

**SEWAGE TREATMENT PLANT #1 AREA, SWMU 117  
PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)  
SITE ASSESSMENT PROGRESS REPORT  
KENNEDY SPACE CENTER, FLORIDA**

**Prepared for:**



**National Aeronautics and Space Administration  
Kennedy Space Center, Florida**

**April 2023  
Revision 0**

**Prepared by:**

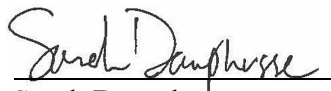
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National Aeronautics and Space Administration  
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**April 2023**

## PROFESSIONAL ENGINEER CERTIFICATION

This Per-and Polyfluoroalkyl Substances (PFAS) Site Assessment Progress Report for the Sewage Treatment Plant #1 Area, Solid Waste Management Unit 117, Kennedy Space Center, Florida, dated April 2023, has been prepared by or under the responsible supervision, direction, or control of the Florida-licensed professional engineer whose signature and seal appear below. This document and the work described herein complies with standard professional practices and the requirements of Chapter 62-780, Florida Administrative Code (F.A.C.) and other rules of the Florida Department of Environmental Protection according to Rule 62-780.400(1), F.A.C.



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## ABBREVIATIONS AND ACRONYMS

ADP	Advance Data Package
AS	Air Sparging
AFFF	Aqueous Film-Forming Foam
bls	below land surface
CS	Confirmatory Sampling
DoD	U.S. Department of Defense
DPT	Direct Push Technology
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
ft	feet or foot
HDPE	high density polyethylene
HFPO-DA	hexafluoropropylene oxide dimer acid (GenX)
HQ	Hazard Quotient
IDW	Investigation Derived Waste
IM	Interim Measure
KSC	Kennedy Space Center
KSCRT	KSC Remediation Team
LC/MS/MS	Liquid Chromatography Tandem Mass Spectrometry
LOC	Location of Concern
NADC	Natural Attenuation Default Concentration
NASA	National Aeronautics and Space Administration
mg/kg	milligram per kilogram
ng/L	nanograms per liter
PCB	polychlorinated biphenyl
PFAS	Per- and Polyfluoroalkyl Substances
PFBS	Perfluoro-1-butanesulfonic acid
PFHxS	Perfluorohexanesulfonic acid
PFNA	Perfluoro-n-nonanoic acid
PFOA	Perfluoro-n-octanoic acid

## **ABBREVIATIONS AND ACRONYMS (Continued)**

PFOS	Perfluorooctanesulfonic acid
pGCTL	provisional Groundwater Cleanup Target Level
POL	Paint and Oil Locker
PRL	Potential Release Location
QA/QC	Quality Assurance/Quality Control
QSM	Quality Systems Manual
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RSL	Regional Screening Level
SA	Site Assessment
SAPR	Site Assessment Progress Report
SCTL	Soil Cleanup Target Level
SE	Southeast
SOP	Standard Operating Procedure
STP1	Sewage Treatment Plant #1
SW3	Supply Warehouse #3
SWMU	Solid Waste Management Unit
SWSL	Surface Water Screening Level
TCE	trichloroethene
TOC	total organic carbon
µg/kg	microgram per kilogram
USEPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds
WWTP	Wastewater Treatment Plant

## EXECUTIVE SUMMARY

This Per-and Polyfluoroalkyl Substances (PFAS) Site Assessment (SA) Progress Report (SAPR) presents the activities and results associated with PFAS investigations in the Sewage Treatment Plant #1 (STP1) Area located at Kennedy Space Center (KSC), Florida. STP1 has been designated Solid Waste Management Unit (SWMU) 117 under KSC's Resource Conservation and Recovery Act (RCRA) Corrective Action Program because STP1 was identified as the potential source of PFAS to the environment in this area. This is the first progress report to document on-going SA activities; supplemental progress reports will be provided as additional data is collected.

PFAS SA activities were conducted between April 2020 and March 2022 to collect additional data to supplement the existing datasets to better understand the extent of PFAS impacts to the environment in the STP1 Area. The SA for the STP1 Area covers an approximately 130-acre investigation area with multiple structures and buildings. The focus of the SA is the STP1 Complex and associated structures, including the former Polishing Pond, former Sludge Disposal Area, and former Spray Field. The STP1 Complex is located in the KSC Industrial Area, at the southwest corner of 4<sup>th</sup> Street SE and C Avenue SE. The STP1 Complex is located approximately ¼-mile south and downgradient of the Fire Station #1 site (SWMU 116), which is also currently undergoing a PFAS SA because of potential releases of PFAS-containing aqueous film-forming foam (AFFF).

Previous PFAS investigations in the STP1 Area included a Center-Wide Phase I SWMU Assessment and Confirmatory Sampling (CS) project conducted in 2018 and 2019 and a Center-Wide Phase II/III SWMU Assessment and CS project, completed in 2022. These investigations identified STP1 as Location of Concern (LOC) 20 because releases associated with wastewater treatment plants (WWTPs) are a potential PFAS source to the environment. Phase I activities included groundwater and surface water sampling, which confirmed detections of PFAS at the site with exceedances of the applicable screening criteria at the time. The Phase I concluded with the recommendation of further CS to evaluate the extent of impacted groundwater and surface water, and assess potential surface soil and sediment impacts. Phase II/III results showed similar PFAS compounds in exceedance of applicable screening criteria in groundwater and surface

water, and PFAS were also identified in soil and sediment samples. The maximum PFAS concentration detected in groundwater during the Phase II/III was 4,520 nanograms per liter (ng/L) of perfluorooctanesulfonic acid (PFOS), in sample PFAS-DPT0187, located within the STP1 Complex. The Phase II/III also evaluated PFAS signatures using forensics analysis; detections in groundwater showed a modern AFFF signature and a legacy (long chain) AFFF with some WWTP influence signature in surface water. The Phase II/III recommended that STP1 advance to a Site Assessment, which is detailed in this SAPR.

During the SA, a total of seven soil, 131 groundwater direct push technology (DPT), 24 groundwater monitoring well, and 11 surface water samples were collected between April 2020 and March 2022. Monitoring well samples were analyzed for 18 PFAS compounds, with all other samples analyzed for 28 PFAS compounds using the Department of Defense Quality Systems Manual-compliant Method. The SA sample results were used along with historical results to evaluate the extent of PFAS impacts to the environment in the STP1 Area. Data generated to date and prior results were screened against the United States Environmental Protection Agency (USEPA) May 2022 Tap Water Regional Screening Levels (RSL) for groundwater and residential RSLs for soil (hazard quotient of 0.1). Surface water results were screened against the State of Florida Human Health Surface Water Screening Levels (SWSLs).

The seven soil samples were collected from one location, STP1-SB1000, where a continuous soil core was advanced to 70 feet below land surface (ft bls) to evaluate lithology. Soil samples were collected at depths within the saturated zone (9-10 ft bls, 21-22 ft bls, 29-30 ft bls, 43-44 ft bls, 45-46 ft bls, 49-50 ft bls and 53-54 ft bls) and were analyzed for PFAS and Total Organic Carbon (TOC). This location was chosen because it is co-located with a previous groundwater sample (PFAS-DPT0187) collected in January 2021 as part of the Phase II/III SWMU Assessment and CS, which had the maximum concentration of PFOS in groundwater at the time (4,520 ng/L) in the 23-27 ft bls interval. Out of the six PFAS compounds with applicable screening criteria, no PFAS compounds exceeded the RSLs in STP1-SB1000. There were low-level detections of PFOS in the upper three depth intervals to 30 ft bls, but none of them exceeded the RSL. TOC concentrations ranged across all samples from 880 to 18,000 milligrams per kilogram (mg/kg). The highest result was found at the shallowest interval, 9-10 ft bls, where

the lithology was recorded to be black, organic rich sand from 0-10 ft bls. Overall, TOC results were higher when evidence of organics were noted and lower when they were absent (which is to be expected). Compared to the PFAS detections found in soil, the higher TOC found in the shallower intervals corresponded to the intervals where PFAS were detected.

The 131 DPT groundwater samples were collected from various depth intervals, down to 44 ft bls, across 25 boring locations between October 2021 and March 2022. Of the six compounds with applicable screening criteria, five were detected at concentrations greater than the USEPA RSLs. There were no detections of hexafluoropropylene oxide dimer acid (HFPO-DA), commonly referred to as GenX. The locations with the highest detected concentrations were from STP1-DPT0010, located to the east of the STP1 Complex; STP1-DPT0015, located south of the former Polishing Pond; and SW3-DPT0132, located south of the former Sludge Disposal Area. The maximum detections for perfluoro-1-butananesulfonic acid (PFBS) (860 ng/L), perfluorohexanesulfonic acid (PFHxS) (4,600 ng/L), and PFOS (1,700 ng/L) were from the 8-12 ft bls interval at STP1-DPT0015. The maximum concentration of perfluoro-n-nonanoic acid (PFNA) (1,000 ng/L) was from the 8-12 ft bls interval at STP1-DPT0010. The maximum concentration of perfluoro-n-octanoic acid (PFOA) (19,000 ng/L) was from the 20-24 ft bls interval at SW3-DPT0132. Of the PFAS with RSLs, this PFOA detection was the overall maximum exceedance in groundwater during the SA. All STP1 DPT locations had an RSL exceedance except STP1-DPT0007 and STP1-DPT0016, which are located in the most eastern and western extents of the investigation area.

The monitoring wells sampled as part of the SA were all located in the southern portion of the site and had detections greater than RSLs for PFHxS, PFNA, PFOA, and PFOS. PFBS was also detected but not above the RSL, and there were no detections of HFPO-DA (GenX). The well with the overall maximum concentration of any PFAS was POL-MW0045S (screened 10 to 20 ft bls), with a PFOS concentration of 853.44 ng/L. This well is located just north of the former Polishing Pond.

The surface water locations (STP1-SW0001 through STP1-SW0011) sampled during the SA were located around the perimeter of the investigation area, with one sample, STP1-SW0011, co-located with the previously detected maximum concentration of PFOS (2,280 ng/L in PFAS-

SW057). Currently, there are Florida SWSLs for PFOA and PFOS. In the surface water samples collected during the SA, PFOA and PFOS were detected in all the samples. PFOA did not exceed the SWSL in any of the samples, but PFOS exceeded the SWSL of 10 ng/L in 10 of the 11 samples, with the maximum concentration of 1,200 ng/L in STP1-SW0011, located in the drainage ditch along the east side of the investigation area, on the east side of C Avenue SE.

A summary of samples collected during the SA are presented in the table below:

	<b>PFOA</b>	<b>PFOS</b>	<b>PFBS</b>	<b>PFHxS</b>	<b>PFNA</b>	<b>HFPO-DA (GenX)</b>
<b>(USEPA) Soil RSLs (µg/kg)</b>	<b>19</b>	<b>13</b>	<b>1,900</b>	<b>130</b>	<b>19</b>	<b>23</b>
Samples collected	7	7	7	7	7	7
No. of Detections	0	3	0	0	0	0
Results above RSL	0	0	0	0	0	0
<b>(USEPA) Groundwater RSLs (ng/L)</b>	<b>6</b>	<b>4</b>	<b>600</b>	<b>39</b>	<b>5.9</b>	<b>6</b>
Samples collected (DPT)	131	131	131	131	131	131
No. of Detections (DPT)	92	84	70	95	42	0
Results above RSL (DPT)	72	73	2	54	26	0
Samples collected (MW)	24	24	24	24	24	24
No. of Detections (MW)	23	17	24	24	6	0
Results above RSL (MW)	15	13	0	11	1	0
<b>(Florida) Surface Water SWSLs (ng/L)</b>	<b>500</b>	<b>10</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>
Samples collected	11	11	11	11	11	11
No. of Detections	11	11	11	11	10	0
Results above SWSL	0	10	NA	NA	NA	NA

NA = Not applicable; no screening criteria available

Results from the SA showed exceedances of the applicable screening criteria for groundwater and surface water. Considering the current and historical dataset, PFOS is the prevalent PFAS compound. Based on these results, additional groundwater DPT and surface water sampling should be considered for PFAS analysis, focused on evaluating surface water bodies in the southeast portion of the Industrial Area, which discharge into the Banana River. Additionally, installation of monitoring wells should be considered to evaluate the interaction between the groundwater and surface water at the site. Collection of additional samples for TOC analysis should also be considered from representative groundwater (saturated soils) and surface water locations to further evaluate potential correlations between PFAS and TOC to provide a more comprehensive dataset to assist in fate and transport analyses.



Results included in this report were presented to the KSC Remediation Team in October 2022.

An overall summary of samples collected to date in the STP1 Area with maximum concentrations is provided below:

	No. Samples Collected	PFOA	PFOS	PFBS	PFHxS	PFNA	HFPO-DA (GenX)
<b>Phase I/II/III (2018-2022)</b>		<b>Maximum Concentrations (with location)</b>					
Groundwater (ng/L)	48 (DPT) 1 (MW)	910 (PFAS-DPT0065-015.0)	4,520 (PFAS-DPT0187-025.0)	52.6 (PFAS-DPT0187-045.0)	1,200 (PFAS-DPT0064-010.0)	80 (PFAS-DPT0188-035.0)	NA
Soil (µg/kg)	18	1.4 (PFAS-SB0065-000.5)	70.6 (PFAS-SB0065-000.5)	0.78 (PFAS-SB0065-000.5)	37.8 (PFAS-SB0065-000.5)	0.95 (PFAS-SB0065-000.5)	NA
Surface Water (ng/L)	11	93.6 (PFAS-SW0057-000.5)	2,280 (PFAS-SW0057-000.5)	48.5 (PFAS-SW0052-000.5)	520 (PFAS-SW0057-000.5)	19 (PFAS-SW0057-000.5)	NA
Sediment (µg/kg)	9	ND	8.6 (PFAS-SD0026)	ND	ND	ND	NA
<b>Site Assessment (2021-2022)</b>		<b>Maximum Concentrations (with location)</b>					
Groundwater (ng/L)	131 (DPT) 24 (MW)	19,000 (SW3-DPT0132-022.0)	1,700 (STP1-DPT0015-010.0)	860 (STP1-DPT0015-010.0)	4,600 (STP1-DPT0015-010.0)	1,000 (STP1-DPT0010-010.0)	ND
Soil (µg/kg)	7	ND	1.9 (STP1-SB1000-009.5)	ND	ND	ND	ND
Surface Water (ng/L)	11	58 (STP1-SW0011)	1,200 (STP1-SW0011)	23 (STP1-SW0005)	340 (STP1-SW011)	20 (STP1-SW011)	ND

NA = Not applicable; not analyzed or no screening criteria

ND = Not detected

## **SECTION I**

### **INTRODUCTION**

#### **1.1 OVERVIEW**

This Per- and Polyfluoroalkyl Substances (PFAS) Site Assessment (SA) Progress Report (SAPR) discusses the investigation activities and findings for the Sewage Treatment Plant #1 (STP1) Area located at Kennedy Space Center (KSC), Florida (Figure 1-1). This site has been designated Solid Waste Management Unit (SWMU) 117 under KSC's Resource Conservation and Recovery Act (RCRA) Corrective Action Program, as the sewage treatment plant and associated areas were identified as a potential source of PFAS to the environment. This PFAS SAPR was prepared by Tetra Tech, Inc., for the National Aeronautics and Space Administration (NASA) under Indefinite Delivery Indefinite Quantity Contract 80KSC019D0011-80KSC019F0070. This is the first progress report to document on-going SA activities; supplemental progress reports will be provided as additional data is collected.

A Center-Wide Phase I SWMU Assessment and Confirmatory Sampling (CS) project conducted in 2018 and 2019 (NASA, 2019) under Potential Release Location (PRL) 237 identified STP1 and Former Sludge Disposal Area as Location of Concern (LOC) 20 because wastewater treatment plant (WWTP) effluent, sludge, and residuals are a potential PFAS source to the environment. STP1 operated between 1964 and 2001 to treat sewage from the KSC Industrial Area. A former Sludge Disposal Area, Polishing Pond, and Spray Field located to the south of the STP were formerly used to dispose of treated sewage. Currently it is being used as a lift station for the Cape Canaveral Space Force Station Regional Treatment Plant. The Phase I SWMU Assessment and CS activities included groundwater and surface water sampling, which confirmed detections of PFAS at the site with exceedances of applicable screening criteria at the time. The Phase I concluded with the recommendation of further sampling to evaluate the extent of impacted groundwater and surface water and assess potential impacts to soil and sediment.

A Center-Wide Phase II/III SWMU Assessment and CS project (NASA, 2022) was completed in 2022 where additional sampling was conducted at KSC, including the STP1 Area (LOC 20) to continue investigation into potential PFAS releases. Groundwater, soil, surface water, and

sediment samples were collected during the Phase II/III and results showed similar PFAS compounds were in exceedance of applicable screening criteria in groundwater and surface water, and PFAS were identified in soil and sediment samples. The Phase II/III evaluated PFAS signatures using forensics analysis, which indicated modern aqueous film-forming foam (AFFF) signatures in groundwater, and legacy (long chain) AFFF signatures with some WWTP influence signatures in surface water. There were several PFAS detected in groundwater at concentrations exceeding screening levels, including perfluorooctanesulfonic acid (PFOS), in excess of 1,000 nanograms per liter (ng/L). The conclusion of the Phase II/III recommended that STP1 advance to a SA, which is detailed in this SAPR. Previous PFAS investigations are further discussed in Section 2.4, with historical results presented in Appendix A.

## **1.2 PURPOSE**

The purpose of this progress report is to present the activities and results associated with the SA conducted in 2021-2022. The SA results along with the historical dataset is evaluated to provide recommendations and a path forward for further PFAS assessment at STP1.

## **1.3 REPORT ORGANIZATION**

The remainder of this PFAS SAPR is organized as follows:

*Section II: Site Description and Setting* – Provides description of the site, including an overview of previous and current site operations, site topography, geology, and hydrogeology, and a summary of previous investigations.

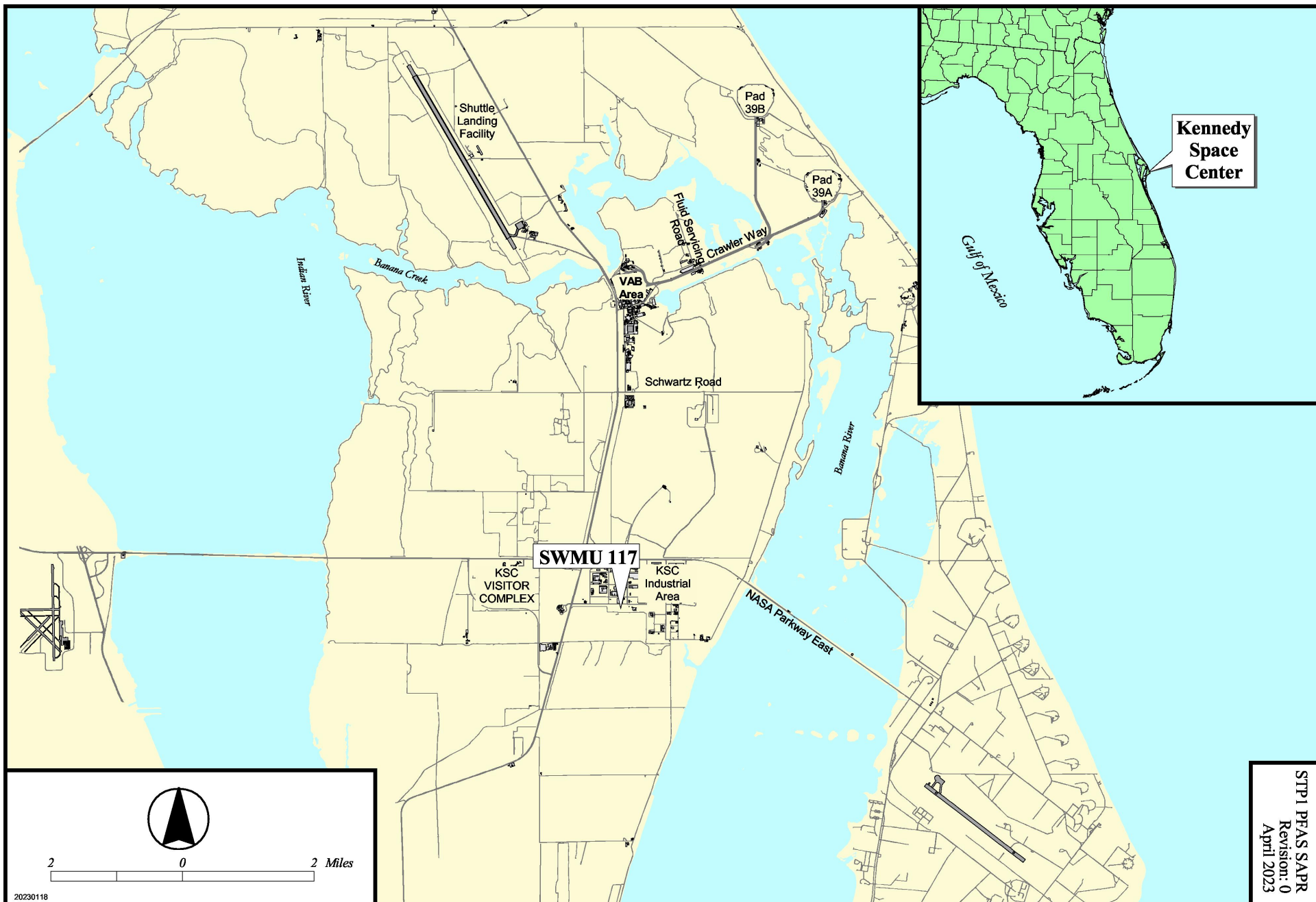
*Section III: PFAS Site Assessment Methodologies and Activities* – Presents the objectives, rationale, and methodologies used to accomplish the PFAS SA.

*Section IV: Data Evaluation* – Provides a summary of the screening process for soil, groundwater, and surface water samples collected during the PFAS SA.

*Section V: Conclusions and Recommendations* – Provides a summary of the PFAS SA results and recommendations for future investigations.

*Section VI: References* – Provides a listing of references cited in this report.

FIGURE 1-1 LOCATION OF KENNEDY SPACE CENTER AND SEWAGE TREATMENT PLANT #1 AREA  
SWMU 117, KENNEDY SPACE CENTER, FLORIDA



STP1 PEAS SAPR  
Revision: 0  
April 2023

## SECTION II

### SITE DESCRIPTION AND SETTING

#### 2.1 SITE LOCATION

The STP1 Area is located within KSC, on the East Coast of Florida in Brevard County (Figure 1-1). It is located on the southwestern corner of the intersection of 4<sup>th</sup> Street Southeast (SE) and C Avenue SE in the Industrial Area.

#### 2.2 SITE DESCRIPTION

##### 2.2.1 *Major Features*

The STP1 Area covers an approximately 130-acre investigation area with multiple structures and buildings, as shown on Figure 2-1. The focus of this SA is the STP1 Complex and associated structures, including the former Polishing Pond, former Sludge Disposal Area, and former Spray Field. STP1 is surrounded by concrete, asphalt, and gravel roadways and parking areas, with maintained grass areas surrounding the structures. The STP1 Complex is bounded by roads to the north, east, and south, and by the Paint and Oil Locker (POL) and Supply Warehouse #3 (SW3) remediation sites to the west. The POL and SW3 sites are currently being managed under SWMUs 067 and 088, respectively, for contamination associated with past chemical releases of chlorinated solvents. The former Polishing Pond, Sludge Disposal Area, and Spray Field are undeveloped areas located south of 5<sup>th</sup> Street SE. The former Polishing Pond is located within the SWMU 067 boundary. Unimproved roads, paths, and ditches are present throughout this area. The Fire Station #1 Area, located to the north and upgradient of the STP1 Complex along 3<sup>rd</sup> Street SE, has an ongoing PFAS assessment under SWMU 116 because of potential past releases of AFFF.

##### 2.2.2 *Topography and Surface Features*

Site topography around the improved areas of the STP1 Complex is relatively flat. Stormwater surface drainage flows away from the structures and infiltrates into surface soils and vegetated areas along the edges of the structures. There are drainage swales along the north, east, and west boundaries of the site, and a shallow ditch to the west along the fence line between the STP1

Complex and POL site. There are depressions in the topography and drainage ditches within the undeveloped portions of the study area (former Sludge Disposal Area, Polishing Pond, and Spray Field). The overall area has drainage swales primarily surrounding buildings and along roadways. This ditch system ultimately connects to the Gator Pond, the Region 1 Stormwater Basin, located approximately 0.60 miles to the southeast of the POL and SW3 sites.

## **2.3 GEOLOGY AND HYDROGEOLOGY**

### ***2.3.1 Regional Geology and Hydrogeology***

The regional geology and hydrogeology has been documented in the Phase I SWMU Assessment and CS Report for PRL 237 (NASA, 2019). As noted in the report, the surface and near-surface deposits of east-central Florida range from surficial unconsolidated sands to well indurated limestones and dolomites at depth. Four distinct geologic units are characteristic of east-central Florida and are believed to exist at KSC. In ascending order these are: (i) Eocene limestones; (ii) Lower and Middle Miocene compact silt and clays; (iii) Upper Miocene and Pliocene silty and clayey sands; and (iv) Pleistocene and Recent aged sands with interbedded shell layers.

### ***2.3.2 Local Geology and Hydrogeology***

As part of this PFAS SA, the geology for the STP1 Area was evaluated in December 2021 by collecting a soil core at STP1-SB1000, located along the east side of the STP. The continuous soil core was collected from 0 to 70 feet below land surface (ft bls) and recorded in a boring log provided in Appendix B. The groundwater table was encountered at approximately three ft bls. Soil samples were collected from six depths and submitted to a laboratory for analysis of PFAS and Total Organic Carbon (TOC) as further discussed in Sections 3.2.1 and Section 4.2. The lithology is described in Table 2-1 and summarized below.

The soil core evaluation indicted that the underlying lithology generally consists of primarily sand and shell down to approximately 44 ft bls and clays to 70 ft bls. The upper 22 feet consists of black and dark brown, fine-grained sand with organics. From approximately 22-44 ft bls, the lithology consists of gray fine-grained sand with shell fragments. At approximately 44 ft bls, a two-foot gray silty clay layer was encountered to 46 ft bls, then lithology transitioned to gray

clayey silty sands and sandy silt with shells to 66 ft bls. The final depth interval evaluated from 66-70 ft bls consisted of gray green clayey sandy silt with shells.

