

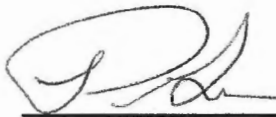
Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater

October 2023

Prepared for
**National Aeronautics and Space Administration
Santa Susana Field Laboratory, Ventura County, California**

Professional Geologist's Certification

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10/2/2023

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Executive Summary

This report presents the results of the Site Inspection (SI) for per- and polyfluoroalkyl substances (PFAS) at the National Aeronautics and Space Administration (NASA) Santa Susana Field Laboratory (SSFL) in Ventura County, California.

SSFL is approximately 29 miles northwest of downtown Los Angeles, California, in the southeast corner of Ventura County. SSFL occupies approximately 2,850 acres of hilly terrain, with approximately 1,100 feet of topographic relief near the crest of the Simi Hills. The site is divided into four administrative areas (Areas I, II, III, and IV) and includes undeveloped land to the north and south. Area II and a portion of Area I are owned by the federal government and administered by NASA (Figures ES-1 and ES-2). The primary site activities at the NASA-administered areas of SSFL included research, development, and testing of liquid-fueled rocket engines and associated components (such as pumps and valves) (MWH 2009; SAIC 1994). Most of Area I and all of Areas III and IV are owned by The Boeing Company (Boeing). Ninety acres of Area IV were leased to the U.S. Department of Energy, which also owns facilities in Area IV. The northern and southern undeveloped lands of SSFL were not used for industrial activities and are owned by Boeing.

On behalf of NASA and in response to a request from the California Department of Toxic Substances Control (DTSC), CH2M HILL, Inc., a wholly owned subsidiary of Jacobs, conducted an SI for PFAS in soil and groundwater in 2022 in accordance with the approved SI Work Plan (WP) (NASA 2022). The objective of the SI was to evaluate the presence or absence of PFAS in soil and groundwater within or near the areas of potential concern (AOPCs) that were identified in the Preliminary Assessment (PA) (NASA 2021). These AOPCs were originally grouped together in the PA based on the type of area investigated (test stand, skim pond, etc.). Upon further review and considering field implementation planning, the following AOPCs were re-grouped based on proximity (site areas) in the SI WP and are organized and discussed in this SI accordingly (Figure ES-2):

- Area II Landfill
- Building 2206
- Area II Sewage Treatment Plant and Building 2207
- Alfa Test Stands, Alfa Retention Pond, and Alfa Skim Pond
- Bravo Test Stands, Bravo Skim Pond, and Alfa-Bravo Skim Pond
- Coca Test Stands and Coca Skim Pond
- Delta Test Stands and Delta Skim Pond

PFAS are water-soluble and relatively mobile through soils to groundwater. Therefore, if a historical release has occurred at potential PFAS release areas, it is likely to be detected within groundwater at the release area and/or downgradient. Based on this rationale, groundwater samples were collected from existing wells within the AOPCs recommended for the SI. Surface and subsurface soil samples were also collected, or attempted, and analyzed for PFAS at all AOPCs investigated, subject to availability of soil versus exposed bedrock at investigation locations. Groundwater and soil samples were analyzed for the 18 PFAS listed in U.S. Environmental Protection Agency Method 537.1 via liquid chromatography tandem mass spectrometry compliant with the U.S. Department of Defense (DoD) Quality Systems Manual 5.3 Table B-15 (DoD 2019), in accordance with the laboratory's Environmental Laboratory Accreditation Program accreditation letters.

Subsequent to the finalization of the SI WP and consistent with the June 2022 DoD Assistant Secretary of Defense memorandum (DoD 2022), screening levels (SLs) for perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PFHxS), and hexafluoropropylene oxide dimer acid (HFPO-DA) (aka "GenX chemicals") have been developed, and the SLs for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) have been updated. The SL for perfluorobutane sulfonate (PFBS) remains the same as

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listed in the SI WP. Groundwater data were screened against residential scenario tap water SLs for PFOA, PFOS, PFBS, PFHxS, PFNA, and HFPO-DA presented in the May 2022 Regional Screening Level (RSL) Table (EPA 2022a). Soil data were screened against residential scenario soil SLs for PFOA, PFOS, PFBS, PFHxS, PFNA, and HFPO-DA presented in the May 2022 RSL Table (EPA 2022a).

Thus, the SLs for HFPO-DA, PFBS, PFHxS, PFNA, PFOA, and PFOS are as follows:

- HFPO-DA:
 - Soil SL: 23 micrograms per kilogram ($\mu\text{g}/\text{kg}$)
 - Groundwater SL: 0.006 microgram per liter ($\mu\text{g}/\text{L}$)
- PFBS:
 - Soil SL: 1,900 $\mu\text{g}/\text{kg}$
 - Groundwater SL: 0.6 $\mu\text{g}/\text{L}$
- PFHxS:
 - Soil SL: 130 $\mu\text{g}/\text{kg}$
 - Groundwater SL: 0.039 $\mu\text{g}/\text{L}$
- PFNA:
 - Soil SL: 19 $\mu\text{g}/\text{kg}$
 - Groundwater SL: 0.006 $\mu\text{g}/\text{L}$
- PFOA:
 - Soil SL: 19 $\mu\text{g}/\text{kg}$
 - Groundwater SL: 0.006 $\mu\text{g}/\text{L}$
- PFOS:
 - Soil SL: 13 $\mu\text{g}/\text{kg}$
 - Groundwater SL: 0.004 $\mu\text{g}/\text{L}$

Summary of Groundwater and Soil Results

Groundwater samples were collected from existing wells in each AOPC in both the near-surface groundwater (NSGW) and Chatsworth Formation groundwater (CFGW) systems. PFAS were detected in 21 groundwater samples; 19 groundwater samples exceeded the SLs (Table 4-1). The NSGW system is discontinuous and therefore does not pose a concern for offsite migration. The CFGW exceedances are located at least 0.2 mile from the nearest downgradient property line. The groundwater concentrations are consistent with surface releases of PFAS.

The presence of PFAS constituents in groundwater at levels exceeding the SLs does indicate that releases to surface soils occurred at the site in the past, resulting in degradation of underlying groundwater quality. However, because of the very limited soil horizon present at SSFL, it is possible that the surface releases occurred onto exposed bedrock or in areas of very little soil residuum. Under these conditions, the mass of PFAS stored in the thin soil horizon might be inconsequential and might not represent an ongoing source impacting groundwater quality. Surface and subsurface soil samples were collected in each AOPC, with the exception of Delta Test Stands and Delta Skim Pond, where only a surface sample was collected because of shallow refusal (less than 2 feet). PFAS were detected in 17 surface soil samples and 6 subsurface soil samples; none of the surface or subsurface soil samples exceeded the SLs (Table 4-2).

Summary of Recommendations

No further action is recommended in groundwater for the Area II Landfill AOPC.

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Further evaluation is warranted for groundwater and soil for the following remaining AOPCs that had PFAS groundwater exceedances above the SLs, based on NASA precedent:

- Building 2206
- Area II Sewage Treatment Plant and Building 2207
- Alfa Test Stands and Alfa Skim Pond
- Bravo Test Stands, Alfa- Bravo Skim Pond, and Bravo Skim Pond
- Coca Test Stands and Coca Skim Pond
- Delta Test Stands and Delta Skim Pond

Sites could be prioritized for work based on PFAS concentration levels (compared to SLs). Further investigation could be accomplished by sampling groundwater from other existing wells proximal to the previously sampled monitoring wells that show PFAS exceedances.

