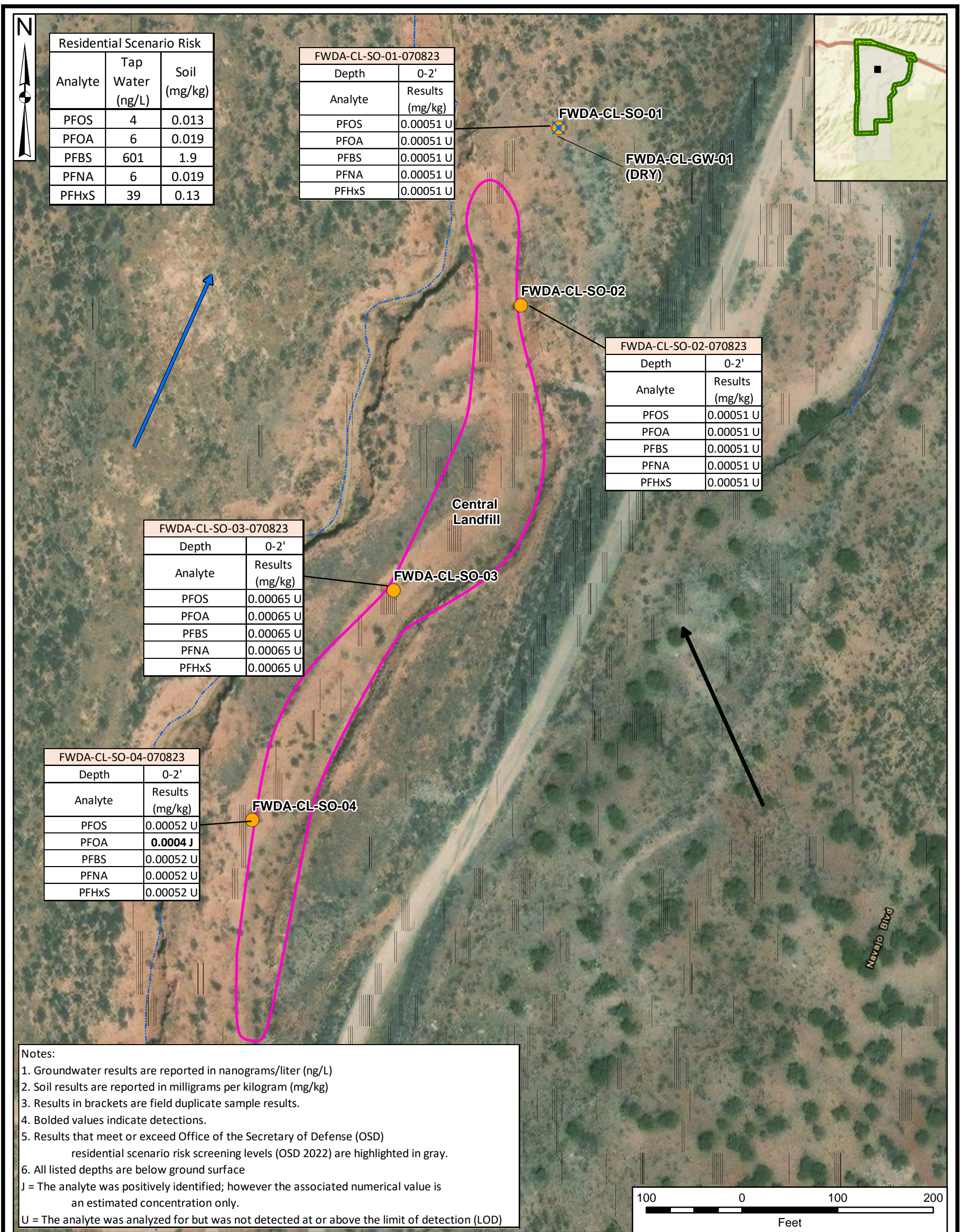


Figure 6: Central Landfill Sample Results

**Legend**

- Installation Boundary
- AOPI
- Arroyo
- Surface Soil (Hand Auger)
- Surface Soil (Hand Auger) and attempted Groundwater Sample
- General Groundwater Flow Direction
- Surface Water Flow Direction

Abbreviations:  
 AOPI = Area of potential Interest  
 PFBS = perfluorobutanesulfonic acid  
 PFHxS = perfluorohexane sulfonate  
 PFNA = perfluorononanoic acid  
 PFOA = perfluorooctanoic acid  
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Data Sources:  
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