The hydrogeology in the STP1 Area is presumed based on available information at surrounding sites where groundwater is being managed under KSC's RCRA Permit. The POL site located to the west is designated SWMU 067, and monitoring wells related to that SWMU are located within the STP1 PFAS investigation area. Groundwater flow direction at the POL site is to the southeast in the shallow, intermediate, and deep zones. Based on this, groundwater flow in the STP1 Area is inferred to be generally southeast, as shown on Figure 2-2.

## **2.4 SUMMARY OF PREVIOUS INVESTIGATIONS**

### ***2.4.1 Previous RCRA Investigations***

A SWMU Assessment for STP1 PRL No. 150 was completed in 2006 (NASA, 2006). The SWMU Assessment gathered site information and ultimately identified two LOCs for further investigation because past operations may have impacted the environment. The LOCs comprised of a Former Sludge Revetment Area (LOC 1) and Electrical Transformer Location (LOC 2).

CS was conducted in 2007-2008 to investigate potential contamination associated with the identified LOCs. Soil samples were collected from LOC 1 for analysis of polychlorinated biphenyls (PCBs) to evaluate impacts from sludge disposal activities. Soil samples were collected from LOC 2 for analysis of PCBs and petroleum constituents to evaluate potential releases from the electrical transformer. The SWMU Assessment noted previous investigations of the Sludge Revetment Area in 1995 and 1997 that did not include analysis of PCBs. PCB results identified exceedances of the State of Florida Industrial Soil Cleanup Target Level (SCTL) of 2.6 milligrams per kilogram (mg/kg) at multiple locations, with the maximum detection of 11.84 mg/kg located near the transformer pad. PCBs were delineated to the Industrial SCTL of 2.6 mg/kg and an Interim Measure (IM) was implemented in 2009, which included excavation and disposal of approximately 1,144 tons of waste soils with concentrations in exceedance of the Industrial SCTL from both LOCs. Institutional land use controls remain in place and are being managed per the Land Use Control Implementation Plan (NASA, 2010).



The POL site (SWMU 067), located adjacent and to the west of the STP1 Complex, was developed between 1965 and 1972 and historically used for chemical storage, including solvents, adhesives, photographic and printing chemicals, detergents, insecticides, greases, oils, lubricants, and waxes (NASA, 2004). Investigation and cleanup efforts have been ongoing since SWMU Assessments were initiated in the 1990s and subsequent RCRA Facility Investigation (RFI) activities were performed between 1999 to 2002 to characterize the nature and extent of identified contaminants consisting of PCBs and petroleum constituents in soil, and chlorinated solvents, primarily trichloroethene (TCE) and daughter products, in groundwater (NASA, 2004). Between 2005 and 2013, groundwater contamination was addressed via in-situ chemical oxidation, enhanced bioremediation, and natural attenuation, as documented in reports and advance data packages (ADPs). Concurrent site characterization activities were conducted during this timeframe, and an Air Sparging (AS) IM was proposed in 2011 to treat TCE concentrations in groundwater greater than Florida Department of Environmental Protection (FDEP) Natural Attenuation Default Concentrations (NADCs) (NASA, 2017a). The AS IM was implemented in 2013 on the north side of 5<sup>th</sup> Street SE, which operated until 2020. A second AS IM was implemented on the south side of 5<sup>th</sup> Street SE in 2021, and is still operational. Continued refinement of the groundwater plume, AS IM Operation and Maintenance, and routine reporting are ongoing for the POL site. The POL solvent plume is being managed with the SW3 solvent plume (located just west) due to proximity.

#### ***2.4.2 Previous PFAS Investigations***

The previous PFAS investigations at STP1 are detailed in the Phase I SWMU Assessment and CS Report for PRL 237 (NASA, 2019) and the Phase II/III SWMU Assessment and CS Report for PRL 237 (NASA, 2022). These reports discuss the Center-wide PFAS investigations at KSC, under which STP1 was identified as LOC 20. These Phase I and Phase II/III reports, which represent the historical dataset, included groundwater, soil, surface water, and sediment samples collected at STP1. At the time of previous investigations, a list of 14 PFAS compounds were analyzed, and groundwater results were being compared to the Provisional Groundwater Cleanup Target Levels (pGCTL) developed for FDEP by the University of Florida in 2018. During Phase I, only groundwater and surface water were collected, and results were screened against the

pGCTLs, which were consistent with the 2016 United States Environmental Protection Agency (USEPA) Lifetime Drinking Water Health Advisory levels of 70 ng/L for perfluoro-n-octanoic acid (PFOA) and PFOS individually, and 70 ng/L for the sum of PFOA and PFOS (USEPA, 2016a and 2016b). In February 2021, FDEP published the PFAS Dynamic Plan (updated in March 2022 [FDEP, 2022]), which included provisional screening levels for PFOA and PFOS in groundwater, irrigation water, surface water, and soil. There were no applicable screening levels for sediment. The groundwater, surface water, and soil samples collected during the Phase II/III were also analyzed for a list of 14 PFAS compounds and compared to these provisional screening levels in the Dynamic Plan.

After the Phase I and Phase II/III investigations, in May 2022, the USEPA issued updated Tap Water Regional Screening Levels (RSLs) for PFOA, PFOS, and perfluoro-1-butanesulfonic acid (PFBS), and included RSLs for additional PFAS compounds including perfluorohexanesulfonic acid (PFHxS), perfluoro-n-nonanoic acid (PFNA), and hexafluoropropylene oxide dimer acid (HFPO-DA), commonly referred to as GenX. In November 2022, the USEPA RSL tables were updated, but there were no changes to the PFAS screening levels.

Historical results for each media are included in Tables A-1 through A-5 in Appendix A. Historical PFAS sample locations are presented on Figure 2-3. The historical dataset included in Appendix A has been re-screened and compared to the November 2022 USEPA RSLs for groundwater and soil (with Hazard Quotient [HQ] of 0.1). These results were re-screened against the updated criteria because these are being used as project screening levels for this SA, as further discussed in Section 4.1. The tables in Appendix A are organized to present the PFAS with applicable screening criteria at the top of the tables. The following summary refers to the historical results compared to the updated screening levels.

During the Phase I in 2018-2019, 16 direct push technology (DPT) groundwater samples were collected from four locations (PFAS-DPT0064, PFAS-DPT0065, PFAS-DPT0143, and PFAS-DPT0144) and one surface water sample (PFAS-SW0010) was also collected to evaluate the potential PFAS impacts associated with STP1. In addition, eight DPT groundwater samples were collected from two locations (PFAS-DPT0061 and PFAS-DPT0062) east of LOC 20, and 12 DPT samples were collected from three locations (PFAS-DPT0059, PFAS-DPT0060, and PFAS-

DPT0124) to evaluate potential impacts to the surrounding stormwater pond and Center-wide groundwater.

A re-screening of the historical DPT groundwater results collected during the Phase I showed four PFAS compounds (PFHxS, PFNA, PFOA, and PFOS) greater than RSLs. HFPO-DA was not included in the PFAS analytical suite at the time, and PFBS concentrations were less than RSLs. The location with the maximum concentration of PFHxS was at PFAS-DPT0064 in the 8-12 ft bls interval; the location with the maximum concentration of PFNA was at PFAS-DPT0065 in the 13-17 ft bls interval; the location with the maximum concentration of PFOA was at PFAS-DPT0065 in the 13-17 ft bls interval; the location with the maximum concentration of PFOS was at PFAS-DPT0064 in the 23-27 ft bls interval. The highest detected concentration overall was PFHxS at 1,200 ng/L in the 8-12 interval at PFAS-DPT0064. Because the Phase I was only screening PFOA and PFOS to the pGCTLs, the report noted a maximum concentration of PFOA at 910 ng/L in PFAS-DPT0065 (and previously reported as 1,330 ng/L for the sum of PFOA and PFOS). This DPT location is from the former Sludge Disposal Area. The other location with the highest detections was PFAS-DPT0064, which had higher concentrations of PFOS, but lower concentrations of PFOA than PFAS-DPT0065. This DPT location is just south of the former Polishing Pond. The surface water sample, PFAS-SW0010 located just west of PFAS-DPT0064, had a concentration of PFOA (65 ng/L) less than the surface water screening level (SWSL) of 500 ng/L and a concentration of PFOS (520 ng/L) greater than the SWSL of 10 ng/L, which suggested a potential groundwater to surface water interaction. The Phase I report recommended further assessment to determine the extent of impacted groundwater and surface water, and potential impacts to soil and sediment from STP operations, effluent disposal, and sludge disposal at LOC 20.

During the Phase II/III in 2020-2021, soil, groundwater, surface water, and sediment samples were collected to continue to evaluate potential impacts of PFAS in the STP1 Area. In September 2020, a total of six surface water samples (PFAS-SW0053 through PFAS-SW0058) and seven sediment samples (PFAS-SD0022 through PFAS-SD0027 and PFAS-SD0037) were collected within the LOC. In January 2021, two surface water samples (PFAS-SW0051 and PFAS-SW0052), two sediment samples (PFAS-SD0020 and PFAS-SD0021), 12 groundwater samples

from three DPT points (PFAS-DPT0187 through PFAS-DPT0189), and 18 soil samples from nine soil borings (PFAS-SB0061 through PFAS-SB0069) were collected. In addition, two surface water samples (PFAS-SW0133 and S014-SW0001) were collected to evaluate site-wide surface water in the area. An existing monitoring well, CM\_S-MW0039, was sampled in June 2021 to evaluate site-wide groundwater in the area. The well is located approximately ¼-mile to the west of the STP1 Complex, along 4<sup>th</sup> Street SE. The well sample was analyzed for the same list of 14 PFAS compounds as the rest of the samples collected during the Phase II/III, but included four additional PFAS compounds (including HFPO-DA).

A re-screening of the Phase II/III soil results revealed PFOS greater than the RSL of 13 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ) at one location (PFAS-SB0065), located in the former Polishing Pond. The 0-0.5 and 0.5-2 ft bls results were 70.6  $\mu\text{g}/\text{kg}$  and 27.4  $\mu\text{g}/\text{kg}$ , respectively, in this boring location. Nearly all the other soil samples had detections of PFOS, but at concentrations less than the RSL. No other soil samples had RSL exceedances.

A re-screening of the Phase II/III DPT groundwater results showed four PFAS compounds (PFHxS, PFNA, PFOA, and PFOS) in exceedance of the RSLs. The highest concentrations for these compounds were detected at PFAS-DPT0187, which is located within the STP1 Complex. The maximum concentrations were detected in the 23-27 ft bls depth interval, with results of 505 ng/L for PFHxS, 46.4 ng/L for PFNA, 165 ng/L for PFOA, and 4,520 ng/L for PFOS. DPT0188, located southeast of the STP1 Complex and northeast of the former Polishing Pond, also had exceedances of the same four PFAS compounds. PFAS-DPT0189, located west of the former Sludge Disposal Area, had one depth interval with a slight exceedance of PFOS. The monitoring well results from CM\_S-MW0039 revealed low-level concentrations of PFBS, PFHxS, PFOA, and PFOS less than RSLs. The non-detect value for HFPO-DA (GenX) was elevated to a concentration slightly greater than the RSL.

The surface water samples collected during the Phase II/III all had detections of PFOS greater than the SWSL of 10 ng/L. The highest concentration was 2,280 ng/L in PFAS-SW0057, located in the drainage ditch to the east of the STP1 Complex, along the east side of C Avenue SE. Sediment sample PFAS-SD0026, co-located with PFAS-SW0057, had the highest detection of PFAS of the nine sediment samples collected during the Phase II/III. In this sediment sample,

PFOS was 8.6 µg/kg, and PFHxS was 0.36 µg/kg, representing the only other PFAS compound detected in any of the sediment samples collected. Six other sediment locations had detections of PFOS, indicating a potential correlation between surface water and sediment PFAS impacts.

The Phase II/III conceptual site model included forensic analysis of groundwater and surface water data to identify common PFAS mixture signatures. The investigation concluded that PFAS detections in groundwater showed a modern AFFF signature and a legacy (long chain) AFFF with some WWTP influence signature in surface water. Surface water in the area primarily discharges to the Region 1 Stormwater Pond (Gator Pond) and groundwater flow direction is generally southeast. The stratigraphy at the site indicates a prevalence of muddy swales and deep groundwater impacts (43 ft bls depth interval) were identified. The conclusion of the Phase II/III included recommendation that STP1 advance to Site Assessment.

**Table 2-1. Lithology Description**

Location	Depth (ft bls)	Description
STP1-SB1000	0 - 10 <sup>1,2</sup>	Dark brown to black organic rich fine sands with traces of silt
	10 - 22 <sup>1,2</sup>	Same as above with less black/organic sands; transitions to gray
	22 - 30 <sup>1,2</sup>	Gray loose fine sands with minor shells (up to ~20%)
	30 - 44 <sup>1,2</sup>	Gray sands with crushed shells (> 50%), with trace silts
	44 - 46 <sup>1</sup>	Gray dense plastic clay
	46 - 50 <sup>1</sup>	Gray clayey silty sand/sandy silt with shell
	50 - 54 <sup>1</sup>	Gray silty clay
	54 - 66	Gray shells and sand with traces of clay
	66 - 70	Gray green clayey sandy silt with shells

ft bls = feet below land surface

(1) Soil sample collected within depth interval

(2) Groundwater DPT sample collected within depth interval



FIGURE 2-1 SITE LAYOUT  
SWMU 117, KENNEDY SPACE CENTER, FLORIDA

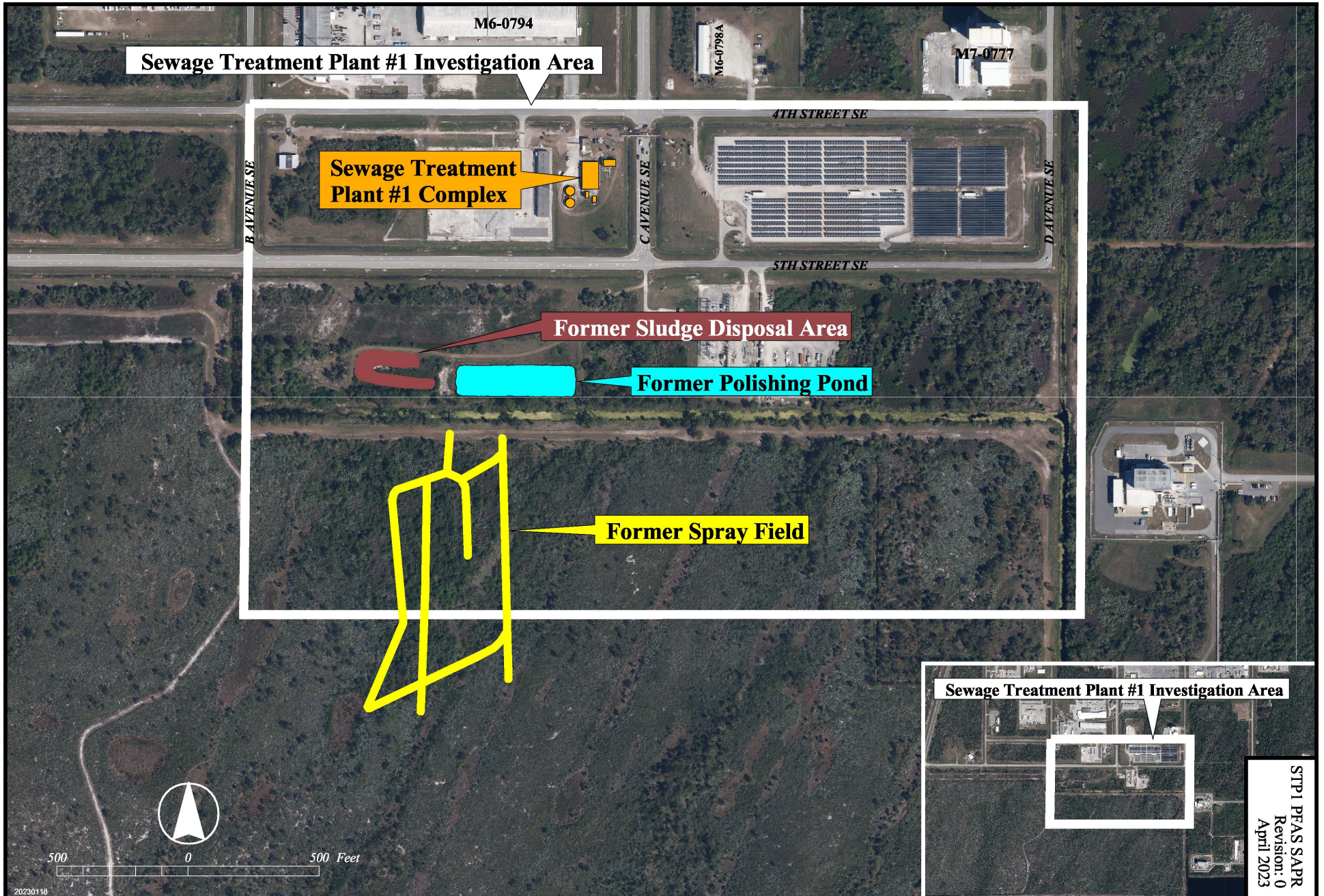




FIGURE 2-2 GROUNDWATER FLOW DIRECTION  
SWMU 117, KENNEDY SPACE CENTER, FLORIDA

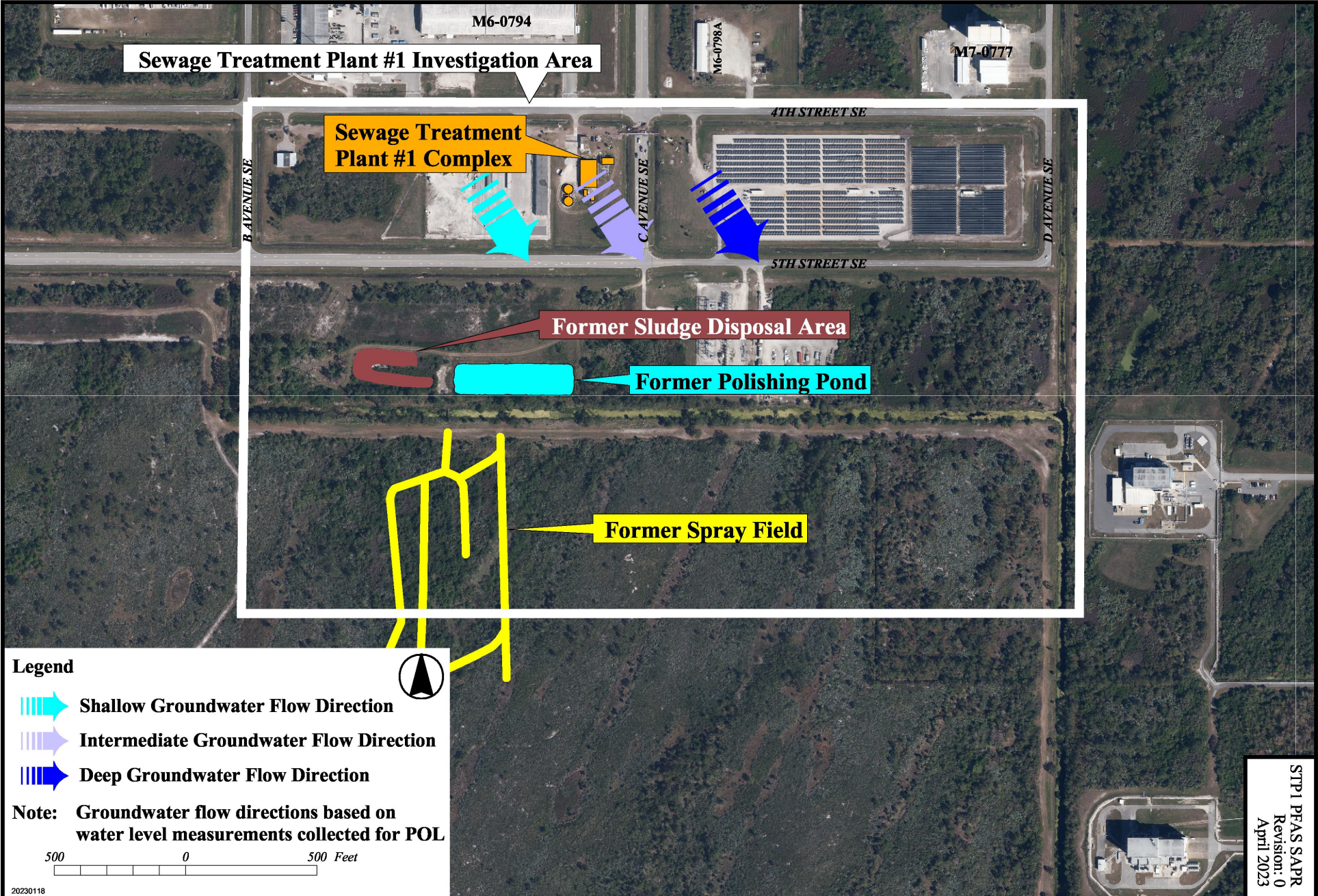
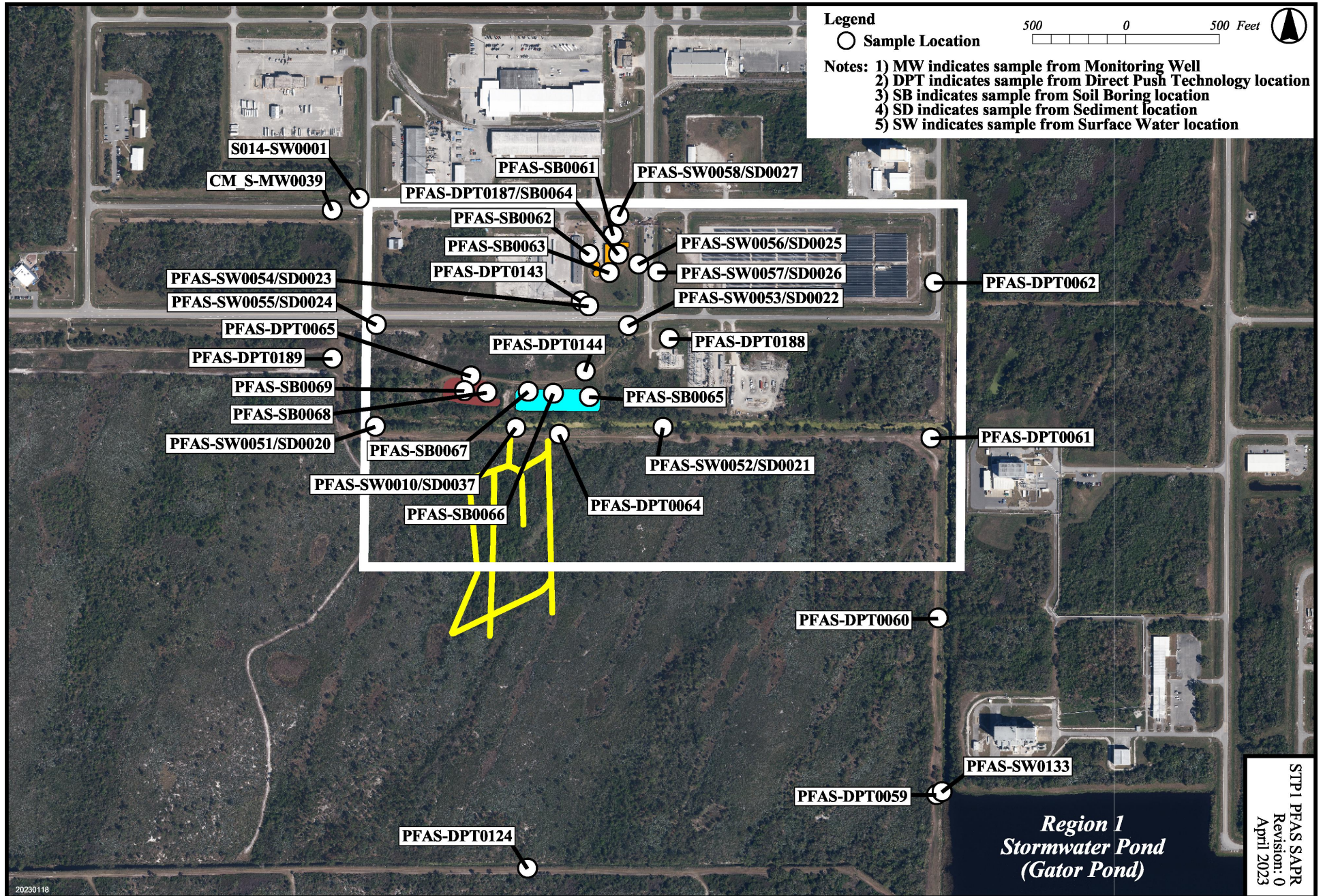




FIGURE 2-3 HISTORICAL PFAS SAMPLE LOCATIONS  
SWMU 117, KENNEDY SPACE CENTER, FLORIDA





## **SECTION III**

### **PFAS SITE ASSESSMENT METHODOLOGIES AND ACTIVITIES**

Based on findings from the Center-wide PFAS Phase I, II and III SWMU Assessments and CS (NASA, 2019 and NASA, 2022), additional sampling was conducted in the STP1 Area between April 2020 and March 2022 to supplement the existing dataset and further characterize PFAS impacts to the environment. PFAS sampling locations are shown on Figure 3-1. Activities conducted during the STP1 PFAS SA included:

- Collection of a continuous soil core to 70 ft bls to evaluate lithology, with collection of grab samples from seven depth intervals for PFAS and TOC analysis in support of site characterization;
- Collection of DPT groundwater samples at various depth intervals from 25 boring locations (total of 131 DPT samples) for PFAS analysis;
- Collection of 24 groundwater samples from 22 existing monitoring wells for PFAS analysis (two wells were sampled on two different dates); and
- Collection of 11 surface water samples for PFAS analysis.

Note, some groundwater samples from monitoring wells and DPT points were also analyzed for volatile organic compounds (VOCs). These results are reported with POL-SW3 site monitoring documentation.

#### **3.1 PFAS SAMPLING PROTOCOL**

PFAS are present in many consumer products (including some typical sampling equipment) and are widely present in the environment. Therefore, special precautions were followed to avoid compromising sampling integrity during collection. Field sampling methodologies were conducted in accordance with applicable portions of the KSC Sampling and Analysis Plan (NASA, 2017b), FDEP Standard Operating Procedures (SOPs) for groundwater, surface water, and soil (FDEP, 2017), and applicable portions of the FDEP draft PFAS Sampling SOP (FDEP, 2019). A corporate specific PFAS Sampling SOP was also followed and is included with the field

documentation in Appendix B. Field quality assurance/quality control (QA/QC) samples were also collected to evaluate potential PFAS cross-contamination in site samples, as further discussed in Section 3.5.