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Acronyms and Abbreviations

°C	degree(s) Celsius
°F	degree(s) Fahrenheit
µg/kg	microgram(s) per kilogram
µg/L	microgram(s) per liter
AFFF	aqueous film-forming foam
AOPC	area of potential concern
bgs	below ground surface
Boeing	The Boeing Company
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFGW	Chatsworth Formation groundwater
DoD	U.S. Department of Defense
DPT	direct-push technology
DTSC	California Department of Toxic Substances Control
ELV	Expendable Launch Vehicle
EPA	U.S. Environmental Protection Agency
FLUTe	Flexible Liner Underground Technologies
GW	groundwater
HA	health advisory
HDPE	high-density polyethylene
HFPO-DA	hexafluoropropylene oxide dimer acid
IDW	investigation-derived waste
MS	matrix spike
MSD	matrix spike duplicate
NASA	National Aeronautics and Space Administration
ND	no data
ng/L	nanogram(s) per liter
NSGW	near-surface groundwater
PA	Preliminary Assessment
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutane sulfonate
PFHxS	perfluorohexanesulfonic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid

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PFOS	perfluorooctane sulfonate
ppt	part(s) per trillion
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RfD	reference dose
RSL	Regional Screening Level
SB	subsurface soil
SI	site inspection
SL	screening level
SOP	standard operating procedure
SS	surface soil
SSFL	Santa Susana Field Laboratory
STP	sewage treatment plant
SWRCB	California State Water Resources Control Board
WQP	water quality parameter
WP	work plan

1. Introduction

This Site Inspection (SI) report presents the data results obtained from a per- and polyfluoroalkyl substances (PFAS) investigation conducted at the National Aeronautics and Space Administration (NASA) Santa Susana Field Laboratory (SSFL) in Ventura County, California.

SSFL is approximately 29 miles northwest of downtown Los Angeles, California, in the southeast corner of Ventura County. SSFL occupies approximately 2,850 acres of hilly terrain, with approximately 1,100 feet of topographic relief near the crest of the Simi Hills. The site is divided into four administrative areas (Areas I, II, III, and IV) and includes undeveloped land to the north and south. Area II and a portion of Area I are owned by the federal government and administered by NASA (Figures ES-1 and ES-2). The primary site activities at the NASA-administered areas of SSFL included research, development, and testing of liquid-fueled rocket engines and associated components (such as pumps and valves) (MWH 2009; SAIC 1994). Most of Area I and all of Areas III and IV are owned by The Boeing Company (Boeing). Ninety acres of Area IV were leased to the U.S. Department of Energy, which also owns facilities in Area IV. The northern and southern undeveloped lands of SSFL were not used for industrial activities and are owned by Boeing.

The objectives of the SI were defined in the *Site Inspection Work Plan of Per- and Polyfluoroalkyl Substances in Soil and Groundwater, SSFL, Ventura County, California* (SI WP) (NASA 2022). The objective was to evaluate whether PFAS are present in soil and groundwater near and/or within the areas of potential concern (AOPCs) that were identified in the Preliminary Assessment (PA) (NASA 2021). AOPCs were identified in the PA for further investigation. These AOPCs were originally grouped together in the PA based on the type of area investigated (test stand, skim pond, etc.). Upon further review and considering field implementation planning, these AOPCs were re-grouped based on proximity (site areas) in the SI WP are organized and discussed in this SI as follows:

- Area II Landfill (Figures ES-2, 2-1, and 2-2)
- Building 2206 (Figures ES-2, 2-3, and 2-4)
- Area II Sewage Treatment Plant (STP) and Building 2207 (Figures ES-2, 2-5, and 2-6)
- Alfa Test Stands, Alfa Retention Pond, and Alfa Skim Pond (Figures ES-2, 2-7, and 2-8)
- Bravo Test Stands, Bravo Skim Pond, and Alfa-Bravo Skim Pond (Figures ES-2, 2-9, and 2-10)
- Coca Test Stands and Coca Skim Pond (Figures ES-2, 2-11, and 2-12)
- Delta Test Stands and Delta Skim Pond (Figures ES-2, 2-13, and 2-14)

Groundwater samples were collected from existing wells in each AOPC in both the NSGW and CFGW water-bearing units and are discussed in Section 3 (Table 3-1). As discussed in Section 4, PFAS were detected in 21 groundwater samples; 19 groundwater samples exceeded the SLs (Table 4-1). Surface and subsurface soil samples were collected in each AOPC. PFAS were detected in 17 surface soil samples and 6 subsurface soil samples; however, none of the surface or subsurface soil samples exceeded the SLs (Table 4-2).

This SI report outlines the approach taken to achieve the listed objectives, results, and conclusions regarding data collected, and provides recommendations. This report was prepared for NASA by CH2M HILL Inc., a wholly owned subsidiary of Jacobs.

1.1 PFAS Background

PFAS have been identified by the U.S. Department of Defense (DoD) and the U.S. Environmental Protection Agency (EPA) as emerging contaminants.¹ PFAS are of environmental concern because of their persistence in the environment and in organisms, their migration potential in aqueous systems (for example, groundwater), their historically widespread use in commercial products, and their possible health effects at low levels of exposure. PFAS are anthropogenic compounds with multiple, strong carbon-fluorine bonds.

The chemical properties of PFAS make them useful for many commercial products because they are heat-resistant and can repel oil, grease, and water. PFAS have been manufactured for use in a wide variety of products, including firefighting foam (aqueous film-forming foam [AFFF]), nonstick cookware, fiber and fabric stain protection, food packaging, and personal care products. The pervasive use of PFAS in commercial and industrial products has led to the discovery of PFAS in soil, air, and groundwater worldwide.

PFAS have been used in a variety of military and aerospace applications, including as a component of AFFF. PFAS from AFFF used in firefighting, firefighting training and equipment testing, and fire suppression systems are considered to have the greatest potential for release of PFAS to the environment in terms of mass and concentration. Other potential sources of PFAS to the environment include operations wastes (for example, from chromium electroplating), historical onsite land disposal areas and landfills, and wastewater treatment sludges and effluents.

Additional research is needed to more clearly understand the potential health effects that may be caused by exposure to PFAS. To date, only limited information exists on a few of the thousands of PFAS used in commerce. Currently, Tier 1 toxicity values are unavailable for any PFAS. Tier 1 toxicity values are the preferred source for toxicity factors in Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Resource Conservation and Recovery Act (RCRA) assessments. EPA's Office of Water developed a reference dose (RfD) for perfluorooctanoic acid (PFOA) that is based on a developmental toxicity study using mice (EPA 2016a). EPA's Office of Water also determined that PFOA should be classified as "suggestive evidence of carcinogenic potential" and estimated an oral cancer slope factor based on tumor development in rat testes (EPA 2016b). EPA's Office of Water also estimated an RfD for perfluorooctane sulfonate (PFOS) based on a developmental toxicity study using rats (EPA 2016b).

EPA's Office of Research and Development released "Human Health Toxicity Values for Perfluorobutane Sulfonic Acid (Chemical Abstracts Service Registry Number [CASRN] 375-73-5) and Related Compound Potassium Perfluorobutane Sulfonate (CASRN 29420-49-3)," in April 2021 (EPA 2021a). This toxicity assessment provides chronic and subchronic oral RfDs for perfluorobutane sulfonate (PFBS) that are considered Tier 2 noncarcinogenic toxicity values for use in CERCLA investigations. The PFBS oral RfDs are based on thyroid effects (such as decreased thyroid hormone levels). However, because of a lack of information in the current literature on PFBS inhalation toxicity or carcinogenicity, toxicity values for inhalation exposure and cancer endpoints could not be estimated for PFBS (EPA 2021a).

EPA's Office of Water released "Human Health Toxicity Values for Hexafluoropropylene Oxide (HFPO) Dimer Acid and Its Ammonium Salt (CASRN 13252-13-6 and CASRN 62037-80-3)," in October 2021 (EPA 2021b). This toxicity assessment provides chronic and subchronic oral RfDs for hexafluoropropylene oxide dimer acid (HFPO-DA) (aka "GenX chemicals") that are considered Tier 2 noncarcinogenic toxicity

¹ Per DoD Instruction 4715.18: "As identified by the [Assistant Secretary of Defense for Energy, Installations, and Environment], an emerging contaminant is a contaminant that: has a reasonably possible pathway to enter the environment; presents a potential unacceptable human health or environmental risk; and does not have regulatory standards based on peer-reviewed science, or the regulatory standards are evolving due to new science, detection capabilities, or pathways."

values for use in CERCLA investigations. The PFBS oral RfDs are based on liver effects (such as increased liver weight, necrosis, and apoptosis). Because of a lack of information in the current literature on HFPO-DA inhalation or dermal toxicity or carcinogenicity, toxicity values for these exposure and cancer endpoints could not be estimated (EPA 2021b).