## **3.2 PFAS SITE ASSESSMENT SAMPLING ACTIVITIES**

The following sections discuss the PFAS sampling activities conducted during the SA.

### ***3.2.1 Soil Sampling***

On December 9, 2021, a continuous soil core (STP1-SB1000) was advanced to 70 ft bls using a Geoprobe 8140LS Sonic drill rig to evaluate the site's lithology and determine the best placement for DPT groundwater sample intervals. The soil core was co-located with a soil boring location (PFAS-SB0064) and DPT location (PFAS-DPT0187) previously collected in January 2021 as part of the Phase II/III. This location was chosen for evaluation because it had the maximum concentration of PFOS in groundwater (4,520 ng/L) in the 23-27 ft bls interval, and is located alongside (east of) the STP1 Complex.

Lithologic descriptions were recorded, as described in Section 2.3.2, and grab samples were collected from the soil core at seven discrete 1-foot depth intervals (9-10 ft bls, 21-22 ft bls, 29-30 ft bls, 43-44 ft bls, 45-46 ft bls, 49-50 ft bls, and 53-54 ft bls) for laboratory analysis of PFAS and TOC. Soil sampling location and rationale are presented in Table 3-1 and shown on Figure 3-1. The soil boring log for STP1-SB1000 is included in Appendix B. Note, the soil boring log denotes the sample as "STP1-SB0001", which was later renamed to "STP1-SB1000".

### ***3.2.2 DPT Groundwater Sampling***

In October and November 2021, DPT groundwater samples were collected from seven locations in the POL area and former Sludge Disposal Area (POL-DPT1467, POL-DPT1469, POL-DPT1474 through POL-DPT1476, SW3-DPT0131, and SW3-DPT0132) at four depth intervals (10-14 ft bls, 20-24 ft bls, 30-34 ft bls, and 40-44 ft bls), for a total of 28 DPT groundwater samples. In February and March 2022, DPT groundwater samples were collected from 18 locations (STP1-DPT0001 through STP1-DPT0018) at five or six depth intervals depending on the depth of groundwater (3-7 ft bls, 8-12 ft bls, 14-18 ft bls, 21-25 ft bls, 31-35 ft bls, and 40-44

ft bls), for a total of 103 samples. At some locations, the shallowest (3-7 ft bls) interval was unable to be collected because the water table was not present at that depth. The DPT sample locations were selected in areas around the site to provide additional spatial coverage in relation to historical groundwater samples collected during the Phase I and Phase II/III events. The four-foot screen intervals were selected based on the lithology observed in the continuous soil core collected from STP1-SB1000 in December 2021, which was primarily organic rich sands with traces of silt in the upper 22 feet, transitioning to loose fine sands with shells, with the deepest screen interval placed at 40-44 ft bls directly above a dense clay layer. The detections of PFOS in soil samples the upper three soil sample depth intervals (9-10 ft bls, 21-22 ft bls, and 29-30 ft bls) were also considered for screen interval placement. DPT groundwater sampling locations and rationale are presented in Table 3-2 and shown on Figure 3-1. DPT groundwater depth intervals are also shown with the lithology descriptions for reference in Table 3-1.

At each DPT groundwater sample location, the upper 5 feet of soil was excavated using a stainless-steel hand auger to verify the absence of underground utilities. Groundwater grab samples were collected by DPT methods via a 4-foot-long stainless-steel retractable screen. New high-density polyethylene (HDPE) tubing was used for each sampling location. When the desired sampling depth was reached, the tubing was placed into the borehole through the sampling rods at mid-screen, and the groundwater was purged with a peristaltic pump for a minimum of five screen volumes (approximately 1.5 liters) prior to sample collection. During sample purge, observations including odor and color were recorded prior to collecting each sample. Upon completion, each sample borehole was abandoned via pressure grouting techniques. DPT groundwater samples were placed in laboratory-provided sample containers, sealed, labeled, packed on ice, and delivered under proper chain-of-custody protocol to the laboratory. DPT groundwater sample logs are provided in Appendix B.

### ***3.2.3 Monitoring Well Groundwater Sampling***

In April 2020, following the Phase I SWMU Assessment and CS, 22 existing monitoring wells located in the area of the former Polishing Pond, Sludge Disposal Area, and Spray Field were sampled (POL-MW0008S, POL-MW0008I, POL-MW0011S, POL-MW0011I, POL-MW0036SI, POL-MW0036I, POL-MW0041SI, POL-MW0043S, POL-MW0043I, POL-MW0043D, POL-

MW0044I, POL-MW0044D, POL-MW0045S, POL-MW0045I, POL-MW0045D, POL-MW0046D, POL-MW0046DD, POL-MW0047I, POL-MW0047D, POL-MW0047DD, SW3-MW0027, and SW3-MW0028) to evaluate PFAS in this area. The wells ranged in depth, with screen intervals between 8.6-10 ft bls to 40-50 ft bls. Two of the wells, POL-MW0011S and POL-MW0011I were sampled again in August 2021. Monitoring well locations and rationale are presented in Table 3-3 and shown on Figure 3-1.

New HDPE tubing was used for each sample location. The monitoring wells were sampled using a peristaltic pump and flow through cell utilizing a low-flow purge technique. Water quality parameters were recorded at each location. Monitoring well samples were placed in laboratory-provided sample containers, sealed, labeled, packed on ice, and delivered under proper chain-of-custody protocol to the laboratory. Monitoring well sampling logs are provided in Appendix B.

#### ***3.2.4 Surface Water Sampling***

In March 2022, 11 surface water samples were collected from drainage swales located throughout and near the STP1 investigation area (STP1-SW0001 through STP1-SW0011). A grab sample was collected from the mid-point of the standing water location using a pre-cleaned pole-mounted scoop. Prior to sample collection, water quality parameters were collected using a peristaltic pump equipped with a flow-through cell through HDPE tubing attached to a sample collection pole. Surface water locations and rationale are presented in Table 3-4 and on Figure 3-1. Surface water sample logs are provided in Appendix B.

### **3.3 PFAS LABORATORY ANALYSIS**

Groundwater samples collected from monitoring wells in April 2020 and August 2021 were shipped under chain-of-custody to Battelle in Norwell, Massachusetts. All other collected soil, groundwater, and surface water samples were shipped under chain-of-custody to Pace Laboratories in West Columbia, South Carolina, a National Environmental Laboratory Accreditation Program-certified laboratory. The PFAS samples were analyzed by Liquid Chromatography Tandem Mass Spectrometry (LC/MS/MS) Compliant with Table B-15 of the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) version 5.3. A list of 28 PFAS analytes were reported for the DPT groundwater, soil, and surface water samples. A list of

18 PFAS analytes were reported for the monitoring well groundwater samples, which at the time of sample collection, was an expanded list from the 14 analytes reported during the SA/CS phases. The soil samples collected from the soil core were also analyzed for TOC by the Walkley-Black Method. Note the analytical method used for this SA included a more robust list of PFAS compounds than the method utilized during the prior investigations.

### **3.4 INVESTIGATION DERIVED WASTE**

Investigation-derived waste (IDW) generated during the SA included soil cuttings, sampling purge water, and decontamination fluids. The soil core was evaluated, samples were collected for PFAS analysis, and the soil cuttings were determined to be non-hazardous per NASA's PFAS IDW disposal memorandum (NASA, 2021). The aqueous IDW was containerized in totes, characterized, and determined to be non-hazardous prior to being transferred to KSC's on-site IDW treatment system, per NASA's PFAS IDW disposal memorandum. Miscellaneous trash, construction debris, and personal protective equipment generated during field activities was wiped clean and disposed of in an appropriate trash container.

### **3.5 FIELD DATA QUALITY**

QA/QC samples were collected for PFAS analysis throughout the duration of the SA and included field blanks at a frequency of one per day, equipment blanks at a frequency of one per reusable equipment type, sample duplicates at a ratio of approximately one per 10 samples, and matrix spikes at a ratio of approximately one per 20 samples. The QA/QC samples were collected in accordance with FDEP SOP FQ 1000 (Field Quality Control Requirements) (FDEP, 2017). The field blanks were collected by transferring laboratory-provided PFAS-free water into proper laboratory provided containers. The equipment blanks were collected from sampling equipment such as HDPE tubing and decontaminated stainless-steel Geoprobe sampler screens. Analytical results for the field QC samples are presented in Section IV.

**Table 3-1. Soil Sample and Rationale**

Location	Soil Sample Identification	Soil Sample Depth (ft bls)	Soil Sampling Rationale	Corresponding DPT Groundwater Screen Interval (ft bls)	Corresponding Lithologic Description
STP1-SB1000	STP1SB1000-009.5-20211209	9 - 10	Soil core to determine lithology and best placement of groundwater sample screen intervals	3 - 7, 8 - 12, 14 - 18	Dark brown to Black organic rich sands, transitioning to brown and gray sands with traces of shells
	STP1SB1000-021.5-20211209	21 - 22		21 - 25	Gray sand with shells (up to 20%)
	STP1SB1000-029.5-20211209	29 - 30		31 - 35	Gray sand with crushed shells (< 50%); dense clay layer encountered at 44 feet
	STP1SB1000-043.5-20211209	43 - 44		40 - 44	
	STP1SB1000-045.5-20211209	45 - 46		NA	Gray dense plastic clay
	STP1SB1000-049.5-20211209	49 - 50		NA	Gray clayey silty sand/sandy silt with shells
	STP1SB1000-053.5-20211209	53 - 54		NA	Gray silty clay

Samples analyzed for 28 PFAS compounds by LC/MS/MS Compliant with QSM 5.3 Table B-15.

Samples were also analyzed for Total Organic Carbon (TOC)

ft bls = feet below land surface

PFAS = per- and polyfluoroalkyl substances.

NA = Not applicable, sample not collected

**Table 3-2. DPT Sample Locations and Rationale**

Location (STP1-)	Date	Sample Depth (ft bls)	Sampling Rationale
POL-DPT1467	10/21/2021	10 - 14	Location east of the former polishing pond
		20 - 24	
		30 - 34	
		40 - 44	
POL-DPT1469	10/22/2021	10 - 14	Location along the south side of the drainage ditch south of the former polishing pond
		20 - 24	
		30 - 34	
		40 - 44	
POL-DPT1474	10/26/2021	10 - 14	Location east of the former polishing pond
		20 - 24	
		30 - 34	
		40 - 44	
POL-DPT1475	10/26/2021	10 - 14	Location south of the STP1 Complex
		20 - 24	
		30 - 34	
		40 - 44	
POL-DPT1476	10/28/2021	10 - 14	Location northeast of the former polishing pond
		20 - 24	
		30 - 34	
		40 - 44	
SW3-DPT0131	11/2/2021	10 - 14	Within the former sludge disposal area
		20 - 24	
		30 - 34	
		40 - 44	
SW3-DPT0132	11/2/2021	10 - 14	South of the former sludge disposal area
		20 - 24	
		30 - 34	
		40 - 44	
STP1-DPT0001	2/17/2022	3 - 7	Northern delineation location, north of the STP1 Complex
		8 - 12	
		14 - 18	
		21 - 25	
		31 - 35	
		40 - 44	
STP1-DPT0002	2/17/2022	3 - 7	Southwest corner of the STP1 Complex
		8 - 12	
		14 - 18	
		21 - 25	
		31 - 35	
		40 - 44	
STP1-DPT0003	2/21/2022	8 - 12	Evaluate potential PFAS impacts from former Spray Field operations
		14 - 18	
		21 - 25	
		31 - 35	
		40 - 44	
STP1-DPT0004	2/21/2022	8 - 12	Evaluate potential PFAS impacts from former Spray Field operations
		14 - 18	
		21 - 25	
		31 - 35	
		40 - 44	



**Table 3-2. DPT Sample Locations and Rationale (Continued)**

Location (STP1-)	Date	Sample Depth (ft bls)	Sampling Rationale
STP1-DPT0005	2/22/2022	8 - 12	Location in southeastern portion of the investigation area
		14 - 18	
		21 - 25	
		31 - 35	
		40 - 44	
STP1-DPT0006	2/22/2022	8 - 12	Location in southeastern portion of the investigation area
		14 - 18	
		21 - 25	
		31 - 35	
		40 - 44	
STP1-DPT0007	2/22/2022	3 - 7	Western boundary of the investigation area
		8 - 12	
		14 - 18	
		21 - 25	
		31 - 35	
STP1-DPT0008	2/23/2022	3 - 7	Location between DPTs PFAS-DPT0188 and PFAS-DPT0062
		8 - 12	
		14 - 18	
		21 - 25	
		31 - 35	
STP1-DPT0009	2/23/2022	3 - 7	Location east of the STP1 Complex
		8 - 12	
		14 - 18	
		21 - 25	
		31 - 35	
STP1-DPT0010	2/23/2022	3 - 7	Northern boundary of the investigation area
		8 - 12	
		14 - 18	
		21 - 25	
		31 - 35	
STP1-DPT0011	2/23/2022	3 - 7	Location west of the STP1 Complex; horizontal delineation of previous sample PFAS-DPT0187
		8 - 12	
		14 - 18	
		21 - 25	
		31 - 35	
STP1-DPT0012	2/24/2022	3 - 7	Northwestern delineation location
		8 - 12	
		14 - 18	
		21 - 25	
		31 - 35	
STP1-DPT0013	2/24/2022	3 - 7	Northwest of previous sample PFAS-DPT0065
		8 - 12	
		14 - 18	
		21 - 25	
		31 - 35	
STP1-DPT0013	2/24/2022	40 - 44	Northwest of previous sample PFAS-DPT0065
		3 - 7	
		8 - 12	
		14 - 18	
		21 - 25	

**Table 3-2. DPT Sample Locations and Rationale (Continued)**

Location (STP1-)	Date	Sample Depth (ft bls)	Sampling Rationale
STP1-DPT0014	2/25/2022	3 - 7	Location between previous samples PFAS-DPT0065 and PFAS-DPT0189
		8 - 12	
		14 - 18	
		21 - 25	
		31 - 35	
STP1-DPT0015	2/25/2022	40 - 44	Location along south side of former polishing pond
		8 - 12	
		14 - 18	
		21 - 25	
		31 - 35	
STP1-DPT0016	3/14/2022	40 - 44	East boundary of the investigation area; west delineation point for previous sample PFAS-DPT0062
		3 - 7	
		8 - 12	
		14 - 18	
		21 - 25	
STP1-DPT0017	3/15/2022	31 - 35	Northeast boundary of the investigation area; north delineation point for previous sample PFAS-DPT0062
		40 - 44	
		3 - 7	
		8 - 12	
		14 - 18	
STP1-DPT0018	3/15/2022	21 - 25	South delineation point for previous sample PFAS-DPT0062
		31 - 35	
		40 - 44	
		3 - 7	
		8 - 12	

Samples analyzed for 28 PFAS compounds by LC/MS/MS Compliant with QSM 5.3 Table B-15

ft bls = feet below land surface

PFAS = per- and polyfluoroalkyl substances

**Table 3-3. Monitoring Well Sample Locations and Rationale**

<b>Well ID</b>	<b>Screen Interval (ft bls)</b>	<b>Sampling Rationale</b>
POL-MW0008S	5 - 10	Location south of the STP1 Complex
POL-MW0008I	25 - 30	
POL-MW0011S	25 - 30	Location north of the former Polishing Pond
POL-MW0011I	25 - 30	
POL-MW0036SI	18 - 23	North of former Polishing Pond
POL-MW0036I	25 - 30	
POL-MW0041SI	18 - 23	North of former Polishing Pond
POL-MW0043S	10 - 20	North of former Polishing Pond
POL-MW0043I	20 - 30	
POL-MW0043D	30 - 40	
POL-MW0044I	20 - 30	North of former Polishing Pond
POL-MW0044D	30 - 40	
POL-MW0045S	10 - 20	North of former Polishing Pond
POL-MW0045I	20 - 30	
POL-MW0045D	30 - 40	
POL-MW0046D	30 - 40	Location east of the former Polishing Pond
POL-MW0046DD	40 - 50	

**Table 3-3. Monitoring Well Sample Locations and Rationale (Continued)**

Well ID	Screen Interval (ft bls)	Sampling Rationale
POL- MW0047I	20 - 30	Location east of the former Polishing Pond
POL- MW0047D	30 - 40	
POL- MW0047DD	40 - 50	
SW3- MW0027	27 - 37	Northwest of the former Polishing Pond
SW3- MW0028	27 - 37	Northwest of the former Polishing Pond

Samples analyzed for 28 PFAS compounds by LC/MS/MS Compliant with QSM 5.3 Table B-15

ft bls = feet below land surface

PFAS = per- and polyfluoroalkyl substances

**Table 3-4. Surface Water Sample Locations and Rationale**

<b>Location (STP1-)</b>	<b>Sample Depth (ft bls)</b>	<b>Sampling Rationale</b>
SW0001	0 - 0.5	South of former Sludge Disposal Area
SW0002	0 - 0.5	Upstream (northwest) of former Sludge Disposal Area and Polishing Pond
SW0003	0 - 0.5	South of former Polishing Pond
SW0004	0 - 0.5	Downstream of former Sludge Disposal Area and Polishing Pond in former Spray Field
SW0005	0 - 0.5	Upstream of ditch intersection to Gator Pond
SW0006	0 - 0.5	Upstream of ditch intersection to Gator Pond
SW0007	0 - 0.5	Downstream of ditch merge point to Gator Pond
SW0008	0 - 0.5	Upstream of ditch intersection to Gator Pond
SW0009	0 - 0.5	Downstream of former groundwater sample PFAS-DPT0062
SW0010	0 - 0.5	Upstream of former groundwater sample PFAS-DPT0062
SW0011	0 - 0.5	Co-located with former surface water/sediment samples PFAS-SW0057/PFAS-SD0026

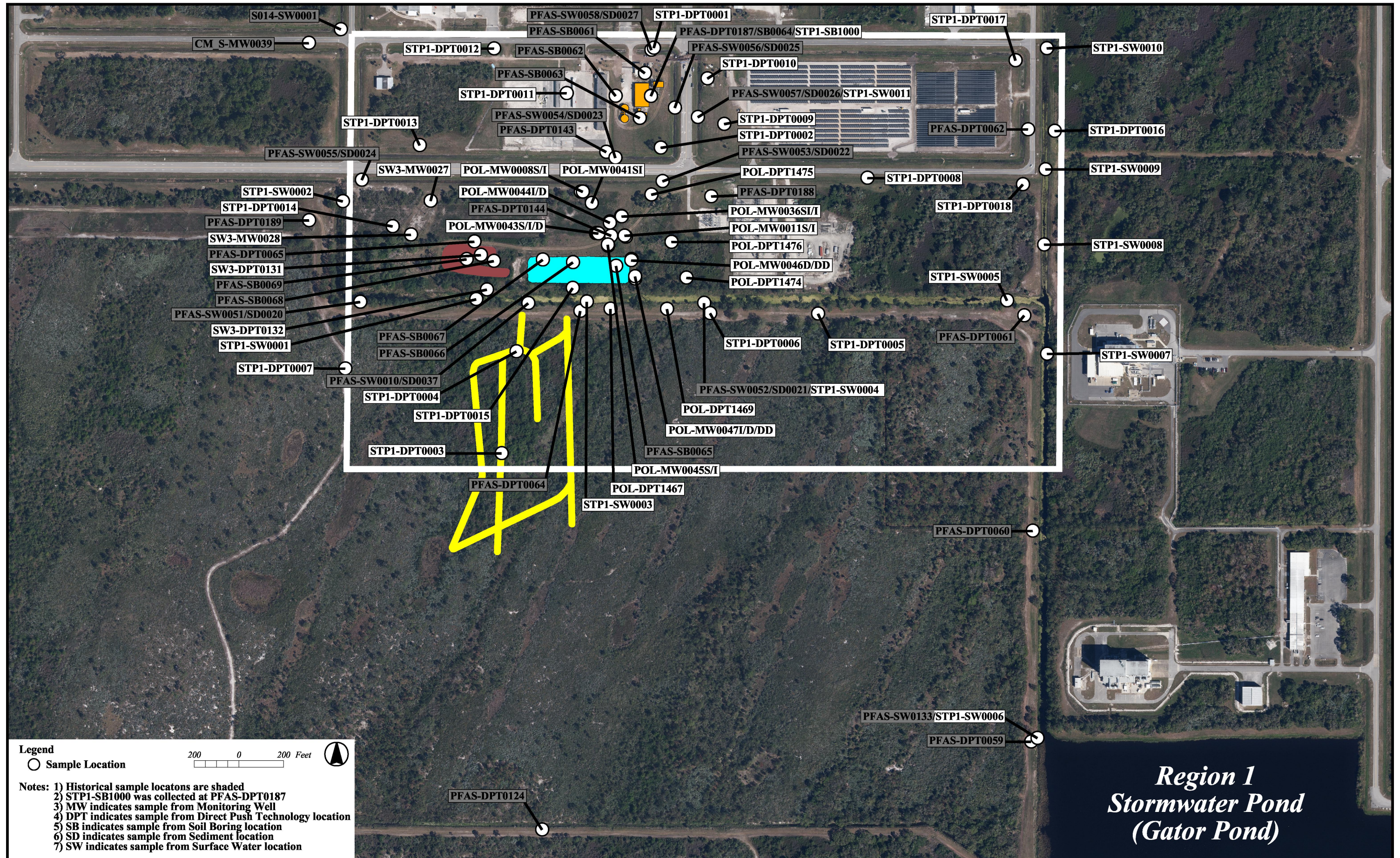
Samples analyzed for 28 PFAS compounds by LC/MS/MS Compliant with QSM 5.3 Table B-15.

ft bls = feet below land surface

PFAS = per- and polyfluoroalkyl substances.



FIGURE 3-1 PFAS SITE ASSESSMENT SAMPLE LOCATIONS  
SWMU 117, KENNEDY SPACE CENTER, FLORIDA





## SECTION IV DATA EVALUATION

### 4.1 DATA EVALUATION AND SCREENING PROCESS

In May 2022, the USEPA issued updated RSLs, calculated using a HQ of 0.1, for PFOA, PFOS, and PFBS, and included RSLs for additional PFAS compounds including PFHxS, PFNA, and HFPO-DA (GenX) (USEPA, 2022). In November 2022, the USEPA RSL tables were updated, but there were no changes to the PFAS screening levels. The USEPA RSLs for Tap Water and Residential Soil were used as project screening levels for this assessment.

The State of Florida developed provisional cleanup target levels for PFAS in various media, as described in the FDEP Dynamic Plan (FDEP, 2022). The published SWSLs for Human Health in freshwater and marine environments for PFOA and PFOS were used as project screening levels for this assessment. Florida currently does not have SWSLs for other PFAS compounds and neither Florida nor USEPA have screening levels for sediment.

Project screening levels for each media sampled during this assessment are presented in the analytical data tables and listed below:

Chemical	Soil RSL <sup>1</sup> (µg/kg)	Groundwater RSL <sup>2</sup> (ng/L)	Surface Water SWSL <sup>3</sup> (ng/L)
HFPO-DA (GenX)	23	6	NA
PFBS	1,900	600	NA
PFHxS	130	39	NA
PFNA	19	5.9	NA
PFOA	19	6	500
PFOS	13	4	10

(1) USEPA residential soil RSLs based on HQ of 0.1.

(2) USEPA Tap Water RSLs based on HQ of 0.1.

(3) State of Florida screening levels for human health in freshwater and marine environments

NA – Not applicable; no screening criteria

### 4.2 SOIL

Seven soil samples were collected from one location (STP1-SB1000) in December 2021 to evaluate PFAS at STP1. The soil results collected during the SA are summarized in Table 4-1

and presented on Figure 4-1. The results are organized to present the six compounds with USEPA RSLs at the top of the table for comparison to the applicable screening criteria. The frequencies of detection along with the maximum detected concentrations for all 28 analyzed compounds are presented in Table 4-2. In addition to the PFAS compounds analyzed, TOC was analyzed in all soil samples to further characterize the soil. The laboratory report for all soil data collected in December 2021 is included in Appendix C. The soil results are further discussed and evaluated below.

Seven soil samples were collected from one sample location, STP1-SB1000, where a continuous soil core was advanced from 0 to 70 ft bls to evaluate the lithology of the area and determine the best placement for groundwater sample screen intervals. The soil boring location was co-located with a previously collected groundwater sample, PFAS-DPT0187, that had an elevated concentration of PFOS (4,520 ng/L) in the 23-27 ft bls interval, and soil sample PFAS-SB0064 in the 0-0.5 and 0.5-2 ft bls depth intervals, which had concentrations of PFOS less than screening criteria. The grab samples were collected from 1-ft sample intervals at 9-10 ft bls, 21-22 ft bls, 29-30 ft bls, 43-44 ft bls, 45-46 ft bls, 49-50 ft bls and 53-54 ft bls. Out of the six PFAS compounds with applicable screening criteria, no PFAS compounds exceeded the RSLs. There were low-level detections of PFOS in the upper three depth intervals, but none exceeded the RSL. It should be noted that all soil samples collected were in the saturated zone.

TOC was analyzed at each of the seven soil samples collected at STP1-SB1000. TOC was analyzed to further characterize the soil and to provide evidence of environmental partitioning and adsorption of PFAS compounds on soil organic carbon. Concentrations of TOC ranged across all samples from 880 to 18,000 mg/kg. The highest result was found in the shallowest interval, 9-10 ft bls, where the lithology was recorded to be black, organic rich sand from 0-10 ft bls. The second highest result (4,600 mg/kg) was found in the 21-22 ft bls interval where the lithology transitions into a brown sand from 10-22 ft bls. At deeper depths between 44 and 54 ft bls where clay and silt were encountered, the TOC concentrations ranged from 3,000 to 3,700 mg/kg. The interval with the lowest concentration of TOC was the interval with fine sands. Overall, TOC results were higher when evidence of organics were noted, and lower when they were absent (which is to be expected). Compared to the PFAS detections found in soil, the higher



TOC found in the shallower intervals corresponded to the intervals where PFAS was detected. The elevated levels of TOC potentially contribute to higher adsorption of PFAS compounds to the soil and conversely to less potential leaching of PFAS from soil to groundwater, though a more robust dataset may be needed to determine if a correlation exists.

### 4.3 GROUNDWATER

A total of 131 DPT groundwater samples were collected from 25 boring locations between October 2021 and March 2022 as part of this SA. Field duplicates were also collected during the field event in February and March 2022. The DPT results are summarized in Table 4-3 and presented on Figure 4-2. The frequencies of detection along with maximum detected concentrations for all 28 analyzed compounds are presented in Table 4-4. Laboratory reports for all groundwater data collected are included in Appendix C.

Of the six compounds with applicable screening criteria, five were detected at concentrations greater than the USEPA RSLs. There were no detections of HFPO-DA (GenX). The locations with the highest detected concentrations of the five compounds in excess of screening criteria were from STP1-DPT0010, located to the east of STP1; STP1-DPT0015, located south of the former Polishing Pond; and SW3-DPT0132, located south of the former Sludge Disposal Area. As shown in Table 4-4, the maximum detections for PFBS (860 ng/L), PFHxS (4,600 ng/L), and PFOS (1,700 ng/L) were from the 8-12 ft bls interval at STP1-DPT0015. The maximum concentration of PFNA (1,000 ng/L) was from the 8-12 ft bls interval at STP1-DPT0010. The maximum concentration of PFOA (19,000 ng/L) was from the 20-24 ft bls interval at SW3-DPT0132. Of the PFAS with RSLs, this PFOA detection was the overall maximum exceedance in groundwater during the SA. As shown in Table 4-3, all STP1 DPT locations had an exceedance of an RSL except STP1-DPT0007 and STP1-DPT0016, located in the most eastern and western extents of the investigation area. Field duplicates were collected from 11 sample locations and the results included in Table 4-3 show that the duplicates were comparable to the parent samples.

Overall, PFAS concentrations were generally higher in the shallower depth intervals, generally decreasing vertically with sample depth. The higher magnitude exceedances are located at STP1-

DPT0015 and SW3-DPT0132, which are approximately 250 feet apart from each other. Both are located in the southern area of the site. STP1-DPT0015 is immediately south of the former Sludge Disposal Area and Polishing Pond, and SW3-DPT0132 is in the former Spray Field. These locations correlate with the southerly direction of groundwater flow at the site but may also be attributed to the application of treated water. The historical dataset generally correlates with the current DPT dataset with the highest exceedances located south of the STP, in the areas of the former Sludge Disposal Area, Polishing Pond, and Spray Field.

A total of 24 groundwater samples were collected from 22 existing monitoring wells located in the southern portion of the STP1 investigation area as part of this SA. The existing wells are associated with the POL and SW3 remediation sites (SWMUs 067 and 088, respectively) and are all located south of 5<sup>th</sup> Street SE. The monitoring well results are summarized in Table 4-5 and presented on Figure 4-2. The frequencies of detection along with the maximum detected concentration for all 18 analyzed compounds are presented in Table 4-6. Laboratory reports for all groundwater data collected are included in Appendix C.

In the monitoring well samples, five of the six PFAS with USEPA RSLs were detected, and PFHxS, PFNA, PFOA and PFOS were detected at concentrations greater than RSLs. There were no detections of HFPO-DA (GenX) and all PFBS detections were less than the RSL. PFHxS was detected in 11 samples at a concentration greater than the RSL of 39 ng/L. The maximum detection was 162.87 ng/L in well POL-MW0047D. PFNA was detected in one sample from POL-MW0045S, at a concentration of 12.9 ng/L, greater than the RSL of 5.9 ng/L. PFOA was detected in 15 samples at a concentration greater than the RSL of 6 ng/L. The maximum concentration was 47.98 ng/L in well POL-MW0045I. PFOS was detected in 13 samples at concentrations greater than the RSL of 4 ng/L. The maximum concentration was 853.44 ng/L in well POL-MW0045S. These wells with maximum concentrations are associated with the POL site (SWMU 067) and are located south of 5<sup>th</sup> Street SE, in and around the areas of the former Sludge Disposal Area and former Polishing Pond.

#### **4.4 SURFACE WATER**

Eleven surface water locations (STP1-SW0001 through STP1-SW0011) were sampled in March 2022. Results for these locations are summarized in Table 4-7 and presented on Figure 4-3. The frequencies of detection along with the maximum concentrations are presented in Table 4-8. The applicable SWSLs are represented at the top of table for PFOA and PFOS. Other PFAS compounds do not have screening criteria for surface water. Laboratory reports for all surface water data are included in Appendix C. Note, the laboratory report also includes samples collected from the STP equipment (STP1-SW0012 through STP1-SW0015), that are not included as part of this SA dataset, but may be included in a future SAPR.

Results showed that PFOA and PFOS were detected in all 11 surface water samples. PFOS exceeded the SWSL of 10 ng/L in 10 of the 11 samples, while PFOA did not exceed the SWSL in any of the samples. PFOS concentrations that exceeded the SWSL ranged from 120 ng/L in STP1-SW0001 and STP1-SW0008, to 1,200 ng/L in STP1-SW0011. Both STP1-SW0008 and STP1-SW0011 were collected from the drainage ditch along the east side of the investigation area, on the east side of C Avenue SE. The STP1-SW0011 location is co-located with the historical sample location with the highest concentration of PFOS (2,280 ng/L in PFAS-SW057). The one location that did not exceed the SWSL of 10 ng/L for PFOS was STP1-SW0010, with a detection of 9.4 ng/L. This sample was collected from the north portion of the drainage ditch along the east side of the study area, east of D Avenue SE.

#### **4.5 FIELD QA/QC EVALUATION**

The analytical results for the field banks and equipment blanks are presented in Table 4-8. The analytical results for field duplicates are presented in the analytical results tables with their parent sample results. As shown in Table 4-9, there were no PFAS detected in the equipment blanks or field blanks. The field duplicate/parent pairs were evaluated and determined to be within the acceptable range for relative percent difference criteria.

Table 4-1. Site Assessment Soil Analytical Results

Location ID Date Sample Depth (ft bls)	CAS No.	Screening Criteria <sup>1,2</sup>	STP1-SB1000						
			12/9/21 9 - 10	12/9/21 21 - 22	12/9/21 29 - 30	12/9/21 43 - 44	12/9/21 45 - 46	12/9/21 49 - 50	12/9/21 53 - 54
<b>PFAS with Screening Criteria (µg/kg)</b>									
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>3</sup>	13252-13-6	<b>23</b>	1.2 U	1.1 U	1 U	1.2 U	1.3 U	1.1 U	1.2 U
Perfluoro-1-butanefulfonic acid (PFBS)	375-73-5	<b>1900</b>	0.23 U	0.23 U	0.2 U	0.24 U	0.25 U	0.22 U	0.25 U
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	<b>130</b>	0.23 U	0.23 U	0.2 U	0.24 U	0.25 U	0.22 U	0.25 U
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	<b>19</b>	0.23 U	0.23 U	0.2 U	0.24 U	0.25 U	0.22 U	0.25 U
Perfluoro-n-octanoic acid (PFOA)	335-67-1	<b>19</b>	0.23 U	0.23 U	0.2 U	0.24 U	0.25 U	0.22 U	0.25 U
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	<b>13</b>	<b>1.9</b>	<b>0.76 I</b>	<b>0.55 I</b>	0.24 U	0.25 U	0.22 U	0.25 U
<b>PFAS without Screening Criteria (µg/kg)</b>									
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	0.58 U	0.57 U	0.5 U	0.6 U	0.63 U	0.56 U	0.62 U
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	<b>1.2 IV</b>	<b>1 IV</b>	0.5 U	0.63 U	0.65 U	0.6 U	0.6 U
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	0.58 U	0.57 U	0.5 U	0.6 U	0.63 U	0.56 U	0.62 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	0.58 U	0.57 U	0.5 U	0.6 U	0.63 U	0.56 U	0.62 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	0.58 U	0.57 U	0.5 U	0.6 U	0.63 U	0.56 U	0.62 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	0.58 U	0.57 U	0.5 U	0.6 U	0.63 U	0.56 U	0.62 U
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	0.58 U	0.57 U	0.5 U	0.6 U	0.63 U	0.56 U	0.62 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	0.58 U	0.57 U	0.5 U	0.6 U	0.63 U	0.56 U	0.62 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	0.58 U	0.57 U	0.5 U	0.6 U	0.63 U	0.56 U	0.62 U
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	0.23 U	0.23 U	0.2 U	0.24 U	0.25 U	0.22 U	0.25 U
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	--	0.23 U	0.23 U	0.2 U	0.24 U	0.25 U	0.22 U	0.25 U
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	0.23 U	0.23 U	0.2 U	0.24 U	0.25 U	0.22 U	0.25 U
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	0.23 U	0.23 U	0.2 U	0.24 U	0.25 U	0.22 U	0.25 U
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	0.23 U	0.23 U	0.2 U	0.24 U	0.25 U	0.22 U	0.25 U
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	0.23 U	0.23 U	0.2 U	0.24 U	0.25 U	0.22 U	0.25 U
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	0.23 U	0.23 U	0.2 U	0.24 U	0.25 U	0.22 U	0.25 U
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	0.23 U	0.23 U	0.2 U	0.24 U	0.25 U	0.22 U	0.25 U
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	0.23 U	0.23 U	0.2 U	0.24 U	0.25 U	0.22 U	0.25 U
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	0.23 U	0.23 U	0.2 U	0.24 U	0.25 U	0.22 U	0.25 U
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	--	0.23 U	0.23 U	0.2 U	0.24 U	0.25 U	0.22 U	0.25 U
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	--	0.23 U	0.23 U	0.2 U	0.24 U	0.25 U	0.22 U	0.25 U
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	--	0.23 U	0.23 U	0.2 U	0.24 U	0.25 U	0.22 U	0.25 U
<b>Other Parameters (mg/kg)</b>									
Total Organic Carbon (TOC)	--	--	<b>18,000</b>	<b>4,600</b>	<b>880</b>	<b>1,500</b>	<b>3,400</b>	<b>3,000</b>	<b>3,700</b>

1 The USEPA Regional Screening Levels (RSLs) for HFPO-DA, PFBS, PFHxS, PFNA, PFOA, and PFOS are presented in this table.

2 The Soil RSL is cited from the USEPA Regional Screening Levels and calculated with the USEPA RSL Calculator based on a hazard quotient of 0.1 (USEPA, 2022)

3 HFPO-DA is commonly referred to as GenX

Sample STP1-SB1000 was inadvertently named "STP1-SB0001" during sample collection, as reflected in the field log and laboratory analytical report.

-- = No applicable screening criteria

Bolding indicates analyte was detected

Shading indicates exceedance of screening criteria

STP1 = Sewage Treatment Plant #1

EPA = United States Environmental Protection Agency

ft bls = feet below land surface

PFAS = per- and polyfluoroalkyl substances

I = Estimated result < Limit of Quantitation and ≥ Detection Limit

U = Analyte was not detected

V = Detected in the method blank

Note: A data quality review was performed by Tetra Tech's data manager and the results provided in this table were found to have been generated in conformance with good analytical practices. Some minor nonconformance issues were noted in the quality control elements associated with project samples, and the appropriate data qualification was applied to the affected results as needed. Per the FDEP reporting convention described in Chapter 62-160, F.A.C., non-detect values are reported to the method detection limit. Additional details on data quality are included in the analytical reports provided in the Appendices.

Table 4-2. Site Assessment Soil Frequencies of Detection

Parameter	CAS No.	Screening Criteria <sup>1,2</sup>	Method DoD QSM 5.3						
			No. of Samples <sup>3</sup>	No. of Detections	Minimum Concentration (µg/kg)	Maximum Concentration (µg/kg)	Location with Maximum Concentration	Average Concentration (Detections Only)	No. Samples > Screening Level
<b>PFAS with Screening Criteria (µg/kg)</b>									
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>4</sup>	13252-13-6	23	7	0	NA	NA	NA	NA	NA
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	1900	7	0	NA	NA	NA	NA	NA
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	130	7	0	NA	NA	NA	NA	NA
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	19	7	0	NA	NA	NA	NA	NA
Perfluoro-n-octanoic acid (PFOA)	335-67-1	19	7	0	NA	NA	NA	NA	NA
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	13	7	3	0.55	1.9	STP1-SB1000-009.5-20211209	1	0
<b>PFAS without Screening Criteria (µg/kg)</b>									
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	7	0	NA	NA	NA	NA	NA
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	7	2	1.0	1.2	STP1-SB1000-009.5-20211209	1.1	NA
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	7	0	NA	NA	NA	NA	NA
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	7	0	NA	NA	NA	NA	NA
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	7	0	NA	NA	NA	NA	NA
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	7	0	NA	NA	NA	NA	NA
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	7	0	NA	NA	NA	NA	NA
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	7	0	NA	NA	NA	NA	NA
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	7	0	NA	NA	NA	NA	NA
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	7	0	NA	NA	NA	NA	NA
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	--	7	0	NA	NA	NA	NA	NA
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	7	0	NA	NA	NA	NA	NA
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	7	0	NA	NA	NA	NA	NA
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	7	0	NA	NA	NA	NA	NA
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	7	0	NA	NA	NA	NA	NA
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	7	0	NA	NA	NA	NA	NA
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	7	0	NA	NA	NA	NA	NA
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	7	0	NA	NA	NA	NA	NA
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	7	0	NA	NA	NA	NA	NA
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	--	7	0	NA	NA	NA	NA	NA
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	--	7	0	NA	NA	NA	NA	NA
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	--	7	0	NA	NA	NA	NA	NA

All results reported in microgram per kilogram (µg/kg)

1 The USEPA Regional Screening Levels (RSLs) for HFPO-DA, PFBS, PFHxS, PFNA, PFOA, and PFOS are presented in this table.

2 The Soil RSL is cited from the USEPA Regional Screening Levels and calculated with the USEPA RSL Calculator based on a hazard quotient of 0.1 (USEPA, 2022)

3 QA/QC samples are not included in the dataset.

4 HFPO-DA is commonly referred to as GenX

-- = No applicable screening criteria

STP1 = Sewage Treatment Plant #1

USEPA = United States Environmental Protection Agency

NA = Not Applicable; not detected or no screening criteria

PFAS = per- and polyfluoroalkyl substances

Table 4-3. Site Assessment DPT Analytical Results

Location ID Date Sample Depth (ft bls)	CAS No.	Screening Criteria <sup>1,2</sup>	POL-DPT1467				POL-DPT1469				POL-DPT1474			
			10/21/2021	10/21/2021	10/21/2021	10/21/2021	10/22/2021	10/22/2021	10/22/2021	10/22/2021	10/26/2021	10/26/2021	10/26/2021	10/26/2021
			10 - 14	20 - 24	30 - 34	40 - 44	10 - 14	20 - 24	30 - 34	40 - 44	10 - 14	20 - 24	30 - 34	40 - 44
<b>PFAS with Screening Criteria (ng/L)</b>														
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>3</sup>	13252-13-6	6	1.7 U	1.7 U	1.8 U	1.7 U	20 U	1.8 U	2.1 U	1.7 U	1.8 U	1.7 U	1.8 U	1.8 U
Perfluoro-1-butananesulfonic acid (PFBS)	375-73-5	600	20	53	54	37	10 U	24	37	8.9	1.1 I	24	22	1.3 I
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	39	95	270	270	220	10 U	120	200	46	8	120	260	8.6
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	5.9	3.5	5.6	5.3	6.2	10 U	2.8 I	7.1	1.5 I	0.89 U	2.3 I	18	0.88 U
Perfluoro-n-octanoic acid (PFOA)	335-67-1	6	26	64	65	96	10 U	42	70	12	1 I	27	180	2.4 I
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	4	230	470	500	340	16 I	160	470	43	4.1	17	120	3.1 I
<b>PFAS without Screening Criteria (ng/L)</b>														
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	1.7 U	1.7 U	1.8 U	7 Q	20 U	1.8 U	2.1 U	2.1 IQ	1.8 U	1.7 U	1.8 U	1.8 U
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	4.4 I	26	24	160	20 U	11	41	27	1.8 U	48	360	3.8 J
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	1.7 U	1.8 I	4.7 I	11	20 U	1.8 U	8.9	1.7 U	1.8 U	1.7 U	4 I	1.8 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	1.7 U	1.7 U	1.8 U	1.7 U	20 U	1.8 U	2.1 U	1.7 U	1.8 U	1.7 U	1.8 U	1.8 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	1.7 U	1.7 U	1.8 U	1.7 U	20 U	1.8 U	2.1 U	1.7 U	1.8 U	1.7 U	1.8 U	1.8 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	1.7 U	1.7 U	1.8 U	1.7 U	20 U	1.8 U	2.1 U	1.7 U	1.8 U	1.7 U	1.8 U	1.8 U
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	1.7 U	1.7 U	1.8 U	1.7 U	20 U	1.8 U	2.1 U	1.7 U	1.8 U	1.7 U	1.8 U	1.8 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	1.7 U	1.7 U	2.6 I	1.7 U	20 U	1.8 U	2.1 U	1.7 U	1.8 U	1.7 U	1.8 U	1.8 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	1.7 U	1.7 U	1.8 U	1.7 U	20 U	1.8 U	2.1 U	1.7 U	1.8 U	1.7 U	1.8 U	1.8 U
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	40 Q	55 Q	79 Q	20 Q	25 I	23	27 Q	4.8	6	28 Q	140 Q	6
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	--	0.85 U	0.86 U	0.88 U	0.83 U	10 U	0.9 U	1 U	0.86 U	0.89 U	0.87 U	0.88 U	0.88 U
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	0.85 U	0.91 I	1.6 I	0.83 U	10 U	0.9 U	1.3 I	0.87 U	0.89 U	0.87 U	0.88 U	0.88 U
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	0.85 U	0.86 U	0.88 U	0.83 U	10 U	0.9 U	1 U	0.86 U	0.89 U	0.87 U	0.88 U	0.88 U
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	2.9 I	8.1	6.5	10	10 U	3.7	7.9	1.7 I	0.89 U	1.3 I	6.3	0.88 U
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	14	33	35	30	10 U	20	29	5.3	0.89 U	47	400	7.3
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	29	73	78	82	10 U	38	59	23	0.89 U	63	320	11
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	0.85 U	0.86 U	0.88 U	0.83 U	10 U	0.9 U	1 U	0.86 U	0.89 U	0.87 U	0.88 U	0.88 U
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	11	37	38	27	10 U	16	26	6.5	1 I	22	27	1.2 I
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	41	81	100	56	10 U	28	40	12	1.3 I	72	400	16
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	--	0.85 U	0.86 U	0.88 U	0.83 U	10 U	0.9 U	1 U	0.86 U	0.89 U	0.87 U	0.88 U	0.88 U
Perfluoro-n-tridecanoic acid (PFTTrDA)	72629-94-8	--	0.85 U	0.86 U	0.88 U	0.83 U	10 U	0.9 U	1 U	0.86 U	0.89 U	0.87 U	0.88 U	0.88 U
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	--	0.85 U	0.86 U	0.88 U	0.83 U	10 U	0.9 U	1 U	0.87 U	0.89 U	0.87 U	0.88 U	0.88 U

Table 4-3. Site Assessment DPT Analytical Results (Continued)

Location ID Date Sample Depth (ft bls)	CAS No.	Screening Criteria <sup>1,2</sup>	POL-DPT1475				POL-DPT1476				SW3-DPT0131			
			10/26/2021	10/26/2021	10/26/2021	10/26/2021	10/28/2021	10/28/2021	10/28/2021	10/28/2021	11/2/2021	11/2/2021	11/2/2021	11/2/2021
			10 - 14	20 - 24	30 - 34	40 - 44	10 - 14	20 - 24	30 - 34	40 - 44	10 - 14	20 - 24	30 - 34	40 - 44
<b>PFAS with Screening Criteria (ng/L)</b>														
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>3</sup>	13252-13-6	6	1.8 U	1.8 U	1.8 U	1.7 U	20 U	2.1 U	1.9 U	1.8 U	1.9 U	90 U	1.7 U	1.8 U
Perfluoro-1-butananesulfonic acid (PFBS)	375-73-5	600	6.1	4.3	15	28	10 U	5.8	49	2.1 I	5	45 U	1.4 I	1.3 I
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	39	96	91	370	270	10 U	29	270	9.8	240 S	140 JD	7.7	6.6
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	5.9	0.88 U	0.89 U	1.6 I	0.85 U	10 U	1.1 U	9.3	0.89 U	830 D	800 D	3.4 I	0.9 U
Perfluoro-n-octanoic acid (PFOA)	335-67-1	6	14	90	92	11	10 U	7.6	44	11	0.93 U	10000 D	28	3.7
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	4	0.88 U	0.89 U	70	0.85 U	10 U	7.2	110	0.92 I	1500 D	350 D	12	2.2 I
<b>PFAS without Screening Criteria (ng/L)</b>														
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	1.8 U	1.8 U	1.8 U	1.7 U	20 U	2.1 U	1.9 U	1.8 U	150 QS	90 U	5.5 IQ	1.8 U
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	1.8 U	2.4 J	100	18	20 U	2.1 U	81 Q	5.5 I	23000 LD	6500 LD	60 B	6.9 B
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	1.8 U	1.8 U	1.8 U	1.7 U	20 U	2.1 U	1.9 U	1.8 U	10	90 U	5.1 I	1.8 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	1.8 U	1.8 U	1.8 U	1.7 U	20 U	2.1 U	1.9 U	1.8 U	1.9 U	90 U	1.7 U	1.8 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	1.8 U	1.8 U	1.8 U	1.7 U	20 U	2.1 U	1.9 U	1.8 U	1.9 U	90 U	1.7 U	1.8 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	1.8 U	1.8 U	1.8 U	1.7 U	20 U	2.1 U	1.9 U	1.8 U	1.9 U	90 U	1.7 U	1.8 U
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	1.8 U	1.8 U	1.8 U	1.7 U	20 U	2.1 U	1.9 U	1.8 U	1.9 U	90 U	1.7 U	1.8 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	1.8 U	1.8 U	1.8 U	1.7 U	20 U	2.1 U	1.9 U	1.8 U	1.9 U	90 U	1.7 U	1.8 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	1.8 U	1.8 U	1.8 U	1.7 U	20 U	2.1 U	1.9 U	1.8 U	1.9 U	90 U	1.7 U	1.8 U
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	27 Q	27 Q	31 Q	12	10 U	65	39	4.3	6800 D	5800 D	59 Q	2.5 I
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	--	0.88 U	0.89 U	0.88 U	0.85 U	10 U	1.1 U	0.93 U	0.89 U	0.93 U	45 U	0.87 U	0.9 U
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	0.88 U	0.89 U	0.88 U	0.85 U	10 U	1.1 U	0.93 U	0.89 U	7.2	45 U	0.87 U	0.9 U
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	0.88 U	0.89 U	0.88 U	0.85 U	10 U	1.1 U	0.93 U	0.89 U	0.93 U	45 U	0.87 U	0.9 U
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	0.88 U	0.89 U	8.1	0.85 U	10 U	1.1 U	3.8	0.89 U	26	45 U	0.87 U	0.9 U
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	66	57	44	13	10 U	6.9	52	9.6	12000 D	11000 D	40	2.8 I
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	45	39	88	53	10 U	13	100	9.1	16000 D	13000 D	74	4.6
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	0.88 U	0.89 U	0.88 U	0.85 U	10 U	1.1 U	0.93 U	0.89 U	0.93 U	45 U	0.87 U	0.9 U
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	7.4	4.9	25	40	10 U	3.3 I	51	2.4 I	6.6	45 U	1.3 I	0.98 I
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	37	41	90	37	10 U	15	85	10	26000 D	20000 D	120	6.2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	--	0.88 U	0.89 U	0.88 U	0.85 U	10 U	1.1 U	0.93 U	0.89 U	0.93 U	45 U	0.87 U	0.9 U
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	--	0.88 U	0.89 U	0.88 U	0.85 U	10 U	1.1 U	0.93 U	0.89 U	0.93 U	45 U	0.87 U	0.9 U
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	--	0.88 U	0.89 U	0.88 U	0.85 U	10 U	1.1 U	0.93 U	0.89 U	0.93 U	45 U	0.87 U	0.9 U

Table 4-3. Site Assessment DPT Analytical Results (Continued)

Location ID Date Sample Depth (ft bls)	CAS No.	Screening Criteria <sup>1,2</sup>	SW3-DPT0132				STP1-DPT0001					
			11/2/2021	11/2/2021	11/2/2021	11/2/2021	2/17/2022	2/17/2022	2/17/2022	2/17/2022	2/17/2022	2/17/2022
			10 - 14	20 - 24	30 - 34	40 - 44	3 - 7	8 - 12	14 - 18	21 - 25	31 - 35	40 - 44
<b>PFAS with Screening Criteria (ng/L)</b>												
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>3</sup>	13252-13-6	6	1.8 U	1.7 U	35 U	1.7 U	20 U	20 U	20 U	20 U	1.9 U	1.8 U
Perfluoro-1-butananesulfonic acid (PFBS)	375-73-5	600	1.5 I	20	17 U	15	10 U	10 U	10 U	10 U	760	2.1 I
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	39	71	440	81 D	110	39 I	35 I	43	74	2100	6.6
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	5.9	57	99	17 U	5.1	10 U	10 U	10 U	10 U	0.95 U	0.9 U
Perfluoro-n-octanoic acid (PFOA)	335-67-1	6	230	19000 D	140 D	60	10 U	10 U	12 I	14 I	70	7.6
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	4	900 D	580	290 D	260	58	10 U	13 I	22 I	3.5 I	0.9 U
<b>PFAS without Screening Criteria (ng/L)</b>												
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	2.6 IQ	7700 D	500 D	4 IQ	20 U	20 U	20 U	20 U	110	1.8 U
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	410 BD	730000 BD	11000 BD	240 B	20 U	20 U	20 U	20 U	630	1.8 U
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	1.8 U	5.6 I	35 U	2.5 I	20 U	20 U	20 U	20 U	1.9 U	1.8 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	1.8 U	1.7 U	35 U	1.7 U	20 U	20 U	20 U	20 U	1.9 U	1.8 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	1.8 U	1.7 U	35 U	1.7 U	20 U	20 U	20 U	20 U	1.9 U	1.8 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	1.8 U	1.7 U	35 U	1.7 U	20 U	20 U	20 U	20 U	1.9 U	1.8 U
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	1.8 U	1.7 U	35 U	1.7 U	20 U	20 U	20 U	20 U	1.9 U	1.8 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	1.8 U	1.7 U	35 U	1.7 U	20 U	20 U	20 U	20 U	1.9 U	1.8 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	1.8 U	1.7 U	35 U	1.7 U	20 U	20 U	20 U	20 U	1.9 U	1.8 U
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	210 Q	15000 D	520 D	16 Q	14 I	11 I	10 U	10 U	190	1.3 I
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	--	0.89 U	0.87 U	17 U	0.85 U	10 U	10 U	10 U	10 U	0.95 U	0.9 U
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	1.3 I	0.87 U	17 U	0.85 U	10 U	10 U	10 U	10 U	0.95 U	0.9 U
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	0.89 U	0.87 U	17 U	0.85 U	10 U	10 U	10 U	10 U	0.95 U	0.9 U
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	10	21	17 U	6.9	10 U	10 U	10 U	10 U	1.7 I	0.9 U
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	330	20000 D	390 D	24	10 U	10 U	10 U	10 U	170	0.9 U
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	500	38000 D	1300 D	55	15 I	18 I	10 U	13 I	1000	2.6 I
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	0.89 U	0.87 U	17 U	0.85 U	10 U	10 U	10 U	10 U	0.95 U	0.9 U
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	2.8 I	29	17 U	13	10 U	10 U	10 U	10 U	680	2.3 I
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	770	62000 D	1400 D	46	22 I	28 I	10 U	10 U	460	0.9 U
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	--	0.89 U	0.87 U	17 U	0.85 U	10 U	10 U	10 U	10 U	0.95 U	0.9 U
Perfluoro-n-tridecanoic acid (PFTriDA)	72629-94-8	--	0.89 U	0.87 U	17 U	0.85 U	10 U	10 U	10 U	10 U	0.95 U	0.9 U
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	--	0.89 U	0.87 U	17 U	0.85 U	10 U	10 U	10 U	10 U	0.95 U	0.9 U