1.2 Regulatory Status and Advisory Levels

The regulatory status of PFAS varies widely across the United States and the world. Some states have adopted the EPA lifetime health advisories (HAs) for PFOA and PFOS as drinking water targets, while others have developed or are deriving their own regulatory guidance or screening values for PFOA and PFOS, and in some cases for other PFAS.

Several states are in the process of promulgating standards for PFAS. In February 2020, the California State Water Resources Control Board (SWRCB) lowered the response levels for drinking water providers to address PFOA and PFOS impacts on the state's water supplies. The response levels are 10 nanograms per liter (ng/L) for PFOA, 40 ng/L for PFOS, and 5,000 ng/L for PFBS (SWRCB 2020). The latest response levels are based on updated health recommendations from the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment.

The reductions are part of SWRCB's comprehensive investigation into the extent of PFOA and PFOS contamination in water systems and groundwater statewide.

Notification levels are nonregulatory, health-based advisory levels established for contaminants in drinking water for which maximum contaminant levels have not been established. Notification levels are established as precautionary measures for contaminants that may be considered candidates for establishment of maximum contaminant levels but have not yet undergone or completed the regulatory standard setting process prescribed for the development of maximum contaminant levels and are not drinking water standards.

In August 2019, the SWRCB Division of Drinking Water established notification levels of 6.5 ng/L for PFOS, 5.1 ng/L for PFOA, and 500 ng/L for PFBS (SWRCB 2020). California has not established groundwater cleanup standards for any PFAS at the state level. In May 2016, EPA's Office of Water issued drinking water lifetime HAs for PFOA and PFOS based on existing RfDs (EPA 2016a, 2016b); HAs are not enforceable regulatory levels. A lifetime HA is set based on an assumption of a lifetime of exposure to PFOA and PFOS from drinking water. The lifetime HA is 70 ng/L for PFOA and 70 ng/L for PFOS. When both PFOA and PFOS are found in drinking water, the combined concentrations of PFOA and PFOS should be compared with the 70 parts per trillion (ppt) HA level. On June 15, 2022, EPA issued interim updated drinking water HAs for PFOA (0.004 ng/L) and PFOS (0.02 ng/L) that replace those EPA issued in 2016 (EPA 2022b). At the same time, EPA also issued final HAs for two other PFAS: PFBS (2,000 ng/L) and HFPO-DA (10 ng/L) (EPA 2022c, 2022d). These HA levels are not used for project screening levels (SLs); they are associated with notification requirements for drinking water systems, which do not apply to SSFL.

Neither EPA nor California regulatory bodies have promulgated standards for any PFAS in soil. Using the EPA Regional Screening Level (RSL) calculator, soil direct exposure levels and tap water/groundwater (GW) SLs were calculated (using Hazard Quotient = 0.1) for PFOA, PFOS, PFBS, HFPO-DA, perfluorohexane sulfonate (PFHxS), and perfluorononanoic acid (PFNA).

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The SLs (using Hazard Quotient = 0.1) for the NASA SSFL SI are as follows:

- HFPO-DA (Gen X)
 - Soil SL: 23 micrograms per kilogram ($\mu\text{g}/\text{kg}$)
 - Groundwater SL: 0.006 microgram per liter ($\mu\text{g}/\text{L}$)
- PFBS
 - Soil SL: 1,900 $\mu\text{g}/\text{kg}$
 - Groundwater SL: 0.6 $\mu\text{g}/\text{L}$
- PFHxS
 - Soil SL: 130 $\mu\text{g}/\text{kg}$
 - Groundwater SL: 0.039 $\mu\text{g}/\text{L}$
- PFNA
 - Soil SL: 19 $\mu\text{g}/\text{kg}$
 - Groundwater SL: 0.006 $\mu\text{g}/\text{L}$
- PFOA
 - Soil SL: 19 $\mu\text{g}/\text{kg}$
 - Groundwater SL: 0.006 $\mu\text{g}/\text{L}$
- PFOS
 - Soil SL: 13 $\mu\text{g}/\text{kg}$
 - Groundwater SL: 0.004 $\mu\text{g}/\text{L}$

2. Site Background and Physical Setting

This section provides details on the site background and the physical setting of SSFL.

2.1 Background

Major operational activities at SSFL fit broadly into the following categories:

- Large rocket engine testing
- Small rocket or other engine testing
- Component testing
- Support or testing laboratories
- Other material testing and production
- Storage areas
- Landfills
- Surface water ponds
- Fuel farms and storage tanks
- STPs and leach fields
- Maintenance and incinerator locations

Minor operational activities included facility and equipment maintenance, laboratory analysis, and metal plating.

A PFAS PA was completed for the NASA-administered areas for SSFL (NASA 2021). The following AOPCs were recommended for further investigation:

- Area II Landfill
- Building 2206
- Building 2207
- Area II STP
- Alfa, Bravo, Coca, and Delta Test Stands
- Alfa, Bravo, Alfa-Bravo, Coca, and Delta Skim Ponds

Upon further review, these AOPCs were re-grouped based on proximity (site area) in the SI WP and are organized and discussed in this SI as follows:

- Area II Landfill (Figures ES-2, 2-1, and 2-2)
- Building 2206 (Figures ES-2, 2-3, and 2-4)
- Area II STP and Building 2207 (Figures ES-2, 2-5, and 2-6)
- Alfa Test Stands, Alfa Retention Pond, and Alfa Skim Pond (Figures ES-2, 2-7, and 2-8)
- Bravo Test Stands, Bravo Skim Pond, and Alfa-Bravo Skim Pond (Figures ES-2, 2-9, and 2-10)
- Coca Test Stands and Coca Skim Pond (Figures ES-2, 2-11, and 2-12)
- Delta Test Stands and Delta Skim Pond (Figures ES-2, 2-13, and 2-14)

The following sections describe the background and PA results for each AOPC (Figure ES-2).

2.1.1 Area II Landfill

The Area II Landfill is located north of Service Area Road (Figures ES-2, 2-1 and 2-2). This location was used to dispose of unused fill materials, vegetation, some drums with unknown contents, and construction

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debris (ICF Kaiser 1993). Previous visual site investigations at the landfill reported that waste appeared to consist of construction debris such as asphalt pieces, timber, vegetation, piping, cement, glass, and steel.

The PA identified the Area II Landfill as a potential PFAS release area and recommended it for further investigation because of the disposal of drums with unknown contents.

2.1.2 Building 2206

Building 2206 is located north of Service Area Road and east of Ctl II Road (Figures ES-2, 2-3 and 2-4). Building 2206 was constructed in 1989 and demolished in 2015. It was used for engine assembly, chemical storage, and office space.

The PA identified Building 2206 as a potential PFAS release area and recommended it for further investigation because of metal plating operations known to have occurred at this location that might have used PFAS-containing materials.

2.1.3 Area II Sewage Treatment Plant and Building 2207

The Area II STP is located south of Service Area Road and east of Test Area Road (Figures ES-2, 2-5, and 2-6). The building was constructed in 1961 and demolished in 2017. This building received waste from the Expendable Launch Vehicle (ELV) and the Service Area.

The PA identified the Area II STP as a potential PFAS release area and recommended it for further investigation because of the waste received from the ELV, including Building 2207, which stored AFFF.

Building 2207 is located near the northern border of Area II at the intersection of Area II Road and Test Area Road. Building 2207 was constructed in 1956 and demolished in 2015 (Figures ES-2, 2-5 and 2-6). It was used as a security control center, fire station, and Protective Services Building.

The PA identified Building 2207 as a potential PFAS release area and recommended it for further investigation because of AFFF storage.

2.1.4 Alfa Test Stands, Alfa Retention Pond, and Alfa Skim Pond

The Alfa Test Stands (Historical Test Stands 2727 and 2729), are shown on Figures ES-2, 2-7, and 2-8. The test stands were constructed from 1954 to 1955 and were historically used for engine testing, maintenance, and cleaning.