**Table 4-3. Site Assessment DPT Analytical Results (Continued)**

Location ID Date Sample Depth (ft bls)	CAS No.	Screening Criteria <sup>1,2</sup>	STP1-DPT0002						STP1-DPT0003						
			2/17/2022	2/17/2022	2/17/2022	2/17/2022	2/17/2022	2/17/2022	2/21/2022	2/21/2022	2/21/2022	2/21/2022	2/21/2022	2/21/2022	
			3 - 7	8 - 12	14 - 18	21 - 25	31 - 35	40 - 44	8 - 12	8 - 12*	14 - 18	14 - 18*	21 - 25	31 - 35	40 - 44
<b>PFAS with Screening Criteria (ng/L)</b>															
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>3</sup>	13252-13-6	6	20 U	20 U	20 U	20 U	20 U	2.3 U	1.8 U	1.8 U	1.7 U	1.8 U	1.7 U	1.9 U	1.8 U
Perfluoro-1-butananesulfonic acid (PFBS)	375-73-5	600	10 U	10 U	10 U	10 U	10 I	31	9.2	8.1	11	19	13	26	46
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	39	28 I	77	58	56	220	360	240	230	300	440	110	91	190
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	5.9	10 U	10 U	10 U	10 U	10 U	1.1 U	7.8	7.9	6.1	4.9	7.4	4.4	6.3
Perfluoro-n-octanoic acid (PFOA)	335-67-1	6	84	170	53	65	55	46	64	58	68	89	43	49	75
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	4	350	45	10 U	10 U	88	16	530	480	470	420	660	420	960
<b>PFAS without Screening Criteria (ng/L)</b>															
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	20 U	20 U	20 U	20 U	20 U	2.3 U	1.8 U	1.8 U	1.7 U	1.8 U	1.7 U	1.9 U	4.2 I
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	20 U	20 U	20 U	20 U	98	200	27	27	7	8.5	1.7 I	5 I	91
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	20 U	20 U	20 U	20 U	20 U	2.3 U	2.3 I	2.4 I	2.2 I	5.8 I	1.7 U	1.9 U	8.6
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	20 U	20 U	20 U	20 U	20 U	2.3 U	1.8 U	1.8 U	1.7 U	1.8 U	1.7 U	1.9 U	1.8 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	20 U	20 U	20 U	20 U	20 U	2.3 U	1.8 U	1.8 U	1.7 U	1.8 U	1.7 U	1.9 U	1.8 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	20 U	20 U	20 U	20 U	20 U	2.3 U	1.8 U	1.8 U	1.7 U	1.8 U	1.7 U	1.9 U	1.8 U
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	20 U	20 U	20 U	20 U	20 U	2.3 U	1.8 U	1.8 U	1.7 U	1.8 U	1.7 U	1.9 U	1.8 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	20 U	20 U	20 U	20 U	20 U	2.3 U	1.8 U	1.8 U	1.7 U	6.5 I	1.7 U	1.9 U	2.9 I
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	20 U	20 U	20 U	20 U	20 U	2.3 U	1.8 U	1.8 U	1.7 U	1.8 U	1.7 U	1.9 U	1.8 U
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	61	51	26 I	18 I	29 I	58	72	72	75	120	7.3	8.8	18
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	--	10 U	10 U	10 U	10 U	10 U	1.1 U	0.9 U	0.91 U	0.87 U	0.89 U	0.86 U	0.93 U	0.88 U
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	10 U	10 U	10 U	10 U	10 U	1.1 U	0.9 U	0.91 U	0.87 U	1.2 I	3.3 I	1.6 I	1.5 I
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	10 U	10 U	10 U	10 U	10 U	1.1 U	0.9 U	0.91 U	0.87 U	0.89 U	0.86 U	0.93 U	0.88 U
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	10 U	10 U	10 U	10 U	10 U	3.2 I	11	11	10	14	7.2	4.8	9.1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	20 I	61	44	45	44	70	30	29	55	64	10	16	30
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	26 I	41	29 I	30 I	65	190	58	60	89	110	12	29	84
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	10 U	10 U	10 U	10 U	10 U	1.1 U	0.9 U	0.91 U	0.87 U	0.89 U	0.86 U	0.93 U	0.88 U
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	10 U	10 U	10 U	10 U	13 I	51	16	14	16	29	13	11	30
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	21 I	41	24 I	25 I	72	220	75	75	110	180	9.5	22	51
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	--	10 U	10 U	10 U	10 U	10 U	1.1 U	0.9 U	0.91 U	0.87 U	0.89 U	0.86 U	0.93 U	0.88 U
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	--	10 U	10 U	10 U	10 U	10 U	1.1 U	0.9 U	0.91 U	0.87 U	0.89 U	0.86 U	0.93 U	0.88 U
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	--	10 U	10 U	10 U	10 U	10 U	1.1 U	0.9 U	0.91 U	0.87 U	0.89 U	0.86 U	0.93 U	0.88 U

Table 4-3. Site Assessment DPT Analytical Results (Continued)

Location ID Date Sample Depth (ft bls)	CAS No.	Screening Criteria <sup>1,2</sup>	STP1-DPT0004					STP1-DPT0005				
			2/21/2022	2/21/2022	2/21/2022	2/21/2022	2/21/2022	2/22/2022	2/22/2022	2/22/2022	2/22/2022	2/22/2022
			8 - 12	14 - 18	21 - 25	31 - 35	40 - 44	8 - 12	14 - 18	21 - 25	31 - 35	40 - 44
<b>PFAS with Screening Criteria (ng/L)</b>												
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>3</sup>	13252-13-6	6	20 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	20 U
Perfluoro-1-butanedisulfonic acid (PFBS)	375-73-5	600	10 U	19	27	30	50	0.89 U	0.89 U	0.9 U	16	10 U
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	39	240	430	130	120	440	1 I	0.95 I	0.9 U	21	10 U
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	5.9	10 U	4.6	18	9.3	16	0.89 U	0.89 U	0.9 U	0.88 U	10 U
Perfluoro-n-octanoic acid (PFOA)	335-67-1	6	72	93	73	68	160	0.89 U	0.89 U	0.9 U	9.9	10 U
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	4	680	430	1100	1000	610	0.89 U	0.89 U	0.9 U	1 I	10 U
<b>PFAS without Screening Criteria (ng/L)</b>												
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	20 U	1.8 U	1.8 U	1.8 U	7	1.8 U	1.8 U	1.8 U	1.8 U	20 U
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	20 U	11	14	21	320	1.8 U	1.8 U	1.8 U	4.8 I	20 U
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	20 U	5.5 I	12	15	5.1 I	1.8 U	1.8 U	1.8 U	1.8 U	20 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	20 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	20 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	20 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	20 U
4,8-dioxo-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	20 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	20 U
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	20 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	20 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	20 U	5.7 I	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	20 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	20 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	20 U
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	44	120	11	12	24	6.1	6.4	0.9 U	5	10 U
Perfluoro-1-decanedisulfonic acid (PFDS)	335-77-3	--	10 U	0.9 U	0.9 U	0.92 U	0.89 U	0.89 U	0.89 U	0.9 U	0.88 U	10 U
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	10 U	1.3 I	1.1 I	1.6 I	0.89 U	0.89 U	0.89 U	0.9 U	0.88 U	10 U
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	10 U	0.9 U	0.9 U	0.92 U	0.89 U	0.89 U	0.89 U	0.9 U	0.88 U	10 U
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	11 I	16	10	8.6	29	0.89 U	0.89 U	0.9 U	0.88 U	10 U
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	19 I	63	24	21	52	0.89 U	0.89 U	0.9 U	3.8	10 U
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	19 I	120	39	33	120	0.89 U	0.89 U	0.9 U	12	10 U
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	10 U	0.9 U	0.9 U	0.92 U	0.89 U	0.89 U	0.89 U	0.9 U	0.88 U	10 U
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	10 U	28	19	16	44	0.89 U	0.89 U	0.9 U	4.4	10 U
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	22 I	180	42	24	71	0.89 U	0.89 U	0.9 U	11	10 U
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	--	10 U	0.9 U	0.9 U	0.92 U	0.89 U	0.89 U	0.89 U	0.9 U	0.88 U	10 U
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	--	10 U	0.9 U	0.9 U	0.92 U	0.89 U	0.89 U	0.89 U	0.9 U	0.88 U	10 U
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	--	10 U	0.9 U	0.9 U	0.92 U	0.89 U	0.89 U	0.89 U	0.9 U	0.88 U	10 U

Table 4-3. Site Assessment DPT Analytical Results (Continued)

Location ID Date Sample Depth (ft bls)	CAS No.	Screening Criteria <sup>1,2</sup>	STP1-DPT0006						STP1-DPT0007					
			2/22/2022	2/22/2022	2/22/2022	2/22/2022	2/22/2022	2/22/2022	2/22/2022	2/22/2022	2/22/2022	2/22/2022	2/22/2022	
			8 - 12	8 - 12*	14 - 18	21 - 25	31 - 35	40 - 44	3 - 7	8 - 12	14 - 18	21 - 25	31 - 35	40 - 44
<b>PFAS with Screening Criteria (ng/L)</b>														
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>3</sup>	13252-13-6	6	20 U	1.8 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	20 U	1.8 U	1.8 U
Perfluoro-1-butananesulfonic acid (PFBS)	375-73-5	600	10 U	0.92 U	10 U	34	79	2.6 I	10 U	10 U	10 U	10 U	0.89 U	1.9 I
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	39	10 U	0.92 U	10 U	16	480	9.9	10 U	10 U	10 U	10 U	6.1	4.1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	5.9	10 U	0.92 U	10 U	0.89 U	12	0.88 U	10 U	10 U	10 U	10 U	0.89 U	0.89 U
Perfluoro-n-octanoic acid (PFOA)	335-67-1	6	10 U	0.92 U	10 U	5.9	170	3.5	10 U	10 U	10 U	10 U	3.1 I	3.3 I
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	4	10 U	0.92 U	10 U	2.7 I	310	0.88 U	10 U	10 U	10 U	10 U	0.89 U	0.89 U
<b>PFAS without Screening Criteria (ng/L)</b>														
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	20 U	1.8 U	20 U	1.8 U	11	1.8 U	20 U	20 U	20 U	20 U	1.8 U	1.8 U
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	20 U	1.8 U	20 U	3.7 I	240	4.3 I	20 U	20 U	20 U	20 U	1.8 U	1.8 U
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	20 U	1.8 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	20 U	1.8 U	1.8 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	20 U	1.8 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	20 U	1.8 U	1.8 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	20 U	1.8 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	20 U	1.8 U	1.8 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	20 U	1.8 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	20 U	1.8 U	1.8 U
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	20 U	1.8 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	20 U	1.8 U	1.8 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	20 U	1.8 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	20 U	1.8 U	1.8 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	20 U	1.8 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	20 U	1.8 U	1.8 U
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	10 U	0.92 U	10 U	7.5	43	2 I	10 U	10 U	10 U	10 U	1.9 I	2.2 I
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	--	10 U	0.92 U	10 U	0.89 U	0.92 U	0.88 U	10 U	10 U	10 U	10 U	0.89 U	0.89 U
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	10 U	0.92 U	10 U	0.89 U	0.92 U	0.88 U	10 U	10 U	10 U	10 U	0.89 U	0.89 U
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	10 U	0.92 U	10 U	0.89 U	0.92 U	0.88 U	10 U	10 U	10 U	10 U	0.89 U	0.89 U
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	10 U	0.92 U	10 U	0.89 U	21	0.88 U	10 U	10 U	10 U	10 U	0.89 U	0.89 U
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	10 U	0.92 U	10 U	3.7	70	1.6 I	10 U	10 U	10 U	10 U	2.2 I	1.7 I
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	10 U	0.92 U	10 U	19	200	6.6	10 U	10 U	10 U	10 U	3 I	3.4 I
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	10 U	0.92 U	10 U	0.89 U	0.92 U	0.88 U	10 U	10 U	10 U	10 U	0.89 U	0.89 U
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	10 U	0.92 U	10 U	5.8	57	1.9 I	10 U	10 U	10 U	10 U	1.1 I	1 I
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	10 U	0.92 U	10 U	17	130	4.9	10 U	10 U	10 U	10 U	4.1	4.5
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	--	10 U	0.92 U	10 U	0.89 U	0.92 U	0.88 U	10 U	10 U	10 U	10 U	0.89 U	0.89 U
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	--	10 U	0.92 U	10 U	0.89 U	0.92 U	0.88 U	10 U	10 U	10 U	10 U	0.89 U	0.89 U
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	--	10 U	0.92 U	10 U	0.89 U	0.92 U	0.88 U	10 U	10 U	10 U	10 U	0.89 U	0.89 U

Table 4-3. Site Assessment DPT Analytical Results (Continued)

Location ID Date Sample Depth (ft bls)	CAS No.	Screening Criteria <sup>1,2</sup>	STP1-DPT0008						STP1-DPT0009							
			2/23/2022	2/23/2022	2/23/2022	2/23/2022	2/23/2022	2/23/2022	2/23/2022	2/23/2022	2/23/2022	2/23/2022	2/23/2022	2/23/2022		
			3 - 7	3 - 7*	8 - 12	14 - 18	21 - 25	31 - 35	40 - 44	3 - 7	8 - 12	14 - 18	21 - 25	21 - 25*	31 - 35	40 - 44
<b>PFAS with Screening Criteria (ng/L)</b>																
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>3</sup>	13252-13-6	6	2.1 U	1.8 U	1.9 U	1.8 U	1.8 U	1.8 U	2.6 U	20 U	20 U	20 U	2.7 U	1.8 U	2 U	2.4 U
Perfluoro-1-butananesulfonic acid (PFBS)	375-73-5	600	1 U	1.6 I	0.93 U	98	11	3 I	1.3 U	10 U	10 U	10 U	12	7.4	7.1	10
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	39	36	34	15	2000	120	36	6.4	10 U	18 I	10 U	120	82	78	92
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	5.9	1.7 I	1.4 I	0.93 U	1.6 I	0.92 U	0.91 U	1.3 U	10 U	10 U	10 U	3.2 I	2.1 I	210	24
Perfluoro-n-octanoic acid (PFOA)	335-67-1	6	6.4	5.9	1.2 I	190	7.4	1.9 I	1.3 U	19 I	32 I	10 U	14	8.3	420	210
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	4	77	69	67	180	1.2 I	0.91 U	7.1	32 I	10 U	10 U	58	36	130	10
<b>PFAS without Screening Criteria (ng/L)</b>																
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	2.1 U	1.8 U	1.9 U	1.8 U	1.8 U	1.8 U	2.6 U	20 U	20 U	20 U	2.7 U	1.8 U	2 U	4.5 I
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	2.1 U	1.8 U	1.9 U	1.8 I	1.8 U	1.8 U	1.9 U	20 U	20 U	20 U	1.8 U	1.8 U	720	580 V
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	2.1 U	1.8 U	1.9 U	5.8 I	1.8 U	1.8 U	2.6 U	20 U	20 U	20 U	2.7 U	1.8 U	2 U	2.4 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	2.1 U	1.8 U	1.9 U	1.8 U	1.8 U	1.8 U	2.6 U	20 U	20 U	20 U	2.7 U	1.8 U	2 U	2.4 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	2.1 U	1.8 U	1.9 U	1.8 U	1.8 U	1.8 U	2.6 U	20 U	20 U	20 U	2.7 U	1.8 U	2 U	2.4 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	2.1 U	1.8 U	1.9 U	1.8 U	1.8 U	1.8 U	2.6 U	20 U	20 U	20 U	2.7 U	1.8 U	2 U	2.4 U
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	2.1 U	1.8 U	1.9 U	1.8 U	1.8 U	1.8 U	2.6 U	20 U	20 U	20 U	2.7 U	1.8 U	2 U	2.4 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	2.1 U	1.8 U	1.9 U	1.8 U	1.8 U	1.8 U	2.6 U	20 U	20 U	20 U	2.7 U	1.8 U	2 U	2.4 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	2.1 U	1.8 U	1.9 U	1.8 U	1.8 U	1.8 U	2.6 U	20 U	20 U	20 U	2.7 U	1.8 U	2 U	2.4 U
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	12	12	7	150	14	0.91 U	1.3 U	10 U	23 I	30 I	33	21	220	330
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	--	1 U	0.92 U	0.93 U	0.91 U	0.92 U	0.91 U	1.3 U	10 U	10 U	10 U	1.3 U	0.88 U	0.99 U	1.2 U
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	1 U	0.92 U	0.93 U	0.91 U	0.92 U	0.91 U	1.3 U	10 U	10 U	10 U	1.3 U	0.88 U	0.99 U	1.2 U
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	1 U	0.92 U	0.93 U	0.91 U	0.92 U	0.91 U	1.3 U	10 U	10 U	10 U	1.3 U	0.88 U	0.99 U	1.2 U
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	1.6 I	1.3 I	0.93 U	11	0.92 U	0.91 U	1.3 U	10 U	10 U	10 U	1.3 U	0.88 U	2.3 I	1.4 I
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	6.1	5.1	1.3 I	460	26	0.91 U	1.3 U	10 U	12 I	10 U	7.3	4.5	1000	690
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	6.2	5.8	1.5 I	520	36	4.2	1.3 U	10 U	10 U	10 U	12	7.1	450	720
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	1 U	0.92 U	0.93 U	0.91 U	0.92 U	0.91 U	1.3 U	10 U	10 U	10 U	1.3 U	0.88 U	0.99 U	1.2 U
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	1.1 I	1.1 I	1.9 I	160	14	4.6	1.3 U	10 U	10 U	10 U	18	11	7.8	13
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	3.5 I	3.5 I	0.93 U	440	31	0.91 U	1.3 U	10 U	10 U	10 U	12	7.6	540	980
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	--	1 U	0.92 U	0.93 U	0.91 U	0.92 U	0.91 U	1.3 U	10 U	10 U	10 U	1.3 U	0.88 U	0.99 U	1.2 U
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	--	1 U	0.92 U	0.93 U	0.91 U	0.92 U	0.91 U	1.3 U	10 U	10 U	10 U	1.3 U	0.88 U	0.99 U	1.2 U
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	--	1 U	0.92 U	0.93 U	0.91 U	0.92 U	0.91 U	1.3 U	10 U	10 U	10 U	1.3 U	0.88 U	0.99 U	1.2 U

Table 4-3. Site Assessment DPT Analytical Results (Continued)

Location ID Date Sample Depth (ft bls)	CAS No.	Screening Criteria <sup>1,2</sup>	STP1-DPT0010						
			2/23/2022 3 - 7	2/23/2022 8 - 12	2/23/2022 14 - 18	2/23/2022 21 - 25	2/23/2022 31 - 35	2/23/2022 31 - 35*	2/23/2022 40 - 44
<b>PFAS with Screening Criteria (ng/L)</b>									
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>3</sup>	13252-13-6	6	20 U	20 U	20 U	20 U	2.4 U	1.9 U	2.4 U
Perfluoro-1-butananesulfonic acid (PFBS)	375-73-5	600	10 U	10 U	18 I	12 I	29	20	1.2 I
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	39	11 I	41	120	64	310	240	8.9
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	5.9	200	1000	760	640	30	24	7.6
Perfluoro-n-octanoic acid (PFOA)	335-67-1	6	120	1500	240	150	31	23	13
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	4	28 I	62	18 I	24 I	290	230	3.4 I
<b>PFAS without Screening Criteria (ng/L)</b>									
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	20 U	20 U	20 U	20 U	2.4 U	1.9 U	2.4 U
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	20 U	28 I	49 I	530 V	26	24	13
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	20 U	86	20 U	20 U	2.4 U	1.9 U	2.4 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	20 U	20 U	20 U	20 U	2.4 U	1.9 U	2.4 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	20 U	20 U	20 U	20 U	2.4 U	1.9 U	2.4 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	20 U	20 U	20 U	20 U	2.4 U	1.9 U	2.4 U
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	20 U	20 U	20 U	20 U	2.4 U	1.9 U	2.4 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	20 U	20 U	20 U	20 U	2.4 U	1.9 U	2.4 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	20 U	20 U	20 U	20 U	2.4 U	1.9 U	2.4 U
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	110	650	120	50	26	20	8.2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	--	10 U	10 U	10 U	10 U	1.2 U	0.93 U	1.2 U
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	10 U	10 U	10 U	10 U	1.2 U	0.93 U	1.2 U
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	10 U	10 U	10 U	10 U	1.2 U	0.93 U	1.2 U
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	10 U	10 U	10 U	10 U	8.4	7.1	1.2 U
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	240	2200	250	69	26	23	23
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	200	1300	180	44	70	49	15
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	10 U	10 U	10 U	10 U	1.2 U	0.93 U	1.2 U
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	10 U	10 U	18 I	13 I	45	29	1.2 U
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	150	1000	180	51	60	47	18
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	--	10 U	10 U	10 U	10 U	1.2 U	0.93 U	1.2 U
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	--	10 U	10 U	10 U	10 U	1.2 U	0.93 U	1.2 U
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	--	10 U	10 U	10 U	10 U	1.2 U	0.93 U	1.2 U

Table 4-3. Site Assessment DPT Analytical Results (Continued)

Location ID Date Sample Depth (ft bls)	CAS No.	Screening Criteria <sup>1,2</sup>	STP1-DPT0011							STP1-DPT0012						
			2/24/2022	2/24/2022	2/24/2022	2/24/2022	2/24/2022	2/24/2022	2/24/2022	2/24/2022	2/24/2022	2/24/2022	2/24/2022	2/24/2022	2/24/2022	
			3 - 7	8 - 12	14 - 18	21 - 25	31 - 35	40 - 44	40 - 44*	3 - 7	8 - 12	8 - 12*	14 - 18	21 - 25	31 - 35	40 - 44
<b>PFAS with Screening Criteria (ng/L)</b>																
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>3</sup>	13252-13-6	6	20 U	20 U	20 U	2.3 U	1.8 U	1.8 U	1.9 U	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	1.8 U
Perfluoro-1-butananesulfonic acid (PFBS)	375-73-5	600	10 U	10 U	39 I	37	2.9 I	1.4 I	0.93 U	10 U	10 U	10 U	0.91 U	2 I	0.92 U	1 I
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	39	10 U	10 U	10 U	2.5 I	4.3	4	3.1 I	10 U	10 U	10 U	6.5	7.4	4.2	2.5 I
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	5.9	10 U	10 U	10 U	1.1 U	0.91 U	0.9 U	0.93 U	10 U	10 U	10 U	0.91 U	0.9 U	0.92 U	0.89 U
Perfluoro-n-octanoic acid (PFOA)	335-67-1	6	10 U	10 U	10 U	3.8 I	3.7	3.7	3.9	10 U	10 U	10 U	2.6 I	2.7 I	1.9 I	4.4
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	4	10 U	10 U	10 U	7.9	26	12	12	19 I	15 I	18 I	8	1.2 I	0.92 U	2.8 I
<b>PFAS without Screening Criteria (ng/L)</b>																
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	20 U	20 U	20 U	2.3 U	1.8 U	1.8 U	1.9 U	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	1.8 U
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	20 U	390 V	20 U	1.9 U	1.8 U	1.8 U	1.9 U	20 U	20 U	52 I	1.8 U	1.8 U	1.8 U	1.8 U
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	20 U	20 U	20 U	2.3 U	1.8 U	1.8 U	1.9 U	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	1.8 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	20 U	20 U	20 U	2.3 U	1.8 U	1.8 U	1.9 U	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	1.8 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	20 U	20 U	20 U	2.3 U	1.8 U	1.8 U	1.9 U	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	1.8 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	20 U	20 U	20 U	2.3 U	1.8 U	1.8 U	1.9 U	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	1.8 U
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	20 U	20 U	20 U	2.3 U	1.8 U	1.8 U	1.9 U	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	1.8 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	20 U	20 U	20 U	2.3 U	1.8 U	1.8 U	1.9 U	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	1.8 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	20 U	20 U	20 U	2.3 U	1.8 U	1.8 U	1.9 U	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	1.8 U
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	10 U	10 U	10 U	2.6 I	8.9	5.6	5.3	11 I	12 I	12 I	9.3	6	3.5 I	4
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	--	10 U	10 U	10 U	1.1 U	0.91 U	0.9 U	0.93 U	10 U	10 U	10 U	0.91 U	0.9 U	0.92 U	0.89 U
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	10 U	10 U	10 U	1.1 U	0.91 U	0.9 U	0.93 U	10 U	10 U	10 U	0.91 U	0.9 U	0.92 U	0.89 U
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	10 U	10 U	10 U	1.1 U	0.91 U	0.9 U	0.93 U	10 U	10 U	10 U	0.91 U	0.9 U	0.92 U	0.89 U
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	10 U	10 U	10 U	1.1 U	0.91 U	0.9 U	0.93 U	10 U	10 U	10 U	0.91 U	0.9 U	0.92 U	0.89 U
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	10 U	10 U	10 U	1.2 I	1.8 I	1.5 I	1.6 I	10 U	10 U	10 U	0.91 U	0.9 U	0.92 U	1.3 I
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	10 U	10 U	10 U	1.1 U	2.5 I	2.3 I	2.4 I	10 U	10 U	10 U	1.9 I	0.9 U	0.92 U	1.3 I
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	10 U	10 U	10 U	1.1 U	0.91 U	0.9 U	0.93 U	10 U	10 U	10 U	0.91 U	0.9 U	0.92 U	0.89 U
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	10 U	10 U	10 U	1.1 U	0.91 U	0.9 U	0.93 U	10 U	10 U	10 U	0.91 U	0.9 U	0.92 U	0.89 U
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	10 U	10 U	10 U	1.1 U	2.1 I	0.9 U	2.3 I	10 U	10 U	10 U	0.91 U	0.9 U	0.92 U	0.89 U
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	--	10 U	10 U	10 U	1.1 U	0.91 U	0.9 U	0.93 U	10 U	10 U	10 U	0.91 U	0.9 U	0.92 U	0.89 U
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	--	10 U	10 U	10 U	1.1 U	0.91 U	0.9 U	0.93 U	10 U	10 U	10 U	0.91 U	0.9 U	0.92 U	0.89 U
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	--	10 U	10 U	10 U	1.1 U	0.91 U	0.9 U	0.93 U	10 U	10 U	10 U	0.91 U	0.9 U	0.92 U	0.89 U

Table 4-3. Site Assessment DPT Analytical Results (Continued)

Location ID Date Sample Depth (ft bls)	CAS No.	Screening Criteria <sup>1,2</sup>	STP1-DPT0013						STP1-DPT0014						
			2/24/2022	2/24/2022	2/24/2022	2/24/2022	2/24/2022	2/24/2022	2/25/2022	2/25/2022	2/25/2022	2/25/2022	2/25/2022	2/25/2022	
			3 - 7	8 - 12	14 - 18	21 - 25	31 - 35	40 - 44	3 - 7	8 - 12	14 - 18	21 - 25	21 - 25*	31 - 35	40 - 44
<b>PFAS with Screening Criteria (ng/L)</b>															
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>3</sup>	13252-13-6	6	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	1.9 U	1.8 U	1.8 U	1.8 U
Perfluoro-1-butananesulfonic acid (PFBS)	375-73-5	600	10 U	10 U	10 U	0.91 U	2.4 I	0.89 U	10 U	10 U	10 U	0.93 U	0.89 U	1.9 I	1.9 I
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	39	10 U	10 U	10 U	5.3	8.7	2.5 I	10 U	10 U	10 U	0.93 U	0.89 U	5.5	8.3
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	5.9	10 U	10 U	10 U	0.91 U	0.89 U	0.89 U	10 U	10 U	10 U	0.93 U	0.89 U	0.92 U	0.91 U
Perfluoro-n-octanoic acid (PFOA)	335-67-1	6	20 I	60	21 I	2.9 I	9	3 I	10 U	10 U	10 U	0.93 U	0.89 U	6.5	12
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	4	140	100	10 U	0.91 U	0.89 U	0.89 U	10 U	10 U	10 U	0.93 U	0.89 U	0.92 U	0.91 U
<b>PFAS without Screening Criteria (ng/L)</b>															
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	1.9 U	1.8 U	1.8 U	1.8 U
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	1.9 U	1.8 U	1.8 U	2.3 I
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	1.9 U	1.8 U	1.8 U	1.8 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	1.9 U	1.8 U	1.8 U	1.8 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	1.9 U	1.8 U	1.8 U	1.8 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	1.9 U	1.8 U	1.8 U	1.8 U
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	1.9 U	1.8 U	1.8 U	1.8 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	1.9 U	1.8 U	1.8 U	1.8 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	1.9 U	1.8 U	1.8 U	1.8 U
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	10 U	17 I	10 I	5.6	12	2.7 I	10 U	10 U	10 U	0.93 U	0.89 U	9.7	12
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	--	10 U	10 U	10 U	0.91 U	0.89 U	0.89 U	10 U	10 U	10 U	0.93 U	0.89 U	0.92 U	0.91 U
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	10 U	10 U	10 U	0.91 U	0.89 U	0.89 U	10 U	10 U	10 U	0.93 U	0.89 U	0.92 U	0.91 U
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	10 U	10 U	10 U	0.91 U	0.89 U	0.89 U	10 U	10 U	10 U	0.93 U	0.89 U	0.92 U	0.91 U
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	10 U	10 U	10 U	0.91 U	0.89 U	0.89 U	10 U	10 U	10 U	0.93 U	0.89 U	0.92 U	0.91 U
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	10 U	18 I	10 U	3 I	14	2.4 I	10 U	10 U	10 U	0.93 U	0.89 U	11	16
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	10 U	16 I	10 U	2.3 I	24	3.1 I	10 U	10 U	10 U	0.93 U	0.89 U	20	23
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	10 U	10 U	10 U	0.91 U	0.89 U	0.89 U	10 U	10 U	10 U	0.93 U	0.89 U	0.92 U	0.91 U
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	10 U	10 U	10 U	0.91 U	3.3 I	0.89 U	10 U	10 U	10 U	0.93 U	0.89 U	1.7 I	2.2 I
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	10 U	14 I	10 U	3.4 I	20	4.3	10 U	10 U	10 U	0.93 U	0.89 U	17	22
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	--	10 U	10 U	10 U	0.91 U	0.89 U	0.89 U	10 U	10 U	10 U	0.93 U	0.89 U	0.92 U	0.91 U
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	--	10 U	10 U	10 U	0.91 U	0.89 U	0.89 U	10 U	10 U	10 U	0.93 U	0.89 U	0.92 U	0.91 U
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	--	10 U	10 U	10 U	0.91 U	0.89 U	0.89 U	10 U	10 U	10 U	0.93 U	0.89 U	0.92 U	0.91 U



Table 4-3. Site Assessment DPT Analytical Results (Continued)

Location ID Date Sample Depth (ft bls)	CAS No.	Screening Criteria <sup>1,2</sup>	STP1-DPT0015					STP1-DPT0016					
			2/25/2022	2/25/2022	2/25/2022	2/25/2022	2/25/2022	3/14/2022	3/14/2022	3/14/2022	3/14/2022	3/14/2022	
			8 - 12	14 - 18	21 - 25	31 - 35	40 - 44	3 - 7	8 - 12	14 - 18	21 - 25	31 - 35	40 - 44
<b>PFAS with Screening Criteria (ng/L)</b>													
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>3</sup>	13252-13-6	6	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	1.8 U	1.8 U	1.8 U	1.8 U
Perfluoro-1-butananesulfonic acid (PFBS)	375-73-5	600	860	150	12	1.6 I	4.2	10 U	10 U	0.9 U	0.89 U	0.91 U	0.9 U
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	39	4600	750	110	11	16	10 U	10 U	0.9 U	0.89 U	0.91 U	0.9 U
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	5.9	18 I	19 I	1 I	0.9 U	0.9 U	10 U	10 U	0.9 U	0.89 U	0.91 U	0.9 U
Perfluoro-n-octanoic acid (PFOA)	335-67-1	6	350	200	50	4.8	8.8	10 U	10 U	0.9 U	0.89 U	0.91 U	0.9 U
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	4	1700	1500	53	7.1	17	10 U	10 U	0.9 U	0.89 U	0.91 U	0.9 U
<b>PFAS without Screening Criteria (ng/L)</b>													
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	1.8 U	1.8 U	1.8 U	1.8 U
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	45 I	110	58	1.8 U	5 I	20 U	20 U	1.8 U	1.8 U	1.8 U	1.8 U
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	1.8 U	1.8 U	1.8 U	1.8 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	1.8 U	1.8 U	1.8 U	1.8 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	1.8 U	1.8 U	1.8 U	1.8 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	1.8 U	1.8 U	1.8 U	1.8 U
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	1.8 U	1.8 U	1.8 U	1.8 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	1.8 U	1.8 U	1.8 U	1.8 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	1.8 U	1.8 U	1.8 U	1.8 U
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	280	65	12	4.3	3.2 I	10 U	10 U	0.9 U	0.89 U	0.91 U	0.9 U
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	--	10 U	10 U	0.91 U	0.9 U	0.9 U	10 U	10 U	0.9 U	0.89 U	0.91 U	0.9 U
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	10 U	10 U	0.91 U	0.9 U	0.9 U	10 U	10 U	0.9 U	0.89 U	0.91 U	0.9 U
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	10 U	10 U	0.91 U	0.9 U	0.9 U	10 U	10 U	0.9 U	0.89 U	0.91 U	0.9 U
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	77	32 I	5.3	0.9 U	0.9 U	10 U	10 U	0.9 U	0.89 U	0.91 U	0.9 U
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	490	110	19	2.7 I	2.6 I	10 U	10 U	0.9 U	0.89 U	0.91 U	0.9 U
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	1100	250	37	4.9	9	10 U	10 U	0.9 U	0.89 U	0.91 U	0.9 U
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	10 U	10 U	0.91 U	0.9 U	0.9 U	10 U	10 U	0.9 U	0.89 U	0.91 U	0.9 U
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	770	120	11	1.6 I	2.4 I	10 U	10 U	0.9 U	0.89 U	0.91 U	0.9 U
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	790	160	33	5.3	6	10 U	10 U	0.9 U	0.89 U	0.91 U	0.9 U
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	--	10 U	10 U	0.91 U	0.9 U	0.9 U	10 U	10 U	0.9 U	0.89 U	0.91 U	0.9 U
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	--	10 U	10 U	0.91 U	0.9 U	0.9 U	10 U	10 U	0.9 U	0.89 U	0.91 U	0.9 U
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	--	10 U	10 U	0.91 U	0.9 U	0.9 U	10 U	10 U	0.9 U	0.89 U	0.91 U	0.9 U

Table 4-3. Site Assessment DPT Analytical Results (Continued)

Location ID Date Sample Depth (ft bls)	CAS No.	Screening Criteria <sup>1,2</sup>	STP1-DPT0017						STP1-DPT0018							
			3/15/2022	3/15/2022	3/15/2022	3/15/2022	3/15/2022	3/15/2022	3/15/2022	3/15/2022	3/15/2022	3/15/2022	3/15/2022	3/15/2022		
			3 - 7	8 - 12	8 - 12*	14 - 18	21 - 25	31 - 35	40 - 44	3 - 7	8 - 12	14 - 18	21 - 25	21 - 25*	31 - 35	40 - 44
<b>PFAS with Screening Criteria (ng/L)</b>																
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>3</sup>	13252-13-6	6	20 U	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	1.8 U	1.8 U	2.3 U	1.8 U
Perfluoro-1-butananesulfonic acid (PFBS)	375-73-5	600	10 U	10 U	10 U	10 U	9.3	25	12	10 U	10 U	10 U	1.8 I	1.7 I	1.2 U	0.9 U
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	39	10 U	10 U	10 U	10 U	78	140	150	10 U	10 U	10 I	24	25	2.3 I	0.9 U
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	5.9	10 U	10 U	10 U	10 U	1.9 I	0.9 U	0.9 U	10 U	10 U	10 U	0.89 U	0.91 U	1.2 U	0.9 U
Perfluoro-n-octanoic acid (PFOA)	335-67-1	6	10 U	10 U	10 U	10 U	9.9	6.4	7.6	10 U	10 U	10 U	8.9	10	2.1 I	0.9 U
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	4	18 I	20 I	17 I	11 I	110	11	17	10 U	10 U	23 I	24	26	2.4 I	0.9 U
<b>PFAS without Screening Criteria (ng/L)</b>																
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	20 U	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	1.8 U	1.8 U	2.3 U	1.8 U
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	20 U	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	1.8 U	1.8 U	2.3 U	1.8 U
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	20 U	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	1.8 U	1.8 U	2.3 U	1.8 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	20 U	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	1.8 U	1.8 U	2.3 U	1.8 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	20 U	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	1.8 U	1.8 U	2.3 U	1.8 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	20 U	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	1.8 U	1.8 U	2.3 U	1.8 U
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	20 U	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	1.8 U	1.8 U	2.3 U	1.8 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	20 U	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	1.8 U	1.8 U	2.3 U	1.8 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	20 U	20 U	20 U	20 U	1.8 U	1.8 U	1.8 U	20 U	20 U	20 U	1.8 U	1.8 U	2.3 U	1.8 U
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	18 I	12 I	13 I	13 I	17	21	4.2	10 U	10 U	10 U	5.5	6	1.2 U	0.9 U
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	--	10 U	10 U	10 U	10 U	0.9 U	0.9 U	0.9 U	10 U	10 U	10 U	0.89 U	0.91 U	1.2 U	0.9 U
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	10 U	10 U	10 U	10 U	0.9 U	0.9 U	0.9 U	10 U	10 U	10 U	0.89 U	0.91 U	1.2 U	0.9 U
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	10 U	10 U	10 U	10 U	0.9 U	0.9 U	0.9 U	10 U	10 U	10 U	0.89 U	0.91 U	1.2 U	0.9 U
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	10 U	10 U	10 U	10 U	1.8 I	0.9 U	2 I	10 U	10 U	10 U	1 I	1 I	1.2 U	0.9 U
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	10 U	10 U	10 U	10 U	7.7	16	2.8 I	10 U	10 U	10 U	3.6	3.6	1.2 U	0.9 U
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	10 U	10 U	10 U	10 U	12	35	12	10 U	10 U	10 U	4.6	5.1	1.2 U	0.9 U
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	10 U	10 U	10 U	10 U	0.9 U	0.9 U	0.9 U	10 U	10 U	10 U	0.89 U	0.91 U	1.2 U	0.9 U
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	10 U	10 U	10 U	10 U	9.1	25	15	10 U	10 U	10 U	1.6 I	1.5 I	1.2 U	0.9 U
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	10 U	10 U	10 U	10 U	11	35	5.1	10 U	10 U	10 U	3.6	3.9	1.2 U	0.9 U
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	--	10 U	10 U	10 U	10 U	0.9 U	0.9 U	0.9 U	10 U	10 U	10 U	0.89 U	0.91 U	1.2 U	0.9 U
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	--	10 U	10 U	10 U	10 U	0.9 U	0.9 U	0.9 U	10 U	10 U	10 U	0.89 U	0.91 U	1.2 U	0.9 U
Perfluoro-n-undecanoic acid (PFUDA)	2058-94-8	--	10 U	10 U	10 U	10 U	0.9 U	0.9 U	0.9 U	10 U	10 U	10 U	0.89 U	0.91 U	1.2 U	0.9 U

All results reported in nanogram per liter (ng/L)

1 The USEPA Regional Screening Levels (RSLs) for HFPO-DA, PFBS, PFHxS, PFNA, PFOA, and PFOS are presented in this table.

2 The Groundwater RSL is cited from the USEPA Regional Screening Levels and calculated with the USEPA RSL Calculator based on a hazard quotient of 0.1 (USEPA, 2022)

3 HFPO-DA is commonly referred to as GenX

\* Duplicate sample results are included in this table and labeled with asterisk; other Quality Control/Quality Assurance sample results are included in the laboratory reports (Appendix C) and Table 4-9

-- = No applicable screening criteria

Bolding indicates analyte was detected

Shading indicates exceedance of screening criteria

STP1 = Sewage Treatment Plant #1

USEPA = United States Environmental Protection Agency

ft bls = feet below land surface

PFAS = per- and polyfluoroalkyl substances

B = Analyte was detected in the Method Blank

D = Results reported from a dilution

I = Estimated result < Limit of Quantitation and ≥ Detection Limit

J = Estimated value

L = Laboratory Control Spike/Duplicate out of control limits

Q = Out of holding time

S = Matrix Spike/Duplicate out of control limits

U = Analyte was not detected

Note: A data quality review was performed by Tetra Tech's data manager and the results provided in this table were found to have been generated in conformance with good analytical practices. Some minor nonconformance issues were noted in the quality control elements associated with project samples, and the appropriate data qualification was applied to the affected results as needed. Per the FDEP reporting convention described in Chapter 62-160, F.A.C., non-detect values are reported to the method detection limit. Additional details on data quality are included in the analytical reports provided in the Appendices.

Table 4-4. Site Assessment DPT Groundwater Frequencies of Detection

Parameter	CAS No.	Screening Criteria <sup>1,2</sup>	Method DoD QSM 5.3						
			No. of Samples <sup>3</sup>	No. of Detections	Minimum Concentration (ng/L)	Maximum Concentration (ng/L)	Location with Maximum Concentration	Average Concentration (Detections Only)	No. Samples > Screening Level
<b>PFAS with Screening Criteria (ng/L)</b>									
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>4</sup>	13252-13-6	6	131	0	NA	NA	NA	NA	NA
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	600	131	70	1.0	860	STP1-DPT0015-010.0-20220225	42.4	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	39	131	95	0.95	4,600	STP1-DPT0015-010.0-20220225	198	54
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	5.9	131	42	1.0	1,000	STP1-DPT0010-010.0-20220223	116	26
Perfluoro-n-octanoic acid (PFOA)	335-67-1	6	131	92	1.0	19,000	SW3-DPT0132-022.0-20211102	387	72
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	4	131	84	0.92	1,700	STP1-DPT0015-010.0-20220225	227	73
<b>PFAS without Screening Criteria (ng/L)</b>									
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	131	13	4.2	7,700	SW3-DPT0132-022.0-20211102	654	NA
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	131	53	1.7	730,000	SW3-DPT0132-022.0-20211102	14,648	NA
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	131	18	2.2	86	STP1-DPT0010-010.0-20220223	11	NA
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	131	0	NA	NA	NA	NA	NA
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	131	0	NA	NA	NA	NA	NA
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	131	0	NA	NA	NA	NA	NA
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	131	0	NA	NA	NA	NA	NA
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	131	3	2.9	6	STP1-DPT0004-016.0-20220221	3.7	NA
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	131	0	NA	NA	NA	NA	NA
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	131	98	1.3	15,000	SW3-DPT0132-022.0-20211102	330	NA
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	--	131	0	NA	NA	NA	NA	NA
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	131	11	1.1	7	SW3-DPT0131-012.0-20211102	2.1	NA
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	131	0	NA	NA	NA	NA	NA
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	131	39	1.0	77	STP1-DPT0015-010.0-20220225	11	NA
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	131	81	1.2	20,000	SW3-DPT0132-022.0-20211102	633	NA
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	131	85	1.3	38,000	SW3-DPT0132-022.0-20211102	911	NA
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	131	1	16	1.6	POL-DPT1474-032.0-20211026	1.6	NA
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	131	66	0.98	770	STP1-DPT0015-010.0-20220225	40	NA
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	131	79	1.3	62,000	SW3-DPT0132-022.0-20211102	1,491	NA
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	--	131	0	NA	NA	NA	NA	NA
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	--	131	0	NA	NA	NA	NA	NA
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	--	131	0	NA	NA	NA	NA	NA

All results reported in nanogram per liter (ng/L)

1 The USEPA Regional Screening Levels (RSLs) for HFPO-DA, PFBS, PFHxS, PFNA, PFOA, and PFOS are presented in this table.

2 The Groundwater RSL is cited from the USEPA Regional Screening Levels and calculated with the USEPA RSL Calculator based on a hazard quotient of 0.1 (USEPA, 2022)

3 QA/QC samples are not included in the dataset.

4 HFPO-DA is commonly referred to as GenX

-- = No applicable screening criteria

STP1 = Sewage Treatment Plant #1

USEPA = United States Environmental Protection Agency

NA = Not Applicable; not detected or no applicable screening criteria

PFAS = per- and polyfluoroalkyl substances

Table 4-5. Site Assessment Monitoring Well Analytical Results

Location ID	CAS No.	Screening Criteria <sup>1,2</sup>	POL-MW0008S	POL-MW0008I	POL-MW0011S		POL-MW0011I		POL-MW0036SI	POL-MW0036I	POL-MW0041SI
			4/21/2020	4/21/2020	4/23/2020	8/26/2021	4/23/2020	8/26/2021	4/21/2020	4/21/2020	4/21/2020
Screen Interval (ft bls)			5 - 10	25 - 30	25 - 30		25 - 30		18 - 23	25 - 30	18 - 23
<b>PFAS with Screening Criteria (ng/L)</b>											
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>3</sup>	13252-13-6	6	0.23 U	0.22 U	0.23 U	0.443 U	0.23 U	0.496 U	0.23 U	0.24 U	0.23 U
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	600	0.69 I	1.69 I	8.25	4.61	6.19	3.08 I	7.74	2.88 I	2.46 I
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	39	4.55 I	5.35	61.65	102	49.48	111	51.77	10.25	10.18
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	5.9	0.6 I	0.27 U	0.29 U	0.887 U	0.29 U	0.992 U	0.29 U	0.29 U	1.37 I
Perfluoro-n-octanoic acid (PFOA)	335-67-1	6	4.3 I	2.36 I	4.86	23.7	19.91	30.5	15.98	3.3 I	16.18
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	4	20.47	1.15 I	16.66	72.2	1.84 I	18.9	2.15 I	1.98 I	56.85
<b>PFAS without Screening Criteria (ng/L)</b>											
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	0.25 U	0.24 U	0.25 U	0.887 U	0.25 U	0.992 U	0.25 U	0.25 U	0.25 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	0.21 U	0.2 U	0.21 U	0.443 U	0.21 U	0.496 U	0.21 U	0.22 U	0.21 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	0.25 U	0.24 U	0.25 U	0.887 U	0.25 U	0.992 U	0.25 U	0.25 U	0.25 U
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	0.45 U	0.44 U	0.46 U	0.887 U	0.46 U	0.992 U	0.46 U	0.47 U	0.45 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	0.32 U	0.31 U	0.32 U	0.887 U	0.32 U	0.992 U	0.32 U	0.33 U	0.32 U
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	0.13 U	0.12 U	0.13 U	0.443 U	0.13 U	0.496 U	0.13 U	0.13 U	0.13 U
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	0.17 U	0.17 U	0.18 U	0.443 U	0.18 U	0.496 U	0.18 U	0.18 U	0.17 U
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	0.24 U	0.23 U	9.87	3.94 I	10.3	16.4	11.73	4.35 I	0.24 U
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	3.61 I	2 I	30.63	4.53	18.1	21.2	14.46	5.51	0.48 U
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane sulfonamide (PFOSA)	754-91-6	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoro-n-tetradecanoic acid (PFTrDA)	376-06-7	--	0.66 U	0.64 U	0.68 U	1.77 U	0.68 U	1.98 U	0.68 U	0.69 U	0.66 U
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	--	0.14 U	0.13 U	0.14 U	0.443 U	0.14 U	0.496 U	0.14 U	0.14 U	0.14 U
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	--	0.2 U	0.19 U	0.2 U	0.443 U	0.2 U	0.496 U	0.2 U	0.21 U	0.2 U

Table 4-5. Site Assessment Monitoring Well Analytical Results (Continued)

Location ID	CAS No.	Screening Criteria <sup>1,2</sup>	POL-MW0043S	POL-MW0043I	POL-MW0043D	POL-MW0044I	POL-MW0044D	POL-MW0045S	POL-MW0045I	POL-MW0045D	POL-MW0046D
Date			4/22/2020	4/23/2020	4/23/2020	4/23/2020	4/23/2020	4/22/2020	4/22/2020	4/22/2020	4/22/2020
Screen Interval (ft bls)			10 - 20	20 - 30	30 - 40	20 - 30	30 - 40	10 - 20	20 - 30	30 - 40	30 - 40
<b>PFAS with Screening Criteria (ng/L)</b>											
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>3</sup>	13252-13-6	6	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.24 U	0.23 U	0.23 U
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	600	3.24 I	4.86	1.68 I	4.45 I	1.85 I	323.79	112.09	2.67 I	8.21
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	39	33.79	67.14	4.87	28.93	7.61	153.51 D	127.27	5.66	157.56 D
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	5.9	4.06 I	0.29 U	0.29 U	1.45 I	0.29 U	12.9	5.78	0.28 U	0.28 U
Perfluoro-n-octanoic acid (PFOA)	335-67-1	6	26.57	22.01	0.47 U	42.59	1.42 I	45.01	47.98	1.39 I	31.81
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	4	325.77 D	17.73	0.41 U	75.33	0.41 U	853.44 D	266.5 D	0.4 U	10.19
<b>PFAS without Screening Criteria (ng/L)</b>											
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.26 U	0.25 U	0.25 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.22 U	0.21 U	0.21 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.26 U	0.25 U	0.25 U
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	0.46 U	0.46 U	0.46 U	0.46 U	0.46 U	4.92	0.48 U	0.55 I	0.45 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.32 U	0.34 U	0.32 U	0.32 U
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	1.33 I	0.13 U	0.13 U	0.13 U	0.13 U	6.32	0.13 U	0.13 U	0.13 U
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.18 U	0.17 U	0.17 U
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	6.01	5.7	1.16 I	8.95	1.96 I	29.91	16.87	1.49 I	18.72
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	7.68	6.41	3.48 I	7.81	4.4 I	394.06	127.21	3.01 I	38.36
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane sulfonamide (PFOSA)	754-91-6	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	--	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.7 U	0.66 U	0.66 U
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	--	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U	0.14 U
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.21 U	0.2 U	0.2 U

Table 4-5. Site Assessment Monitoring Well Analytical Results (Continued)

Location ID	CAS No.	Screening Criteria <sup>1,2</sup>	POL-MW0046DD	POL-MW0047I	POL-MW0047D	POL-MW0047DD	SW3-MW0027	SW3-MW0028
Date			4/22/2020	4/22/2020	4/22/2020	4/22/2020	4/23/2020	4/23/2020
Screen Interval (ft bls)			40 - 50	20 - 30	30 - 40	40 - 50	27 - 37	27 - 37
<b>PFAS with Screening Criteria (ng/L)</b>								
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>3</sup>	13252-13-6	6	0.23 U	0.23 U	0.23 U	0.23 U	0.22 U	0.22 U
Perfluoro-1-butananesulfonic acid (PFBS)	375-73-5	600	1.59 I	11.26	10.34	2.25 I	2.28 I	3.82 I
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	39	19.16	87.36	162.87 D	19.7	13.63	4.79
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	5.9	0.28 U	0.29 U	0.29 U	0.28 U	0.28 U	0.28 U
Perfluoro-n-octanoic acid (PFOA)	335-67-1	6	2.65 I	25.73	26.98	1.25 I	22.28	6.21
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	4	0.4 U	7.68	7.51	0.4 U	0.39 U	0.39 U
<b>PFAS without Screening Criteria (ng/L)</b>								
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	NA	NA	NA	NA	NA	NA
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	NA	NA	NA	NA	NA	NA
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	NA	NA	NA	NA	NA	NA
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	0.25 U	0.25 U	0.25 U	0.25 U	0.24 U	0.24 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	0.25 U	0.25 U	0.25 U	0.25 U	0.24 U	0.24 U
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	NA	NA	NA	NA	NA	NA
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	0.45 U	9.99	0.46 U	0.45 U	0.45 U	0.45 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	0.32 U	0.92 I	0.32 U	0.32 U	0.31 U	0.31 U
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	NA	NA	NA	NA	NA	NA
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	--	NA	NA	NA	NA	NA	NA
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	0.17 U	0.18 U	0.18 U	0.17 U	0.17 U	0.17 U
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	NA	NA	NA	NA	NA	NA
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	1.79 I	19.06	20.38	1.3 I	22.33	11.83
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	4.32 I	49.22	52.19	5.13	21.58	15.54
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	NA	NA	NA	NA	NA	NA
Perfluorooctane sulfonamide (PFOSA)	754-91-6	--	NA	NA	NA	NA	NA	NA
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	NA	NA	NA	NA	NA	NA
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	NA	NA	NA	NA	NA	NA
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	--	0.66 U	0.68 U	0.68 U	0.66 U	0.65 U	0.65 U
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	--	0.14 U	0.14 U	0.14 U	0.14 U	0.13 U	0.13 U
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

All results reported in nanogram per liter (ng/L)

1 The USEPA Regional Screening Levels (RSLs) for HFPO-DA, PFBS, PFHxS, PFNA, PFOA, and PFOS are presented in this table.

2 The Groundwater RSL is cited from the EPA Regional Screening Levels and calculated with the USEPA RSL Calculator based on a hazard quotient of 0.1 (USEPA, 2022)

3 HFPO-DA is commonly referred to as GenX

-- = No applicable screening criteria

Bolding indicates analyte was detected

Shading indicates exceedance of screening criteria

STP1 = Sewage Treatment Plant #1

USEPA = United States Environmental Protection Agency

ft bls = feet below land surface

NA = Not Applicable; compound not analyzed

PFAS = per- and polyfluoroalkyl substances

D = Result reported from a dilution

I = Estimated result < Limit of Quantitation and ≥ Detection Limit

U = Analyte was not detected

Note: A data quality review was performed by Tetra Tech's data manager and the results provided in this table were found to have been generated in conformance with good analytical practices. Some minor nonconformance issues were noted in the quality control elements associated with project samples, and the appropriate data qualification was applied to the affected results as needed. Per the FDEP reporting convention described in Chapter 62-160, F.A.C., non-detect values are reported to the method detection limit. Additional details on data quality are included in the analytical reports provided in the Appendices.