The Alfa Retention and Skim Ponds are located in Area II of SSFL (Figures ES-2, 2-7, and 2-8). The ponds were constructed in 1956 and were used to collect liquid waste from the Alfa Test Stands. Both the Alfa Retention Pond and the Alfa Skim Pond each have a 500,000-gallon capacity. These ponds are unlined retention ponds for spent cooling water and residual trichloroethene from the Alfa Test Stands testing and cleaning activities. The ponds are inactive and dry; however, surface water can collect in the ponds occasionally during the rainy season.

The PA identified the Alfa Test Stands, Alfa Retention Pond, and Alfa Skim Pond as potential PFAS release areas and recommended them for further investigation because of the use of the PFAS-containing materials, including Braycote hydraulic oil and a chlorofluorocarbon cleaning solution that might have been transported from the Test Stands area to the Retention and Skim Ponds.

2.1.5 Bravo Test Stands, Bravo Skim Pond, and Alfa-Bravo Skim Pond

The Bravo Test Stands (Historical Test Stands 2730 and 2731) are located in Area II of SSFL (Figures ES-2, 2-9, and 2-10). The test stands were constructed from 1955 to 1956 and were historically used for engine testing, maintenance, and cleaning. The PA identified the Bravo Test Stands as potential PFAS release locations and recommended them for further investigation because of the use of the PFAS-containing materials, including Braycote hydraulic oil and a chlorofluorocarbon cleaning solution.

The Bravo Skim Pond and Alfa-Bravo Skim Pond are located in Area II of SSFL (Figures ES-2, 2-9, and 2-10). The skim ponds were constructed in 1956 and were used to collect liquid waste from the Alfa and/or Bravo Test Stands. The Alfa-Bravo Skim Pond was closed in 1994. The Bravo Skim Pond has a 150,000-gallon capacity and the Alfa-Bravo Skim Pond has a 200,000-gallon capacity. These ponds are unlined retention ponds used for the collection of spent cooling water and residual trichloroethene from the Alfa and/or Bravo Test Stand testing and cleaning activities. The skim ponds are inactive and dry.

The PA identified the Bravo Test Stands, Bravo Skim Pond, and Alfa-Bravo Skim Pond as potential PFAS release areas and recommended them for further investigation because of use of Braycote hydraulic oil and chlorofluorocarbons that may have been transported from the Alfa and/or Bravo Test Stands to the skim ponds.

2.1.6 Coca Test Stands and Coca Skim Pond

The Coca Test Stands (Historical Test Stands 2733, 2734, and 2787) are located in Area II of SSFL (Figures ES-2, 2-11, and 2-12). The test stands were constructed from 1955 to 1956 and were historically used for engine testing, maintenance, and cleaning.

The Coca Skim Pond is located in Area II of SSFL (Figures ES-2, 2-11, and 2-12). The skim pond was constructed in 1956 and was used to collect liquid waste from the Coca Test Stands. The Coca Skim Pond has a 300,000-gallon capacity. This pond is an unlined retention pond constructed for spent cooling water and residual trichloroethene from the testing and cleaning activities. The skim pond is inactive and dry; however, surface water collects during the rainy season.

The PA identified the Coca Test Stands and Skim Pond as potential PFAS release areas and recommended them for further investigation because of the use of the PFAS-containing materials, including Braycote hydraulic oil and a chlorofluorocarbon cleaning solution that might have been transported from the Coca Test Stands to the Coca Skim Pond.

2.1.7 Delta Test Stands and Delta Skim Pond

The Delta Test Stands (Historical Test Stands 2736, 2737, and 2738) are located in Area II of SSFL (Figures ES-2, 2-13, and 2-14). The test stands were constructed from 1955 to 1956 and were historically used for engine testing, maintenance, and cleaning.

The Delta Skim Pond is located in Area II of SSFL (Figures ES-2, 2-13, and 2-14). The skim pond was constructed in 1956 and was used to collect liquid waste from the Delta Test Stands. The Delta Skim Pond has a 725,000-gallon capacity. This is an unlined retention pond for collection of spent cooling water and residual trichloroethene from the Delta Test Stands testing and cleaning activities. The Delta Skim Pond is inactive and dry and was closed in 1994.

The PA identified the Delta Test Stands and Delta Skim Pond as potential PFAS release areas and recommended them for further investigation because of the use of the PFAS-containing materials,

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including Braycote hydraulic oil and a chlorofluorocarbon cleaning solution that might have been transported from the Delta Test Stands to the Delta Skim Pond.

2.2 Environmental Setting

This section provides the environmental setting of SSFL.

2.2.1 Climate

The climate at SSFL and the surrounding area falls within the Mediterranean sub-classification, and monthly mean temperatures range from 50 degrees Fahrenheit (°F) during winter months to 70°F during summer months (SAIC 1994). The Mediterranean climate of southern California is typified by dry conditions in the late spring through early fall, with the majority of precipitation occurring in the late fall through early spring. Historically, precipitation has been affected by the El Niño–Southern Oscillation, a periodic variation in winds and ocean surface temperatures in the eastern Pacific Ocean resulting in cycles of above- and below-average annual precipitation. Precipitation at SSFL has ranged from 5.7 to 41.2 inches, averaging approximately 17.1 inches (NASA 2020). In general, groundwater levels, particularly in the near-surface groundwater (NSGW) system, increase during periods of higher precipitation and decrease during drier periods, such as drought conditions earlier this decade in California. The temporal variability of deep percolation of precipitation to groundwater is controlled by climatic conditions. The spatial distribution of deep percolation of precipitation is influenced by physical factors such as topography, type and extent of vegetation, soil moisture, extent of alluvium/overburden and weathered bedrock, and bedrock lithology and structure.

2.2.2 Topography

SSFL occupies approximately 2,850 acres of hilly terrain that expresses approximately 1,100 feet of topographic relief near the crest of the Simi Hills. The highest surface elevation at SSFL occurs near the center of the site at an approximate elevation of 2,245 feet above mean sea level.

2.2.3 Geologic Setting

The Cretaceous Chatsworth Formation is one of the oldest and most extensively exposed units in the Simi Hills and directly underlies most of SSFL. It is a roughly 70-million-year-old and greater than 2,000-foot-thick composite turbidite sequence of sandstone interbedded with shale, siltstone, and conglomerate deposited in a sand-rich environment at water depths between 600 and 3,000 feet. In the vicinity of SSFL, defined coarse-grained units are typically several hundred feet thick with discontinuous fine-grained interbeds that are 5 to 20 feet thick. Fine-grained units generally contain 50% or more interbedded siltstone and shale and range between 15 and 300 feet thick. Individual sandstone beds range in thickness from roughly 1 inch to 30 feet or more but are typically 1 to 5 feet thick. Intervals of stacked sandstone beds with few or no fine-grained interbeds typically reach tens of feet thick and may extend laterally for several thousand feet. Coarse-grained beds also include thinner and less extensive lenses of conglomerate that generally are less than several feet thick. Individual fine-grained beds are generally less than 3 feet thick.

Overlying the competent Chatsworth Formation bedrock is a relatively thin (5 to 25 feet thick) veneer of alluvium and weathered bedrock. This surficial unit is highly variable in thickness across the site, tends to occur in surface water drainages and other topographically protected areas, and is absent in many exposed areas (NASA 2020). Exposures of resistant and massive upturned sandstone form topographic ridges, whereas exposures with a higher proportion of fine-grained material erode to more planar features.

Relatively flat-lying areas typically are covered by 1 to 30 feet of unconsolidated material, including soils, colluvium, alluvium, highly weathered bedrock, and placed fill in developed areas.

2.2.4 Hydrogeologic and Hydrologic Setting

The aquifer system beneath SSFL can be divided into two general categories (NASA 2020):

- Shallow groundwater occurring within the alluvium and weathered bedrock that is perched above the competent bedrock aquifer or continuous with (that is, in communication with) the competent bedrock aquifer (for example, NSGW)
- Groundwater occurring in the competent bedrock aquifer (for example, the Chatsworth Formation Groundwater [CFGW])

Precipitation that falls on the site evaporates, flows offsite via surface drainages, or infiltrates into the shallow subsurface. Groundwater recharge to the aquifer system originates as infiltration through the ground surface, flows through alluvial and/or weathered bedrock where present, and continues downward migrating through a network of interconnected fractures in the competent Chatsworth Formation bedrock aquifer. The recharge causes groundwater to mound beneath SSFL and generates static groundwater levels hundreds of feet above the surrounding valleys. Once this infiltrating water encounters the saturated bedrock, it generally migrates three-dimensionally, both to the deeper regional aquifers and toward—and potentially discharging to—seeps, springs, and/or phreatophytes located along the SSFL perimeter (MWH 2009).