Table 4-6. Site Assessment Monitoring Well Groundwater Frequencies of Detection

Parameter	CAS No.	Screening Criteria <sup>1,2</sup>	Method DoD QSM 5.3						
			No. of Samples <sup>3</sup>	No. of Detections	Minimum Concentration (ng/L)	Maximum Concentration (ng/L)	Location with Maximum Concentration	Average Concentration (Detections Only)	No. Samples > Screening Level
<b>PFAS with Screening Criteria (ng/L)</b>									
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>4</sup>	13252-13-6	6	24	0	NA	NA	NA	NA	NA
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	600	24	24	0.69	323.79	POL-MW0045S-015.0-20200422	22.0	0
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	39	24	24	4.6	162.87	POL-MW0047D-035.0-20200422	54.0	11
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	5.9	24	6	0.60	12.90	POL-MW0045S-015.0-20200422	4.0	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	6	24	23	1.25	47.98	POL-MW0045I-025.0-20200422	18.0	15
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	4	24	17	1.15	853.44	POL-MW0045S-015.0-20200422	103.31	13
<b>PFAS without Screening Criteria (ng/L)</b>									
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	NA	NA	NA	NA	NA	NA	NA
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	NA	NA	NA	NA	NA	NA	NA
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	NA	NA	NA	NA	NA	NA	NA
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	24	0	NA	NA	NA	NA	NA
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	24	0	NA	NA	NA	NA	NA
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	24	0	NA	NA	NA	NA	NA
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	NA	NA	NA	NA	NA	NA	NA
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	24	3	0.55	9.99	POL-MW0047I-025.0-20200422	5.15	NA
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	24	1	0.92	0.92	POL-MW0047I-025.0-20200422	0.92	NA
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	NA	NA	NA	NA	NA	NA	NA
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	--	NA	NA	NA	NA	NA	NA	NA
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	24	2	1.3	6	POL-MW0045S-015.0-20200422	11	NA
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	24	0	NA	NA	NA	NA	NA
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	NA	NA	NA	NA	NA	NA	NA
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	24	21	1.16	29.91	POL-MW0045S-015.0-20200422	10.67	NA
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	24	23	2.0	394.06	POL-MW0045S-015.0-20200422	36.54	NA
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	NA	NA	NA	NA	NA	NA	NA
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	NA	NA	NA	NA	NA	NA	NA
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	NA	NA	NA	NA	NA	NA	NA
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	--	24	0	NA	NA	NA	NA	NA
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	--	24	0	NA	NA	NA	NA	NA
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	--	24	0	NA	NA	NA	NA	NA

All results reported in nanogram per liter (ng/L)

1 The USEPA Regional Screening Levels (RSLs) for HFPO-DA, PFBS, PFHxS, PFNA, PFOA, and PFOS are presented in this table

2 The Groundwater RSL is cited from the USEPA Regional Screening Levels and calculated with the USEPA RSL Calculator based on a hazard quotient of 0.1 (USEPA, 2022)

3 QA/QC samples are not included in the data set

4 HFPO-DA is commonly referred to as GenX

-- = No applicable screening criteria

USEPA = United States Environmental Protection Agency

NA = Not Applicable; not analyzed, not detected, or no applicable screening criteria

PFAS = per- and polyfluoroalkyl substances



Table 4-7. Site Assessment Surface Water Analytical Results

Location ID (STP1-)	CAS	Screening Criteria <sup>1</sup>	SW0001	SW0002	SW0003	SW0004	SW0005	SW0006		SW0007	SW0008
Date			3/8/2022	3/9/2022	3/9/2022	3/9/2022	3/9/2022	3/9/2022	3/9/2022	3/9/2022	3/9/2022
Sample Depth (ft bls)			0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5	0 - 0.5*	0 - 0.5	0 - 0.5
<b>PFAS with Screening Criteria (ng/L)</b>											
Perfluoro-n-octanoic acid (PFOA)	335-67-1	500	5.9	9.7	23	22	43	21	19	26	10
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	10	120	150	180	190	210	140	140	210	120
<b>PFAS without Screening Criteria (ng/L)</b>											
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	1.8 U	1.8 U	1.8 U	1.9 U	3.2 I	1.8 U	1.8 U	1.8 U	1.7 U
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	2.1 I	1.8 U	64	47	64	2.5 I	1.8 U	25	20
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.7 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.7 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.7 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.7 U
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>2</sup>	13252-13-6	--	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.7 U
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.7 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.7 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	1.8 U	1.8 U	1.8 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.7 U
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	6.2	13	19	17	32	19	18	23	11
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	--	2.7 I	9.4	9.3	11	23	16	15	18	3.8
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	--	0.88 U	0.9 U	0.89 U	0.93 U	0.94 U	0.92 U	0.89 U	0.88 U	0.87 U
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	0.88 U	0.9 U	0.89 U	0.93 U	0.94 U	0.92 U	0.89 U	0.88 U	0.87 U
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	0.88 U	0.9 U	0.89 U	0.93 U	0.94 U	0.92 U	0.89 U	0.88 U	0.87 U
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	1.4 I	2.8 I	3.5	4.1	6	3.1 I	2.9 I	4	1.5 I
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	3.9	8.6	20	21	43	24	23	29	9.3
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	6.7	18	35	37	77	47	41	55	16
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	--	32	95	100	110	180	130	120	140	56
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	--	1.3 I	1.7 I	2.3 I	2.5 I	2.6 I	2.2 I	2.2 I	3 I	2.3 I
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	0.88 U	0.90 U	0.89 U	0.93 U	0.94 U	0.92 U	0.89 U	0.88 U	0.87 U
Perfluorooctane sulfonamide (PFOSA)	754-91-6	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	2.9 I	11	11	12	25	18	15	19	4.4
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	6.9	19	45	42	100	50	45	68	18
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	--	0.88 U	0.9 U	0.89 U	0.93 U	0.94 U	0.92 U	0.89 U	0.88 U	0.87 U
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	--	0.88 U	0.9 U	0.89 U	0.93 U	0.94 U	0.92 U	0.89 U	0.88 U	0.87 U
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	--	0.88 U	0.9 U	0.89 U	0.93 U	0.94 U	0.92 U	0.89 U	0.88 U	0.87 U

Table 4-7. Site Assessment Surface Water Analytical Results (Continued)

Location ID (STP1-)	CAS	Screening Criteria <sup>1</sup>	SW0009	SW0010		SW0011
Date			3/9/2022	3/10/2022	3/10/2022	3/10/2022
Sample Depth (ft bls)			0 - 0.5	0 - 0.5	0 - 0.5*	0 - 0.5
<b>PFAS with Screening Criteria (ng/L)</b>						
Perfluoro-n-octanoic acid (PFOA)	335-67-1	500	23	4.6	4.2	58
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	10	310	9.4	8.7	1200
<b>PFAS without Screening Criteria (ng/L)</b>						
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	1.9 U	1.8 U	1.7 U	1.8 U
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	10 V	1.8 U	1.7 U	87 V
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	1.9 U	1.8 U	1.7 U	9.8
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	1.9 U	1.8 U	1.7 U	1.8 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	1.9 U	1.8 U	1.7 U	1.8 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	1.9 U	1.8 U	1.7 U	1.8 U
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>2</sup>	13252-13-6	--	1.9 U	1.8 U	1.7 U	1.8 U
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	1.9 U	1.8 U	1.7 U	1.8 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	1.9 U	1.8 U	1.7 U	1.8 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	1.9 U	1.8 U	1.7 U	1.8 U
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	17	6.7	6.4	26
Perfluoro-1-butanefluoronic acid (PFBS)	375-73-5	--	5.8	2 I	1.7 I	13
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	--	0.94 U	0.91 U	0.85 U	0.91 U
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	0.94 U	0.91 U	0.85 U	3 I
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	0.94 U	0.91 U	0.85 U	0.91 U
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	3.1 I	0.91 U	0.85 U	11
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	20	2.2 I	2.3 I	46
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	35	3.7	4.4	76
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	--	120	12	13	340
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	--	5.1	0.91 U	0.85 U	20
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	0.94 U	0.91 U	0.85 U	1.4 I
Perfluorooctane sulfonamide (PFOSA)	754-91-6	--	NA	NA	NA	NA
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	8.4	1.2 I	1.1 I	23
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	43	3.7	4	87
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	--	0.94 U	0.91 U	0.85 U	0.91 U
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	--	0.94 U	0.91 U	0.85 U	0.91 U
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	--	0.94 U	0.91 U	0.85 U	0.91 U

All results reported in nanogram per liter (ng/L)

1 The State of Florida human health Surface Water Screening Levels for PFOA and PFOS are presented in this table.

2 HFPO-DA is commonly referred to as GenX

\* Duplicate sample results are included in this table and labeled with asterisk

-- = No applicable screening criteria

Bolding indicates analyte was detected

Shading indicates exceedance of screening criteria

STP1 = Sewage Treatment Plant #1

ft bls = feet below land surface

NA = Not Applicable; compound not analyzed

PFAS = per- and polyfluoroalkyl substances

I = Estimated result < Limit of Quantitation and ≥ Detection Limit

U = Analyte was not detected

V = Analyte detected in the method blank

Note: A data quality review was performed by Tetra Tech's data manager and the results provided in this table were found to have been generated in conformance with good analytical practices. Some minor nonconformance issues were noted in the quality control elements associated with project samples, and the appropriate data qualification was applied to the affected results as needed. Per the FDEP reporting convention in Chapter 62-160, F.A.C., non-detect values are reported to the method detection limit. Additional details on data quality are included in the analytical reports provided in the Appendices.

Table 4-8. Site Assessment Surface Water Frequencies of Detection

Parameter	CAS No.	Screening Criteria <sup>1</sup>	Method DoD QSM 5.3						
			No. of Samples <sup>2</sup>	No. of Detections	Minimum Concentration (ng/L)	Maximum Concentration (ng/L)	Location with Maximum Concentration	Average Concentration (Detections Only)	No. Samples > Screening Level
<b>PFAS with Screening Criteria (ng/L)</b>									
Perfluoro-n-octanoic acid (PFOA)	335-67-1	500	11	11	4.6	58	STP1-SW0011-000.5-20220310	21	0
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	10	11	11	9.4	1200	STP1-SW0011-000.5-20220310	258	10
<b>PFAS without Screening Criteria (ng/L)</b>									
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	11	1	3.2	3.2	STP1-SW0005-000.5-20220309	3.2	NA
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	11	9	2.1	87	STP1-SW0011-000.5-20220310	36	NA
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	11	1	9.8	9.8	STP1-SW0011-000.5-20220310	9.8	NA
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	11	0	NA	NA	NA	NA	NA
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	11	0	NA	NA	NA	NA	NA
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	11	0	NA	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>3</sup>	13252-13-6	--	11	0	NA	NA	NA	NA	NA
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	11	0	NA	NA	NA	NA	NA
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	11	0	NA	NA	NA	NA	NA
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	11	0	NA	NA	NA	NA	NA
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	11	11	6.2	32	STP1-SW0005-000.5-20220309	17	NA
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	--	11	11	2	23	STP1-SW0005-000.5-20220309	10	NA
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	--	11	0	NA	NA	NA	NA	NA
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	11	1	3	3.0	STP1-SW0011-000.5-20220310	3	NA
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	11	0	NA	NA	NA	NA	NA
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	11	10	1.4	11	STP1-SW0011-000.5-20220310	4	NA
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	11	11	2.2	46	STP1-SW0011-000.5-20220310	21	NA
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	11	11	3.7	77	STP1-SW0005-000.5-20220309	37	NA
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	--	11	11	12.0	340	STP1-SW0011-000.5-20220310	120	NA
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	--	11	11	1.3	20	STP1-SW0011-000.5-20220310	4	NA
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	11	1	1.4	1.4	STP1-SW0011-000.5-20220310	1.4	NA
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	11	11	1.2	25	STP1-SW0005-000.5-20220309	12	NA
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	11	15	3.7	100	STP1-SW0005-000.5-20220309	37.4	NA
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	--	11	0	NA	NA	NA	NA	NA
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	--	11	0	NA	NA	NA	NA	NA
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	--	11	0	NA	NA	NA	NA	NA

All results reported in nanogram per liter (ng/L)

<sup>1</sup> The State of Florida human health Surface Water Screening Levels for PFOA and PFOS are presented in this table.

<sup>2</sup> QA/QC samples are not included in the dataset.

<sup>3</sup> HFPO-DA is commonly referred to as GenX

-- = No applicable screening criteria

STP1 = Sewage Treatment Plant #1

NA = Not Applicable; not analyzed, not detected, or no applicable screening criteria

PFAS = per- and polyfluoroalkyl substances

Table 4-9. Site Assessment Field QA/QC Analytical Results

Sample ID	CAS	Screening Criteria <sup>1,2</sup>	STP1-RB02- 20211209	STP1-FB02- 20211210	STP1-EB- 20220217-01	STP1-EB- 20220221-01	STP1-FB- 20220221-01	STP1-EB- 20220222-01	STP1-EB- 20220222-02	STP1-FB- 20220222-01	STP1-EB- 20220223-01
Date			12/9/2021	12/10/2021	2/17/2022	2/21/2022	2/21/2022	2/22/2022	2/22/2022	2/22/2022	2/23/2022
Sample Depth (ft bls)			-	-	-	-	-	-	-	-	-
Type			EB	FB	EB	EB	FB	EB	EB	FB	EB
<b>PFAS with Screening Criteria (ng/L)</b>											
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>3</sup>	13252-13-6	6	2 U	1.8 U	2 U	1.9 U	2 U	1.9 U	1.8 U	1.8 U	1.8 U
Perfluoro-1-butanefulfonic acid (PFBS)	375-73-5	600	1 U	0.92 U	0.98 U	0.93 U	0.99 U	0.93 U	0.88 U	0.89 U	0.92 U
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	39	1 U	0.92 U	0.98 U	0.93 U	0.99 U	0.93 U	0.88 U	0.89 U	0.92 U
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	5.9	1 U	0.92 U	0.98 U	0.93 U	0.99 U	0.93 U	0.88 U	0.89 U	0.92 U
Perfluoro-n-octanoic acid (PFOA)	335-67-1	6	1 U	0.92 U	0.98 U	0.93 U	0.99 U	0.93 U	0.88 U	0.89 U	0.92 U
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	4	1 U	0.92 U	0.98 U	0.93 U	0.99 U	0.93 U	0.88 U	0.89 U	0.92 U
<b>PFAS without Screening Criteria (ng/L)</b>											
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	--	2 U	1.8 U	2 U	1.9 U	2 U	1.9 U	1.8 U	1.8 U	1.8 U
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	--	2 U	1.8 U	2 U	1.9 U	2 U	1.9 U	1.8 U	1.8 U	1.8 IV
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	--	2 U	1.8 U	2 U	1.9 U	2 U	1.9 U	1.8 U	1.8 U	1.8 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	756426-58-1	--	2 U	1.8 U	2 U	1.9 U	2 U	1.9 U	1.8 U	1.8 U	1.8 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	763051-92-9	--	2 U	1.8 U	2 U	1.9 U	2 U	1.9 U	1.8 U	1.8 U	1.8 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	2 U	1.8 U	2 U	1.9 U	2 U	1.9 U	1.8 U	1.8 U	1.8 U
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	--	2 U	1.8 U	2 U	1.9 U	2 U	1.9 U	1.8 U	1.8 U	1.8 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	2 U	1.8 U	2 U	1.9 U	2 U	1.9 U	1.8 U	1.8 U	1.8 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	2 U	1.8 U	2 U	1.9 U	2 U	1.9 U	1.8 U	1.8 U	1.8 U
Perfluoro-n-butanoic acid (PFBA)	375-22-4	--	1 U	0.92 U	0.98 U	0.93 U	0.99 U	0.93 U	0.88 U	0.89 U	0.92 U
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	--	1 U	0.92 U	0.98 U	0.93 U	0.99 U	0.93 U	0.88 U	0.89 U	0.92 U
Perfluoro-n-decanoic acid (PFDA)	335-76-2	--	1 U	0.92 U	0.98 U	0.93 U	0.99 U	0.93 U	0.88 U	0.89 U	0.92 U
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	--	1 U	0.92 U	0.98 U	0.93 U	0.99 U	0.93 U	0.88 U	0.89 U	0.92 U
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	--	1 U	0.92 U	0.98 U	0.93 U	0.99 U	0.93 U	0.88 U	0.89 U	0.92 U
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	--	1 U	0.92 U	0.98 U	0.93 U	0.99 U	0.93 U	0.88 U	0.89 U	0.92 U
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	--	1 U	0.92 U	0.98 U	0.93 U	0.99 U	0.93 U	0.88 U	0.89 U	0.92 U
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	--	1 U	0.92 U	0.98 U	0.93 U	0.99 U	0.93 U	0.88 U	0.89 U	0.92 U
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	--	1 U	0.92 U	0.98 U	0.93 U	0.99 U	0.93 U	0.88 U	0.89 U	0.92 U
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	--	1 U	0.92 U	0.98 U	0.93 U	0.99 U	0.93 U	0.88 U	0.89 U	0.92 U
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	--	1 U	0.92 U	0.98 U	0.93 U	0.99 U	0.93 U	0.88 U	0.89 U	0.92 U
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	--	1 U	0.92 U	0.98 U	0.93 U	0.99 U	0.93 U	0.88 U	0.89 U	0.92 U
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	--	1 U	0.92 U	0.98 U	0.93 U	0.99 U	0.93 U	0.88 U	0.89 U	0.92 U

Table 4-9. Site Assessment Field QA/QC Analytical Results (Continued)

Sample ID	STP1-EB-20220223-02	STP1-FB-20220223-01	STP1-EB-20220224-01	STP1-EB-20220224-02	STP1-FB-20220224-01	STP1-FB-20220224-02	STP1-EB-20220225-01	STP1-FB-20220225	STP1-EB-20220309-01	STP1-EB-20220310-01	STP1-FB-20220310-01
Date	2/23/2022	2/23/2022	2/24/2022	2/24/2022	2/24/2022	2/24/2022	2/25/2022	2/25/2022	3/9/2022	3/10/2022	3/10/2022
Sample Depth (ft bls)	-	-	-	-	-	-	-	-	-	-	-
Type	EB	FB	EB	EB	FB	FB	EB	FB	EB	EB	FB
<b>PFAS with Screening Criteria (ng/L)</b>											
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>3</sup>	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	2 U	1.9 U	1.8 U
Perfluoro-1-butanefulfonic acid (PFBS)	0.95 U	0.9 U	0.92 U	0.9 U	0.92 U	0.89 U	0.92 U	0.91 U	0.99 U	0.94 U	0.9 U
Perfluorohexanesulfonic acid (PFHxS)	0.95 U	0.9 U	0.92 U	0.9 U	0.92 U	0.89 U	0.92 U	0.91 U	0.99 U	0.94 U	0.9 U
Perfluoro-n-nonanoic acid (PFNA)	0.95 U	0.9 U	0.92 U	0.9 U	0.92 U	0.89 U	0.92 U	0.91 U	0.99 U	0.94 U	0.9 U
Perfluoro-n-octanoic acid (PFOA)	0.95 U	0.9 U	0.92 U	0.9 U	0.92 U	0.89 U	0.92 U	0.91 U	0.99 U	0.94 U	0.9 U
Perfluorooctanesulfonic acid (PFOS)	0.95 U	0.9 U	0.92 U	0.9 U	0.92 U	0.89 U	0.92 U	0.91 U	0.99 U	0.94 U	0.9 U
<b>PFAS without Screening Criteria (ng/L)</b>											
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	2 U	1.9 U	1.8 U
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	1.9 U	1.8 U	1.8 U	1.8 U	99 V	1.8 U	1.8 U	1.8 U	1.7 U	1.9 U	1.8 U
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	2 U	1.9 U	1.8 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	2 U	1.9 U	1.8 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	2 U	1.9 U	1.8 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	2 U	1.9 U	1.8 U
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	2 U	1.9 U	1.8 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	2 U	1.9 U	1.8 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	2 U	1.9 U	1.8 U
Perfluoro-n-butanoic acid (PFBA)	0.95 U	0.9 U	0.92 U	0.9 U	0.92 U	0.89 U	0.92 U	0.91 U	0.99 U	0.94 U	0.9 U
Perfluoro-1-decanesulfonic acid (PFDS)	0.95 U	0.9 U	0.92 U	0.9 U	0.92 U	0.89 U	0.92 U	0.91 U	0.99 U	0.94 U	0.9 U
Perfluoro-n-decanoic acid (PFDA)	0.95 U	0.9 U	0.92 U	0.9 U	0.92 U	0.89 U	0.92 U	0.91 U	0.99 U	0.94 U	0.9 U
Perfluoro-n-dodecanoic acid (PFDoA)	0.95 U	0.9 U	0.92 U	0.9 U	0.92 U	0.89 U	0.92 U	0.91 U	0.99 U	0.94 U	0.9 U
Perfluoro-1-heptanesulfonic acid (PFHpS)	0.95 U	0.9 U	0.92 U	0.9 U	0.92 U	0.89 U	0.92 U	0.91 U	0.99 U	0.94 U	0.9 U
Perfluoro-n-heptanoic acid (PFHpA)	0.95 U	0.9 U	0.92 U	0.9 U	0.92 U	0.89 U	0.92 U	0.91 U	0.99 U	0.94 U	0.9 U
Perfluoro-n-hexanoic acid (PFHxA)	0.95 U	0.9 U	0.92 U	0.9 U	0.92 U	0.89 U	0.92 U	0.91 U	0.99 U	0.94 U	0.9 U
Perfluoro-1-nonanesulfonic acid (PFNS)	0.95 U	0.9 U	0.92 U	0.9 U	0.92 U	0.89 U	0.92 U	0.91 U	0.99 U	0.94 U	0.9 U
Perfluoro-1-pentanesulfonic acid (PFPeS)	0.95 U	0.9 U	0.92 U	0.9 U	0.92 U	0.89 U	0.92 U	0.91 U	0.99 U	0.94 U	0.9 U
Perfluoro-n-pentanoic acid (PFPeA)	0.95 U	0.9 U	0.92 U	0.9 U	0.92 U	0.89 U	0.92 U	0.91 U	0.99 U	0.94 U	0.9 U
Perfluoro-n-tetradecanoic acid (PFTeDA)	0.95 U	0.9 U	0.92 U	0.9 U	0.92 U	0.89 U	0.92 U	0.91 U	0.99 U	0.94 U	0.9 U
Perfluoro-n-tridecanoic acid (PFTrDA)	0.95 U	0.9 U	0.92 U	0.9 U	0.92 U	0.89 U	0.92 U	0.91 U	0.99 U	0.94 U	0.9 U
Perfluoro-n-undecanoic acid (PFUdA)	0.95 U	0.9 U	0.92 U	0.9 U	0.92 U	0.89 U	0.92 U	0.91 U	0.99 U	0.94 U	0.9 U

**Table 4-9. Site Assessment Field QA/QC Analytical Results (Continued)**

Sample ID	STP1-EB-20220315-01	STP1-EB-20220315-02	STP1-EB-20220315-03	STP1-FB-20220315-01
Date	3/15/2022	3/15/2022	3/15/2022	3/15/2022
Sample Depth (ft bls)	-	-	-	-
Type	EB	EB	EB	FB
<b>PFAS with Screening Criteria (ng/L)</b>				
Hexafluoropropylene oxide dimer acid (HFPO-DA) [GenX] <sup>3</sup>	1.8 U	1.8 U	1.8 U	1.8 U
Perfluoro-1-butanesulfonic acid (PFBS)	0.92 U	0.91 U	0.88 U	0.88 U
Perfluorohexanesulfonic acid (PFHxS)	0.92 U	0.91 U	0.88 U	0.88 U
Perfluoro-n-nonanoic acid (PFNA)	0.92 U	0.91 U	0.88 U	0.88 U
Perfluoro-n-octanoic acid (PFOA)	0.92 U	0.91 U	0.88 U	0.88 U
Perfluorooctanesulfonic acid (PFOS)	0.92 U	0.91 U	0.88 U	0.88 U
<b>PFAS without Screening Criteria (ng/L)</b>				
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	1.8 U	1.8 U	1.8 U	1.8 U
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	1.8 U	1.8 U	1.8 U	1.8 U
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	1.8 U	1.8 U	1.8 U	1.8 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CL-PF3ONS)	1.8 U	1.8 U	1.8 U	1.8 U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11CL-PF3OUDS)	1.8 U	1.8 U	1.8 U	1.8 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	1.8 U	1.8 U	1.8 U	1.8 U
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	1.8 U	1.8 U	1.8 U	1.8 U
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	1.8 U	1.8 U	1.8 U	1.8 U
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	1.8 U	1.8 U	1.8 U	1.8 U
Perfluoro-n-butanoic acid (PFBA)	0.92 U	0.91 U	0.88 U	0.88 U
Perfluoro-1-decanesulfonic acid (PFDS)	0.92 U	0.91 U	0.88 U	0.88 U
Perfluoro-n-decanoic acid (PFDA)	0.92 U	0.91 U	0.88 U	0.88 U
Perfluoro-n-dodecanoic acid (PFDoA)	0.92 U	0.91 U	0.88 U	0.88 U
Perfluoro-1-heptanesulfonic acid (PFHpS)	0.92 U	0.91 U	0.88 U	0.88 U
Perfluoro-n-heptanoic acid (PFHpA)	0.92 U	0.91 U	0.88 U	0.88 U
Perfluoro-n-hexanoic acid (PFHxA)	0.92 U	0.91 U	0.88 U	0.88 U
Perfluoro-1-nonanesulfonic acid (PFNS)	0.92 U	0.91 U	0.88 U	0.88 U
Perfluoro-1-pentanesulfonic acid (PFPeS)	0.92 U	0.91 U	0.88 U	0.88 U
Perfluoro-n-pentanoic acid (PFPeA)	0.92 U	0.91 U	0.88 U	0.88 U
Perfluoro-n-tetradecanoic acid (PFTeDA)	0.92 U	0.91 U	0.88 U	0.88 U
Perfluoro-n-tridecanoic acid (PFTrDA)	0.92 U	0.91 U	0.88 U	0.88 U
Perfluoro-n-undecanoic acid (PFUdA)	0.92 U	0.91 U	0.88 U	0.88 U

All results reported in nanogram per liter (ng/L)

1 The USEPA Regional Screening Levels (RSLs) for HFPO-DA, PFBS, PFHxS, PFNA, PFOA, and PFOS are presented in this table.

2 The Groundwater RSL is cited from the USEPA Regional Screening Levels and calculated with the USEPA RSL Calculator based on a hazard quotient of 0.1 (USEPA, 2022)

3 HFPO-DA is commonly referred to as GenX

-- = No applicable screening criteria

Bolding indicates analyte was detected

Shading indicates exceedance of screening criteria

EB = Equipment Blank

FB = Field Blank

STP1 = Sewage Treatment Plant #1

USEPA = United States Environmental Protection Agency

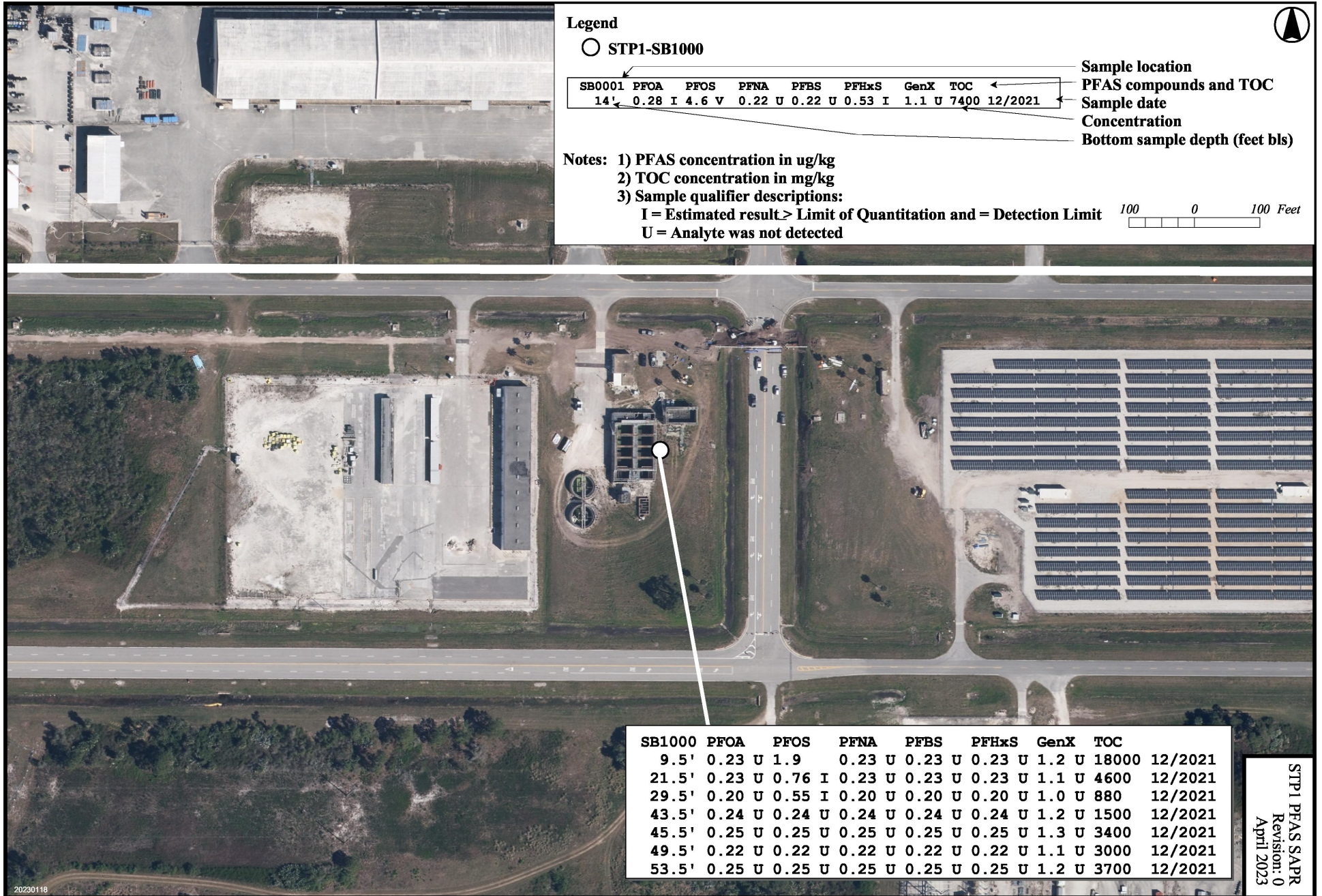
ft bls = feet below land surface

PFAS = per- and polyfluoroalkyl substances

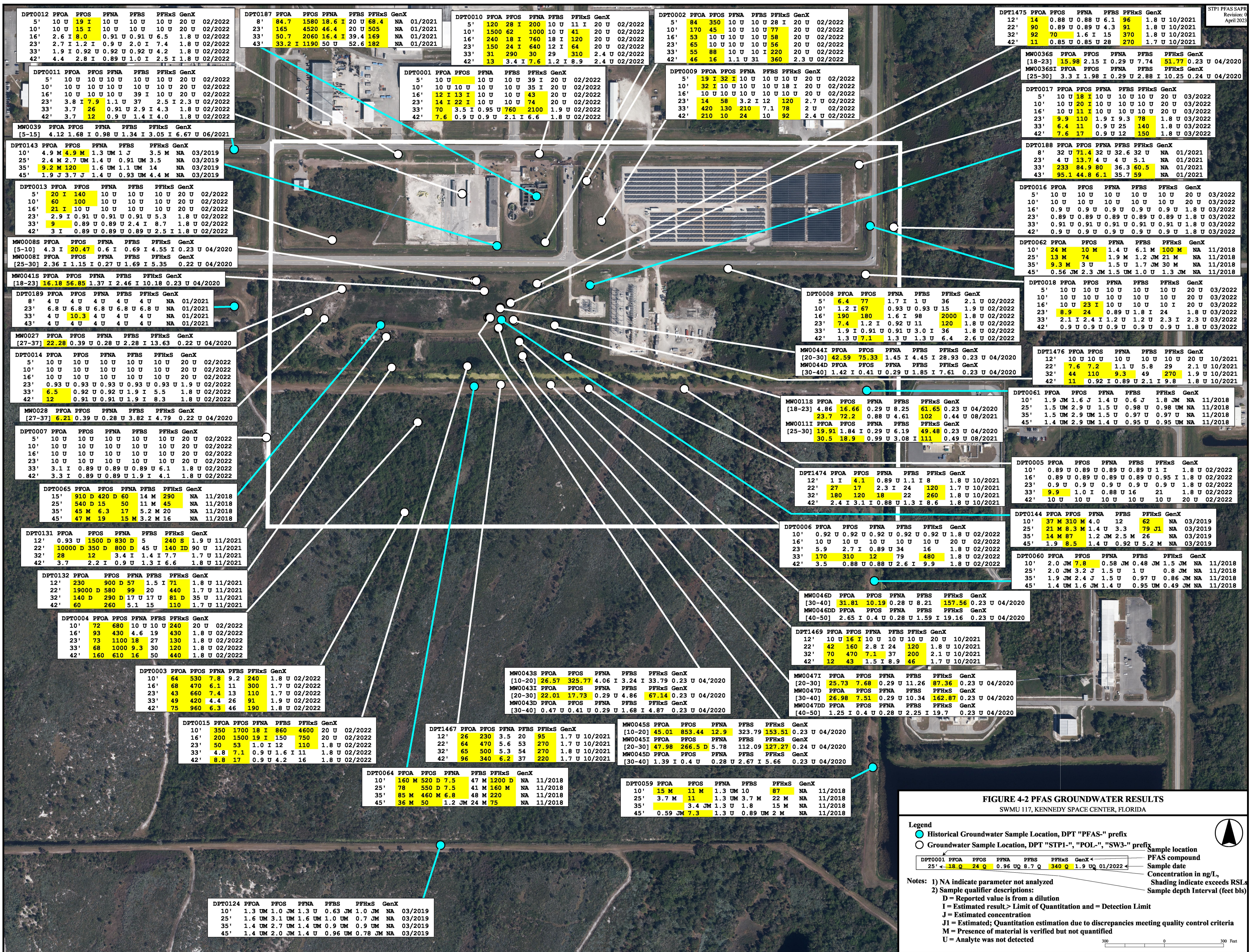
U = Analyte was not detected



FIGURE 4-1 PFAS SOIL RESULTS  
SWMU 117, KENNEDY SPACE CENTER, FLORIDA







**FIGURE 4-2 PFAS GROUNDWATER RESULTS**  
 SWM 117, KENNEDY SPACE CENTER, FLORIDA

**Legend**

- Historical Groundwater Sample Location, DPT "PFAS-" prefix
- Groundwater Sample Location, DPT "STP1-", "POL-", "SW3-" prefix

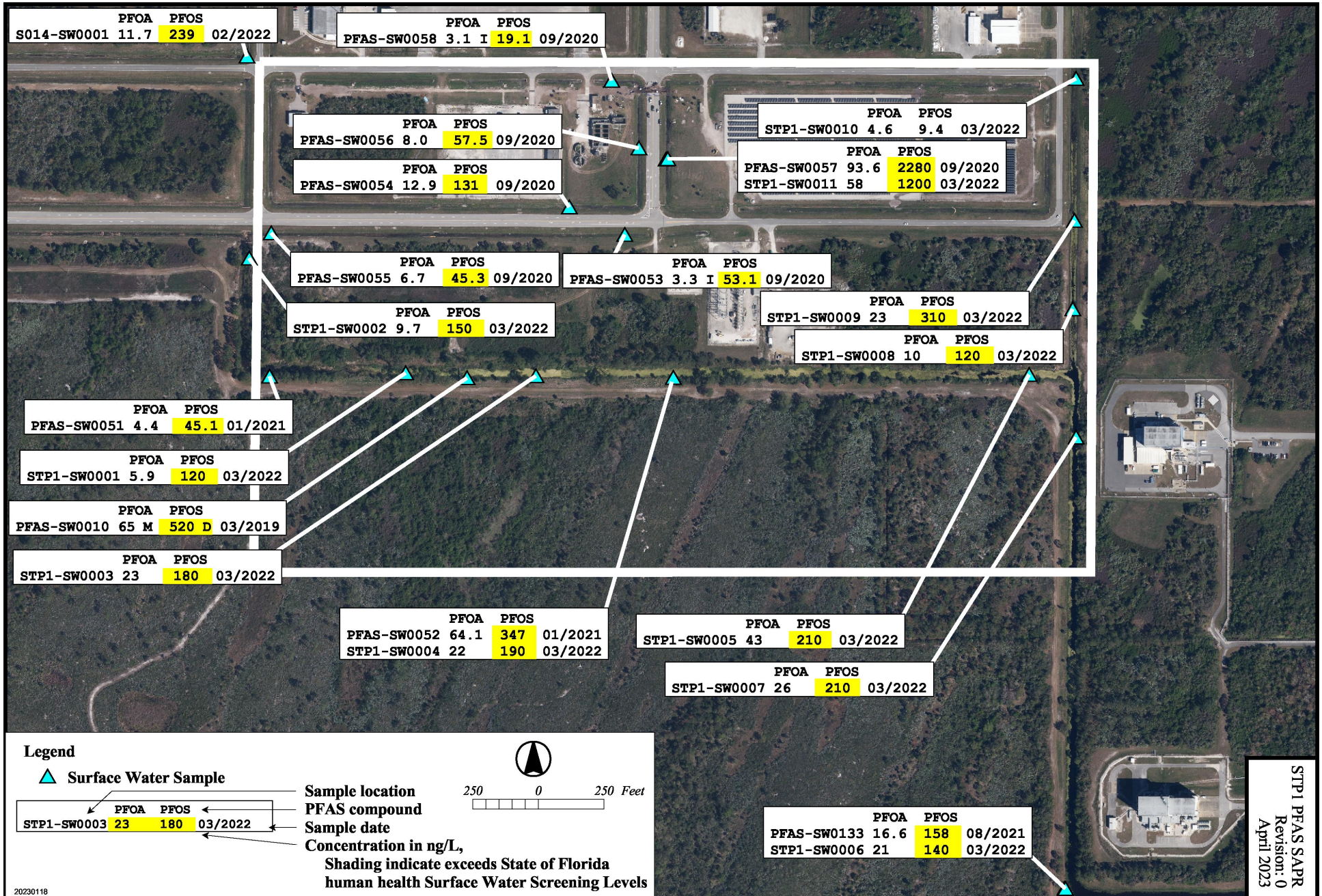
Sample location  
 PFAS compound  
 Sample date  
 Concentration in ng/L  
 Shading indicates exceeds RSLs  
 Sample depth Interval (feet bls)

**Notes:**

- 1) NA indicate parameter not analyzed
- 2) Sample qualifier descriptions:  
 D = Reported value is from a dilution  
 E = Estimated result > Limit of Quantitation and = Detection Limit  
 J = Estimated concentration  
 J1 = Estimated; Quantitation estimation due to discrepancies meeting quality control criteria  
 M = Presence of material is verified but not quantified  
 U = Analyte was not detected



FIGURE 4-3 CUMULATIVE PFAS SURFACE WATER RESULTS  
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## SECTION V

### CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 CONCLUSIONS

PFAS SA activities were conducted between April 2020 and March 2022 to collect additional data to supplement the existing datasets generated during the Phase I and Phase II/III SWMU Assessments and CS, and better understand the extent of PFAS impacts to the environment in the STP1 Area. Sampling included completion of one continuous soil core to 70 ft bls to evaluate lithology, collection of seven soil samples from the soil core for analysis of PFAS and TOC, collection of 131 groundwater DPT samples from 25 DPT locations up to depths of 44 ft bls, collection of groundwater from 22 existing monitoring wells, and collection of 11 surface water samples for PFAS analysis. Soil and groundwater results were screened against the most recent (November 2022) USEPA RSLs and surface water results were screened against the Florida SWSLs. In addition, historical PFAS analytical results collected at STP1 were re-screened against the most up-to-date screening levels and evaluated along with the recently collected results to gain an overall understanding of the PFAS distribution at the site.

Re-screening of historical analytical results from samples collected between 2018 and 2021 identified groundwater, soil, and surface water samples with screening level exceedances. Sediment samples also had PFAS detections, but there are currently no screening levels for sediment. Results from the SA also showed exceedances of the applicable screening criteria for groundwater, soil, and surface water. Of the 131 DPT groundwater samples collected over 25 locations, 16 PFAS compounds were detected with five compounds (PFBS, PFHxS, PFNA, PFOA, and PFOS) exceeding RSLs. There were no detections of HFPO-DA (GenX). The maximum concentration for three of the five compounds (PFBS, PFHxS, and PFOS) was from the STP1-DPT0015 location, south of the former Polishing Pond, and in the former Spray Field. The PFNA maximum concentration was from STP1-DPT0010, located on the east side of C Avenue SE, to the east of the STP. The PFOA maximum concentration was from the SW3-DPT0132 location, south of the former Sludge Disposal Area. Overall, the maximum concentration of any PFAS in DPT groundwater was PFOA at 19,000 ng/L in the 20-24 ft bls

interval in SW3-DPT0132. The DPT results show that PFAS concentrations generally decreased with depth with the highest concentrations in the shallow intervals.

The monitoring wells sampled as part of the SA, all of which are associated with the POL or SW3 remediation sites (SWMUs 067 and 088) and located in the southern portion of the site, had detections of five of the six PFAS with USEPA RSLs, and PFHxS, PFNA, PFOA, and PFOS were detected at concentrations greater than RSLs. There were no detections of HFPO-DA (GenX). The well with the overall maximum concentration of any PFAS was POL-MW0045S (screened 10 to 20 ft bls), with a PFOS concentration of 853.44 ng/L. This well is part of the POL site (SWMU 067) and is located just north of the former Polishing Pond.

Of the 7 soil samples collected at one continuous boring location, no PFAS compounds exceeded the RSLs. There were low-level detections of PFOS, ranging from 0.55 to 1.9 µg/kg, in the upper three depth intervals that extended down to 30 ft bls, but none of them exceeded the RSL. The soil samples with the highest TOC results corresponded to the shallowest intervals, with the highest organic content (black and brown sands). Of note, all soil samples were collected in the saturated zone, and the historical co-located DPT groundwater location (PFAS-DPT0187) had an elevated concentration of PFOS (4,520 ng/L) in the 23-27 ft bls interval. The historical co-located soil sample in the unsaturated zone (PFAS-SB0064, 0-0.5 and 0.5-2 ft bls) also had low-level PFOS detections (1.2 µg/kg and 2 µg/kg, respectively), but not above the RSL.

Of the 11 surface water samples collected during the SA, all of them had detections of PFOA and PFOS. There were no detections of PFOA greater than the SWSL of 500 ng/L, but 10 of the 11 samples had detections of PFOS greater than the SWSL of 10 ng/L. The maximum concentration was 1,200 ng/L in STP1-SW0011, located in the drainage ditch east of the STP, on the east side of C Avenue SE.

Considering the current and historical datasets, PFOS is the prevalent PFAS compound in the STP1 Area with the highest concentrations mostly identified in the vicinity of the former Sludge Disposal Area and Polishing Pond.

A summary of samples collected during the SA are presented in the table below:

	PFOA	PFOS	PFBS	PFHxS	PFNA	HFPO-DA (GenX)
<b>(USEPA) Soil RSLs (µg/kg)</b>	<b>19</b>	<b>13</b>	<b>1,900</b>	<b>130</b>	<b>19</b>	<b>23</b>
Samples collected	7	7	7	7	7	7
No. of Detections	0	3	0	0	0	0
Results above RSL	0	0	0	0	0	0
<b>(USEPA) Groundwater RSLs (ng/L)</b>	<b>6</b>	<b>4</b>	<b>600</b>	<b>39</b>	<b>5.9</b>	<b>6</b>
Samples collected (DPT)	131	131	131	131	131	131
No. of Detections (DPT)	92	84	70	95	42	0
Results above RSL (DPT)	72	73	2	54	26	0
Samples collected (MW)	24	24	24	24	24	24
No. of Detections (MW)	23	17	24	24	6	0
Results above RSL (MW)	15	13	0	11	1	0
<b>(Florida) Surface Water SWSLs (ng/L)</b>	<b>500</b>	<b>10</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>
Samples collected	11	11	11	11	11	11
No. of Detections	11	11	11	11	10	0
Results above SWSL	0	10	NA	NA	NA	NA

NA = Not applicable; no screening criteria

A photographic log for SA activities is provided in Appendix D.

## 5.2 RECOMMENDATIONS

Based on the results of the SA, additional groundwater and surface water sampling for PFAS should be considered. Collection of additional samples for TOC analysis should also be considered from representative groundwater (saturated soils) and surface water locations to further evaluate potential correlations between PFAS and TOC to provide a more comprehensive dataset to assist in fate and transport analyses. Because of the potential for discharge to the Banana River Lagoon, the next phase of sampling will be focused on surface water bodies to the southeast of the STP1 Area. Potential sample locations include influent into the Gator Pond, effluent from the Gator Pond, associated borrow pits that are part of the stormwater management system, tributaries into Buck Creek, locations within Buck Creek, the junction of Buck Creek and the Banana River, and isolated borrow pits northeast of Gator Pond, and locations along the Banana River. Additionally, installation of monitoring wells should be considered to evaluate the interaction between groundwater and surface water at the site. Potential groundwater and surface

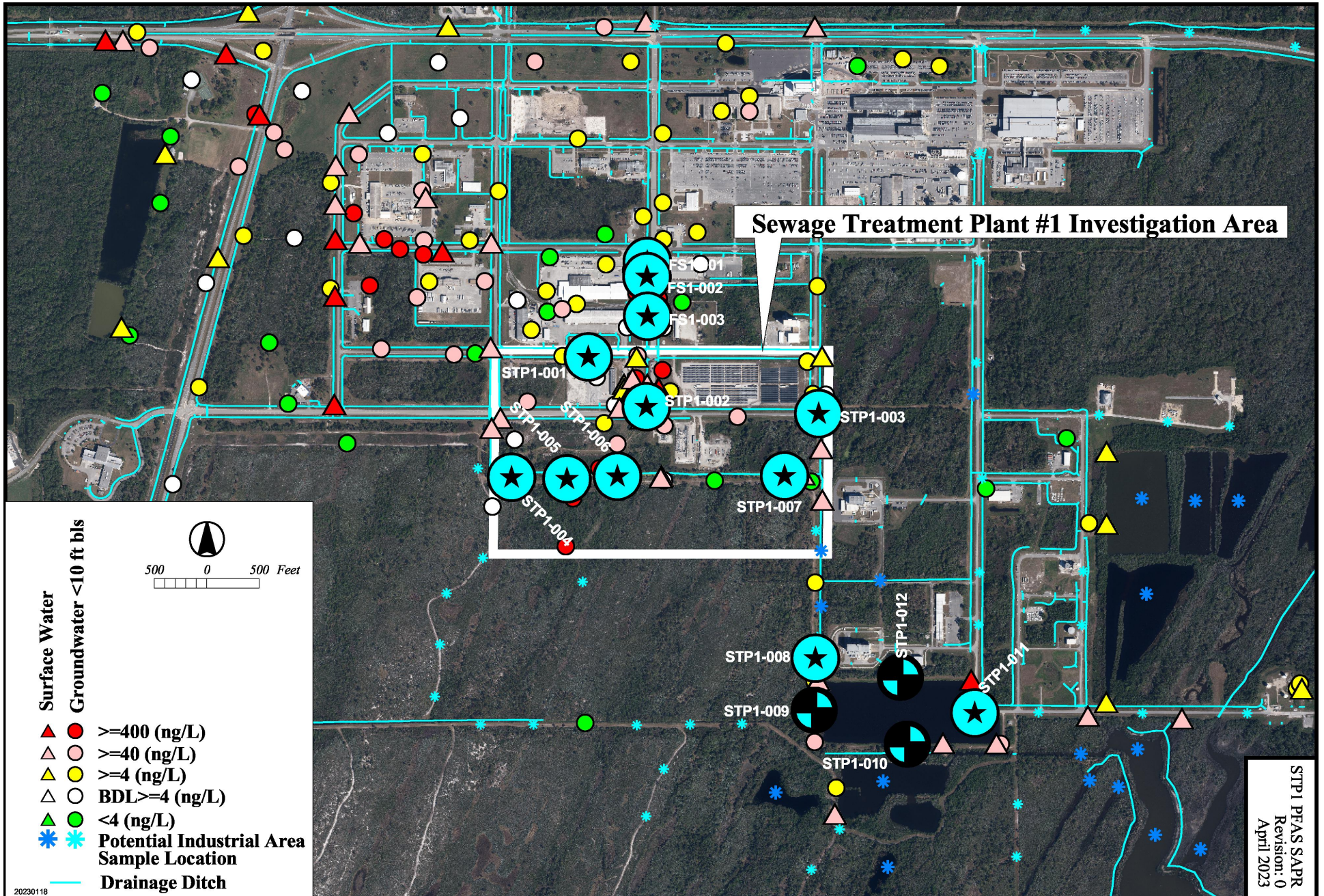


water samples are shown on Figure 5-1. It should be noted that not all potential samples are expected to be sampled during the next phase of the investigation but may be considered as funding allows. The SA results and potential path forward were presented to the KSC Remediation Team (KSCRT) in October 2022 (Meeting Minute 2210-M08). An action item was taken (2210-A08) to provide FDEP with locations of potential monitoring wells once they are determined. The meeting minutes are included in Appendix E.

The STP1 Complex has been identified as one of seven SWMUs in the KSC Industrial Area undergoing PFAS investigations. These sites are described as the Industrial Area SWMU Group, which also includes the GSA Automotive Facility (SWMU 13), the Maintenance & Operations Building (aka, Base Support Building) (SWMU 14), the Central Supply Warehouse (SWMU 92), Fire Station 1 (SWMU 116), KARS Park II (SWMU 118), and the Former Central Instrumentation Facility Residuals Disposal Area (SWMU 126). Future phases of PFAS investigation will evaluate interactions between releases from these sites to develop an overview of PFAS effects in the KSC Industrial Area as a whole. Specifically, because the STP1 Complex is downgradient from Fire Station 1, the effects of PFAS are likely interrelated for groundwater and surface water. Future reports may combine those two sites for a comprehensive overview.



FIGURE 5-1 PROPOSED SAMPLE LOCATIONS  
SWMU 117, KENNEDY SPACE CENTER, FLORIDA



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