Surface water that collects and drains at SSFL is intermittent and is conveyed offsite via one of four drainages: the Northwestern Drainage, the Northern Drainage, the Happy Valley Drainage, and the Bell Creek Drainage.

Neither surface water nor groundwater are currently used as drinking water sources at SSFL (NASA 2020).

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3. Field Investigation Methodology

The following section outlines the PFAS groundwater and soil sampling field work completed from March to November 2022. Before field work, groundwater and soil sampling instructions were created that outlined the sampling details, procedures, sampling order, California State Water Quality Control Board precautions to avoid compromising sampling integrity, a list of PFAS-containing materials to avoid during sampling to avoid cross-contamination, and work area setup diagrams to guide the field efforts.

3.1 Site Preparation and Utility Clearance

Before intrusive activities (soil sampling), a third-party utility clearance subcontractor conducted a geophysical utility survey to locate and demarcate subsurface utility lines near each proposed PFAS soil sampling location. Additionally, utility locate tickets were submitted to Underground Service Alert, Southern California, and private and state entities marked their respective utilities (if any) near the proposed soil sample collection locations. A cultural survey of soil sampling locations was also performed, and a Native American Monitor was present for all soil-disturbance activities.

A biological survey and vegetation clearance were performed at the groundwater sampling wells and applicable soil sampling locations to allow field work access. Vegetation was cleared using a gas-powered blower, weed whackers, and manual loppers.

3.2 Groundwater Level Measurements

Groundwater level measurements were collected before mobilization to identify dry wells, and again before sampling each well. Groundwater level data are included in Table 3-1.

3.3 Groundwater Sampling

Groundwater samples were collected from 25 existing groundwater monitoring wells (Figures 2-1, 2-3, 2-5, 2-7, 2-9, 2-11, and 2-13) under low-flow/low-stress conditions with a portable PFAS-free bladder pump, peristaltic pumps with PFAS-free disposable tubing, or from individual Flexible Liner Underground Technologies (FLUTE) ports. The pump intake was placed at the middle of the well screen interval. Prior to collecting the sample, depth-to-water readings and water quality parameters (WQPs) were measured and recorded (approximately every 5 minutes) using a depth-to-water meter and water quality meter, which were calibrated daily (at a minimum). Sampling began when a system volume was purged and WQPs had stabilized for three consecutive readings, as follows:

- Temperature within 0.2 degrees Celsius (°C)
- pH within 0.1 pH units
- Conductivity within 3%
- Dissolved oxygen within 10%
- Oxidation-reduction potential within 10 millivolts
- Turbidity measurements less than 10 nephelometric turbidity units or within 10%

Once met, WQPs were recorded prior to sample collection. WQPs are included in Table 3-1.

Groundwater was collected in laboratory-supplied high-density polyethylene (HDPE) bottles and placed into coolers containing enough ice to keep the samples 0 to 6°C (but not frozen) or in a sample

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refrigerator (checked for temperature daily) until they were received by the laboratory. Field quality assurance (QA) and quality control (QC) samples and frequencies are discussed in Section 3.5.

To avoid introducing PFAS during groundwater sampling, PFAS-containing equipment and components were not used, in accordance with SWRCB guidance. The use of PFAS-containing clothing and sunscreen, insect repellent, and other personal hygiene products that may contain PFAS was avoided.

Analytical data tables for groundwater are provided in Tables 3-2 and 3-3.

3.4 Soil Sampling

Surface soil samples were collected at approximately 0 to 2 feet below ground surface (bgs), and subsurface soil samples were collected from the bottom 2 feet of each boring (up to 8 feet bgs if refusal was not encountered) (Figures 2-2, 2-4, 2-6, 2-8, 2-10, 2-12, and 2-14). Surface and subsurface soil samples were collected using either the hand-auger or direct-push technology (DPT) methods. The hand-auger method was used for sample locations not accessible by DPT. Hand-auger samples were collected using a clean 2.5-inch-diameter stainless-steel hand auger bucket for surface samples, and a clean 2-inch-diameter hand-auger bucket for subsurface soil samples. DPT soil samples were collected using a clean 2.25-inch-outer-diameter Macro-Core sampling tool with 2-inch-inside-diameter disposable acetate liners containing undisturbed soil core samples. Soil boring logs are included in Appendix A.

Soil samples collected via hand-auger and DPT methods were containerized in laboratory-supplied 4-ounce HDPE jars using reusable and decontaminated single-use dedicated equipment. To preserve the samples, the sample jars were placed into coolers containing enough ice to keep the samples 0 to 6°C (but not frozen) or in a sample refrigerator (checked for temperature daily), until they were received by the laboratory. Field QA/QC samples and frequencies are discussed in Section 3.5.

To avoid introducing PFAS during soil sampling, PFAS-containing equipment and components were not used, in accordance with SWRCB guidance. The use of PFAS-containing clothing and sunscreen, insect repellent, and other personal hygiene products that may contain PFAS was avoided.

Analytical data tables for soil are located in Tables 3-4 and 3-5.

3.5 Quality Assurance and Quality Control

Field QA/QC samples were collected during sampling, in accordance with the SI WP (NASA 2022) and SWRCB PFAS guidance. These samples were obtained to:

- Confirm that disposable and reusable sampling equipment were free of PFAS
- Evaluate field methodology
- Establish ambient field background conditions
- Evaluate whether cross-contamination occurred during sampling and/or shipping

Field QA/QC samples were collected as follows and discussed further in the data quality assessment reports (Appendix B):

- Equipment rinse blank samples were collected from personal protective equipment, pump tubing, and decontaminated sampling equipment. Sampling equipment blanks were collected once per day during soil and groundwater sampling, where warranted. A total of 28 equipment blanks were collected during the sampling events.

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- Field blank samples were collected at a rate of two field blanks per week during the sampling events. The first field blank was collected at the first sampling location for each event, and subsequent field blanks were collected at separate AOPCs at the discretion of the FTL. A total of 10 field blanks were collected during the sampling events (groundwater and soil).
- Field duplicate samples were collected at the frequency of one per 10 normal field samples of similar matrix. Three field duplicates were collected during groundwater sampling. Two field duplicate samples were collected during soil sampling.
- Matrix spike (MS) and matrix spike duplicate (MSD) samples were collected at a rate of one for every 20 environmental samples collected (or greater than or equal to 5% of the samples collected) per medium, including field duplicates. Two MS/MSDs were collected during groundwater sampling. Two MS/MSDs were collected during soil sampling.

3.6 Sample Packaging and Shipping

Samples were stored in coolers on ice or in a sample refrigerator following collection with a corresponding chain-of-custody. Coolers were then managed, secured, and shipped on ice via FedEx to Eurofins TestAmerica, West Sacramento, California, for analysis. During shipment, precautions were taken to monitor and track the shipments and coordinate arrival with the lab.

3.7 Decontamination Procedures

Decontamination activities, including decontaminating nondisposable equipment, were conducted in accordance with the standard operating procedures (SOPs) provided in the SI WP (NASA 2022) and SWRCB PFAS guidance.

Water generated while decontaminating sampling equipment was collected and disposed as investigation-derived waste (IDW), as described in Section 3.8. Disposable sampling equipment and personal protective equipment, such as HDPE tubing and nitrile gloves, were also disposed as IDW.

Reusable heavy equipment, such as drilling rods and augers, were decontaminated before and after collecting each sample. The fluid generated was disposed as IDW. Heavy equipment decontamination procedures were conducted in accordance with the SOP provided in the SI WP (NASA 2022).

3.8 Investigation-derived Waste Management

IDW generated during the SI included drill cuttings generated during soil boring advancement, purge water from groundwater sampling, decontamination fluids, disposable sampling equipment, and personal protective equipment. Solid IDW was contained in drums, and aqueous IDW was containerized into three new 275-gallon poly totes. Containers were properly sealed, labeled, and staged within a NASA-approved staging area.

IDW was managed in accordance with the Sitewide Waste Management Plan (CH2M 2020).

3.9 Laboratory Analysis and Data Usability Assessment

Groundwater and soil samples were submitted to Eurofins TestAmerica, West Sacramento, California, a DoD Environmental Laboratory Accreditation Program–accredited laboratory, in accordance with chain-of-custody procedures. Analytical data are tabulated in Tables 3-2 through 3-5.

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Samples were analyzed for the following 18 PFAS compounds listed in Method 537.1 via liquid chromatography tandem mass spectrometry compliant with Quality Systems Manual 5.3 Table B-15 (DoD 2019):

- Perfluorobutanoic acid (PFBS)
- Perfluorooctane sulfonate (PFOS)
- Perfluorooctanoic acid (PFOA)
- Perfluorodecanoic acid (PFDA)
- Perfluorododecanoic acid (PFDoA)
- Perfluoroheptanoic acid (PFHpA)
- Perfluorohexane sulfonate (PFHxS)
- Perfluorohexanoic acid (PFHxA)
- Perfluorononanoic acid (PFNA)
- Perfluorotetradecanoic acid (PFTA)
- Perfluorotridecanoic acid (PFTrDA)
- Perfluoroundecanoic acid (PFUnA)
- 4,8-Dioxa-3H-perfluorononanoic acid (ADONA)
- 9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)
- 11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)
- N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)
- N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)
- Hexafluoropropylene oxide dimer acid (HFPO-DA)

After laboratory analysis of samples was complete, data usability was assessed. Data validation was conducted by the program chemist. Data were then verified, and a Data Usability Assessment was completed for groundwater and soil PFAS analytical results (Appendix B). The data validation review demonstrated that the analytical systems were generally in control, and data results can be used in the project decision-making process. Additionally, no sample interferences (for example, false positives) were noted in equipment blanks, indicating that the sample materials selected and the SOPs followed yielded data representative of the sampled media.

3.10 Deviations from the Work Plan

The following field procedures deviated from the SI WP (NASA 2022):

- Well RD-26 groundwater was sampled twice. One sample at RD-26 was collected using a portable pump while the dedicated pump was installed. During removal of the portable pump, the tubing became entangled and had to be removed at a later date. The well was resampled using a new portable pump after removal of both dedicated and portable pumps to evaluate if the fallen pump did not impact the PFAS result from the well.
- Building 2206 soil sample locations EVBS2001 and EVBS2002 were moved because the original sample locations were not safe to access (too close to a rocky cliff). The samples were moved to the base of the cliff, downgradient from the original sample location in obvious runoff pathways (Figure 2-4).
- Before the sampling event, well RD-83 had a pump that had fallen into the well. The sampling of well RD-83 was postponed until the pump and tubing could be retrieved. Following removal of this pump, the well was sampled.

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Other changes to the primary sampling plan that were covered and allowed by the SI WP included the following:

- If refusal was met at or above 2 feet bgs, a second, deeper soil sample below 2 feet bgs was not collected.
- In the SI WP, there were special conditions regarding the water levels in PZ-017A, PZ-017B, PZ-045, PZ-046, PZ-125, PZ-133, PZ-134, PZ-135, PZ-136, PZ-137, and PZ-146. The final sample locations were based on available groundwater for sampling at the time of the event. Per the conditions of the SI WP, the following wells were included as backups in the sampling list in lieu of dry wells or wells with only endcap water:
 - ND-126, ND-113-1, RD-81-1, RD-82, and RD-83 were not sampled.
 - PZ-047 and PZ-017B were not sampled because a groundwater sample was successfully collected at PZ-017A.
 - Because PZ-045 was successfully sampled, sampling FLUTE well ND-114-1 was not attempted.
 - PZ-049, PZ-125, PZ-133, PZ-135, and PZ-146 were recorded as dry and were not sampled.
 - PZ-004A, PZ-004B, PZ-046, PZ-134, PZ-136, PZ-137, and PZ-147 had only endcap water and sampling was not attempted.

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4. Field Investigation Results

The details of the data evaluation, basis for recommendations, and SSFL boundary proximity assessment are described in this section. The analytical results for groundwater and soil were compared to residential scenario tap water and soil SLs for PFOA, PFOS, PFBS, PFHxS, HFPO-DA and PFNA presented in Section 1.2.

Groundwater samples were collected from existing wells in each AOPC in both the NSGW and CFGW water-bearing units. PFAS were detected in 21 groundwater samples; 19 groundwater samples exceeded various SLs (Table 4-1). Surface and subsurface soil samples were also collected in each AOPC. PFAS were detected in 17 surface soil samples and 6 subsurface soil samples; however, none of the surface or subsurface soil samples exceeded the SLs (Table 4-2). The results for PFOA, PFOS, PFBS, PFHxS, HFPO-DA, and PFNA in groundwater are presented for each of the investigation areas on Figures 2-1, 2-3, 2-5, 2-7, 2-9, 2-11, and 2-13 and in Table 4-1. The results for PFOA, PFOS, PFBS, PFHxS, HFPO-DA, and PFNA in soil are presented for each of the investigation areas on Figures 2-2, 2-4, 2-6, 2-8, 2-10, 2-12, and 2-14 and in Table 4-2. The results are summarized by AOPC in the following sections. Analytical data tables are provided in Tables 3-2 through 3-5.

4.1 Area II Landfill

4.1.1 Background

The Area II Landfill is located near the central northern border of SSFL (within 0.1 mile). Disposal of drums of unknown contents were disposed of at the Area II Landfill. Shallow soil generally consists of sand and silt, and soil boring logs are provided in Appendix A. Surface water at the Area II Landfill follows the topography in the area. Surface water that collects and drains in this area is intermittent and is conveyed offsite via the Northern Drainage. Refer to Section 2.1.1 for the description and operational history of the Area II Landfill.

The groundwater at SSFL is not used as drinking water. Groundwater samples were collected from existing CFGW monitoring wells (RD-81-1, RD-82, RD-83, and ND-126) screened in the CFGW aquifer at the Area II Landfill. These wells were selected as being downgradient of any likely PFAS release area and were biased toward topographically low areas and surface water drainage features (Figure 2-1).

Two surface soil samples were collected from 0 to 2 feet bgs and one subsurface soil sample from 6 to 8 feet bgs (A2BS1244S002 was not collected; refusal was encountered). The locations were targeting topographically low areas and surface water drainage features (Figure 2-2).

4.1.2 Groundwater and Soil Sampling Results

4.1.2.1 Groundwater

Table 4-3 provides a summary of the Area II Landfill results from the PFAS investigation. PFOA was detected in CFGW samples above the SLs. PFBS and PFNA were detected in groundwater below the SLs. PFOS, PFHxS, and HFPO-DA was not detected in groundwater.

4.1.2.2 Soil

PFOA, PFOS, and PFNA were detected in soil below the SLs. PFBS, PFHxS, and HFPO-DA were not detected in soil. PFOA, PFOS, PFNA, PFBS, PFHxS, and HFPO-DA are the only PFAS that currently have SLs. Analytical results are presented in Tables 3-4 and 3-5.

4.1.3 Conclusions and Recommendations

Further evaluation of this area is not recommended at this time based on the following lines of evidence:

- Only one groundwater sampling location (RD-81-1) was above the screening level, 0.0068 µg/L versus a SL of 0.006 µg/L for PFOA.
- The one low-level detection, coupled with the lack of soil exceedances, does not indicate a significant PFAS impact warranting further characterization.

4.2 Building 2206

4.2.1 Background

Building 2206 is located near the central northern border of SSFL (within 0.1 mile of the northern undeveloped area boundary). The groundwater at SSFL is not used as drinking water. Shallow soil generally consists of sand and silt, and soil boring logs are provided in Appendix A. Surface water that collects and drains in this area is intermittent and is conveyed offsite via the Northern Drainage. Surface water at Building 2206 flows to the north and south following the topography in the area. Refer to Section 2.1.2 for the description and operational history of Building 2206.

Groundwater samples at this site were collected from existing groundwater monitoring wells screened in the NSGW and CFGW aquifers (PZ-140 [NSGW] and ND-125-1 [CFGW]). These wells were selected as being downgradient of any likely PFAS release area and were biased toward topographically low areas. (Figure 2-3).

Three shallow soil samples were collected from three locations from 0 to 0.75 foot bgs, 0 to 1.6 feet bgs, and 0 to 2 feet bgs (no subsurface samples were collected; refusal was encountered). The locations were biased toward topographically low areas and surface water drainage features (Figure 2-4).

4.2.2 Groundwater and Soil Sampling Results

4.2.2.1 Groundwater

Table 4-4 provides a summary of the Building 2206 results from the PFAS investigation. PFOA and PFOS were detected in NSGW and CFGW samples above the SLs. PFBS, PFHxS, and PFNA were detected in groundwater below the SLs. HFPO-DA was not detected in groundwater.

4.2.2.2 Soil

PFOA, PFOS, and PFNA were detected in soil below the SLs. PFBS, PFHxS, and HFPO-DA were not detected in soil. PFOA, PFOS, PFNA, PFBS, PFHxS, and HFPO-DA are the only PFAS that currently have SLs. Analytical results are presented in Tables 3-4 and 3-5.

4.2.3 Conclusions and Recommendations

Further evaluation of groundwater (at other existing groundwater monitoring wells in the area), and further evaluation of soil is recommended based on the following lines of evidence:

- Concentrations of PFOA and PFOS exceeded the SLs in groundwater by several orders of magnitude in both locations sampled.
- Metal plating might have occurred at this location and used PFAS-containing materials.

4.3 Area II Sewage Treatment Plant and Building 2207

4.3.1 Background

The Area II STP and Building 2207 is located near the central northern border of SSFL (within 0.35 mile of the northern undeveloped area boundary). AFFF was stored at Building 2207 and the Area II STP received waste from the ELV Service Area, including Building 2207. The groundwater at SSFL is not used as drinking water. Shallow soil generally consists of sand and silt, and soil boring logs are provided in Appendix A. Surface water at the Area II STP and Building 2207 follows the topography in the area. Surface water that collects and drains in this area is intermittent and is conveyed offsite via the Northern Drainage. Refer to Sections 2.1.3 and 2.1.4 for the description and operational history of Building 2207 and the STP.

Groundwater samples at this site were collected from existing wells screened in the CFGW aquifer. Two groundwater samples were collected from an existing CFGW monitoring well (RD-26) at Building 2207 (refer to Section 3.10). This well was selected to evaluate the presence of PFAS within the CFGW (Figure 2-5).

Four surface soil samples were collected from 0 to 0.75 feet bgs, 0 to 1.6 feet bgs, 0 to 2 feet bgs, and 3 subsurface soil samples from 2.5 to 4 feet bgs, 4 to 6 feet bgs, and 6 to 8 feet bgs (subsurface samples from one location were not collected; refusal was encountered). The locations were selected within the footprints of the buildings and along surface water drainage features (Figure 2-6).

4.3.2 Groundwater and Soil Sampling Results

4.3.2.1 Groundwater

Table 4-5 provides a summary of the Area II STP and Building 2207 results from the PFAS investigation. PFOA and PFOS were detected in the CFGW sample above the SLs. PFBS, PFHxS, and PFNA were detected in groundwater below the SLs. HFPO-DA was not detected in groundwater.

4.3.2.2 Soil

PFOA, PFOS, and PFNA were detected in soil below the SLs. PFBS, PFHxS, and HFPO-DA were not detected in soil. PFOA, PFOS, PFNA, PFBS, PFHxS, and HFPO-DA are the only PFAS that currently have SLs. Analytical results are presented in Tables 3-4 and 3-5.

4.3.3 Conclusions and Recommendations

Further evaluation of groundwater (at other existing groundwater monitoring wells in the area), and further evaluation of soil is recommended based on the following lines of evidence:

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- Concentrations of PFOA and PFOS exceeded the SLs in groundwater; PFOS by an order of magnitude.
- There is documentation the AFFF being stored at Building 2207 and the Area II STP receives waste from that building along with other areas of the ELV and Service Area.

4.4 Alfa Test Stands, Alfa Retention Pond, and Alfa Skim Pond

4.4.1 Background

The Alfa Test Stands and Alfa Skim Pond are located in central SSFL (at least 0.5 miles from the nearest SSFL boundary). The groundwater at SSFL is not used as drinking water. Surface water at the Alfa Test Stands follows the topography and drainage in the area and collects in the Alfa Skim Pond. Surface water that collects and drains in this area is intermittent and is conveyed offsite via the Bell Creek Drainage. Shallow soil generally consists of sand and silt, and soil boring logs are provided in Appendix A. Refer to Sections 2.1.5 and 2.1.6 for the description and operational history of the Alfa Test Stands, Alfa Retention Ponds, and Alfa Skim Pond. The test stands used Braycote hydraulic oil, which is known to be a PFAS-containing material. It was also commonplace to use a chlorofluorocarbon cleaning solution, which is known to be a PFAS-containing material, at the test stands. Waste from the use of this oil and cleaning solution may have been released at the site and transported to the skim ponds.

Groundwater samples were collected from five existing groundwater monitoring wells (NSGW: HAR-11, HAR-20, RD-49A, and PZ-154; CFGW: RD-49B) at the Alfa Test Stands, Alfa Retention Pond, and Alfa Skim Pond in the NSGW and CFGW aquifers. These wells were selected to evaluate the presence of PFAS within the CFGW and the NSGW (Figure 2-7).

Four surface soil samples were collected from four locations from 0 to 1.4 feet bgs, 0 to 1.8 feet bgs, 0 to 2 feet bgs, 0 to 2.1 feet bgs, and one subsurface soil sample from 4.6 to 6.6 feet bgs (subsurface samples from three locations were not collected; refusal was encountered). The locations were selected along surface water drainage features (Figure 2-8).

4.4.2 Groundwater and Soil Sampling Results

4.4.2.1 Groundwater

Table 4-6 provides a summary of the Alfa Test Stands, Alfa Retention Pond, and Alfa Skim Pond results from the PFAS investigation. PFOA and PFNA were detected in NSGW and CFGW samples above the SLs (with higher detections in NSGW). PFOS, PFBS, and PFHxS were detected in groundwater below the SLs. HFPO-DA was not detected in groundwater.

4.4.2.2 Soil

PFOA, PFOS, and PFNA were detected in soil below the SLs. PFBS, PFHxS, and HFPO-DA were not detected in soil. PFOA, PFOS, PFNA, PFBS, PFHxS, and HFPO-DA are the only PFAS that currently have SLs. Analytical results are presented in Tables 3-4 and 3-5.

4.4.3 Conclusions and Recommendations

Further evaluation of groundwater (at other existing groundwater monitoring wells in the area), and further evaluation of soil is recommended based on the following lines of evidence:

- Concentrations of PFOA and PFNA exceeded the SLs in groundwater; PFOA by an order of magnitude.

- There is documentation the PFAS-containing materials (Braycote hydraulic oil and chlorofluorocarbons) were used at the test stand locations.

4.5 Bravo Test Stands, Alfa-Bravo Skim Pond, and Bravo Skim Pond

4.5.1 Background

The Bravo Test Stands, Alfa-Bravo Skim Pond, and Bravo Skim Pond are located in central SSFL (at least 0.6 mile from the nearest SSFL boundary). The groundwater at SSFL is not used as drinking water. Surface water at the Bravo Test Stands follows the topography and drainage in the area and can collect in the Bravo Skim Pond. Surface water that collects and drains in this area is intermittent and is conveyed offsite via the Bell Creek Drainage. Shallow soil generally consists of sand and silt, and soil boring logs are provided in Appendix A. The test stands used Braycote hydraulic oil, which is known to be a PFAS-containing material. It was also commonplace to use chlorofluorocarbons as a cleaning solution, which is known to be a PFAS-containing material, at the test stands. Waste from the use of this oil and cleaning solution may have been released at the site and transported to the skim ponds. Refer to Sections 2.1.5 and 2.1.6 for the description and operational history of Bravo Test Stands, Alfa-Bravo Skim Pond, and Bravo Skim Pond.

Groundwater samples were collected from five existing groundwater monitoring wells (NSGW: HAR-09; CFGW: HAR-21, HAR-19, ND-135-1, and ND-134-1) at the Bravo Test Stands, Alfa-Bravo Skim Pond, and Bravo Skim Pond. These wells were selected to evaluate the presence of PFAS within the CFGW and the NSGW (Figure 2-9).

Two surface soil samples were collected from 0 to 1.8 feet bgs and 0 to 2 feet bgs, and one subsurface sample from 4 to 6 feet bgs. The locations were selected along the surface water drainage features (Figure 2-10).

4.5.2 Groundwater and Soil Sampling Results

4.5.2.1 Groundwater

Table 4-7 provides a summary of the Bravo Test Stands, Alfa-Bravo Skim Pond, and Bravo Skim Pond results from the PFAS investigation. PFOA and PFOS were detected in NSGW and CFGW samples above the SLs. PFBS and PFHxS were detected in groundwater below the SLs. PFNA and HFPO-DA were not detected in groundwater.

4.5.2.2 Soil

PFOA, PFOS, and PFNA were detected in soil below the SLs. PFBS, PFHxS, and HFPO-DA were not detected in soil. PFOA, PFOS, PFNA, PFBS, PFHxS, and HFPO-DA are the only PFAS that currently have SLs. Analytical results are presented in Tables 3-4 and 3-5.

4.5.3 Conclusions and Recommendations

Further evaluation of groundwater (at other existing groundwater monitoring wells in the area), and further evaluation of soil is recommended based on the following lines of evidence:

- Concentrations of PFOA and PFOS exceeded the SLs in groundwater; PFOA by an order of magnitude.

- There is documentation the PFAS-containing materials (Braycote hydraulic oil and chlorofluorocarbons) were used at the test stand locations.

4.6 Coca Test Stands and Coca Skim Pond

4.6.1 Background

The Coca Test Stands and Coca Skim Pond are located in central SSFL (at least 1 mile from the nearest SSFL boundary). The groundwater at SSFL is not used as drinking water. Surface water at the Coca Test Stands follows the topography and drainage in the area and collects in the Coca Skim Pond. Surface water that collects and drains in this area is intermittent and is conveyed offsite via the Bell Creek Drainage. Shallow soil generally consists of sand and silt, and soil boring logs are provided in Appendix A. The test stands used Braycote hydraulic oil, which is known to be a PFAS-containing material. It was also commonplace to use a chlorofluorocarbon cleaning solution, which is known to be a PFAS-containing material, at the test stands. Waste from the use of this oil and cleaning solution may have been released at the site and transported to the skim ponds. Refer to Sections 2.1.5 and 2.1.6 for the description and operational history of the Coca Test Stands and Coca Skim Pond.

Groundwater samples were collected from five existing groundwater monitoring wells (NSGW: PZ-017A, PZ-045, PZ-048; CFGW: ND-113-1 and RD-79) at the Coca Test Stands and Coca Skim Pond in the NSGW and CFGW aquifers. These wells were selected to evaluate the presence of PFAS within the CFGW and the NSGW (Figure 2-11).

Two surface soil samples were collected from two locations from 0 to 2 feet bgs, and subsurface soil from two locations from 6 to 8 feet bgs. The locations were selected along the surface water drainage features (Figure 2-12).

4.6.2 Groundwater and Soil Sampling Results

4.6.2.1 Groundwater

Table 4-8 provides a summary of the Coca Test Stands and Coca Skim Pond results from the PFAS investigation. PFOA, PFOS, and PFNA were detected in NSGW and CFGW samples above the SLs. PFBS and PFHxS were detected in groundwater below the SLs. HFPO-DA was not detected in groundwater.

4.6.2.2 Soil

PFOA and PFOS were detected in soil below the SLs. PFBS, PFHxS, HFPF-DA, and PFNA were not detected in soil. PFOA, PFOS, PFNA, PFBS, PFHxS, and HFPO-DA are the only PFAS that currently have SLs. Analytical results are presented in Tables 3-4 and 3-5.

4.6.3 Conclusions and Recommendations

Further evaluation of groundwater (at other existing groundwater monitoring wells in the area), and further evaluation of soil is recommended based on the following lines of evidence:

- Concentrations of PFOA, PFOS, and PFNA exceeded the SLs in groundwater.
- There is documentation that PFAS-containing materials (Braycote hydraulic oil and chlorofluorocarbons) were used at the test stand locations.

4.7 Delta Test Stands and Delta Skim Pond

4.7.1 Background

The Delta Test Stands and Delta Skim Pond is south and west of central of SSFL (at least 0.7 mile from the nearest SSFL boundary). The groundwater at SSFL is not used as drinking water. Surface water at the Delta Test Stands flows along the drainage pathways. Surface water that collects and drains in this area is intermittent and is conveyed offsite via the Bell Creek Drainage. The test stands used Braycote hydraulic oil, which is known to be a PFAS-containing material. It was also commonplace to use chlorofluorocarbons as a cleaning solution, which is known to be a PFAS-containing material, at the test stands. Waste from the use of this oil and cleaning solution may have been released at the site and transported to the skim ponds. Refer to Sections 2.1.5 and 2.16 for the description and operational history of the Delta Test Stands and Delta Skim Pond.

Groundwater samples were collected from two existing NSGW monitoring wells (HAR-27 and HAR-28) at the Delta Test Stands and Delta Skim Pond. These wells were selected to evaluate the presence of PFAS within the NSGW (Figure 2-13).

One surface soil sample was collected from 0 to 1.1 feet bgs (subsurface sample not collected due to shallow refusal). The sample was located at the intersection of multiple surface water runoff channels from the Delta Test Stands (Figure 2-14).

4.7.2 Groundwater and Soil Sampling Results

4.7.2.1 Groundwater

Table 4-9 provides a summary of the Delta Test Stands and Delta Skim Pond results from the PFAS investigation. PFOA was detected in one NSGW sample above the SL. PFOS, PFBS, and PFHxS were detected in groundwater below the SLs. HFPO-DA and PFNA were not detected in groundwater.

4.7.2.2 Soil

PFOA was detected in one soil sample below the SL. PFOS, PFBS, PFHxS, HFPO-DA and PFNA were not detected in soil. PFOA, PFOS, PFNA, PFBS, PFHxS, and HFPO-DA are the only PFAS that currently have SLs. Analytical results are presented in Tables 3-4 and 3-5.

4.7.3 Conclusions and Recommendations

Further evaluation of groundwater (at other existing groundwater monitoring wells in the area), and further evaluation of soil is recommended based on the following lines of evidence:

- Concentrations of PFOA exceeded the SL in groundwater.
- There is documentation the PFAS-containing materials (Braycote hydraulic oil and chlorofluorocarbons) were used at the test stand locations.

5. Conclusions and Recommendations

Exceedances of groundwater PFAS SLs were observed in both the NSGW and CFGW systems. The NSGW system is discontinuous and therefore, does not pose a concern for offsite migration. The CFGW exceedances are located at least 0.2 mile from the nearest downgradient property line. The groundwater concentrations are consistent with surface releases of PFAS.

No further action is recommended in groundwater and soil for the Area II Landfill AOPC.

Based on NASA precedent, further evaluation is warranted for groundwater for the remaining NASA SSFL AOPCs with PFAS exceedances above the SLs, with sites prioritized for work based on concentration levels. Further investigation could be accomplished by sampling groundwater from other existing wells proximal to the previously sampled monitoring wells that showed PFAS exceedances.

The presence of PFAS constituents in groundwater at levels exceeding the SLs does indicate that releases to surface soils have occurred at the site in the past, resulting in degradation of underlying groundwater quality. However, because of the very limited soil horizon present at SSFL, it is possible that the surface releases occurred onto exposed bedrock or in areas of very little soil residuum. Under these conditions, the mass of PFAS stored in the thin soil horizon might be inconsequential and might not represent an ongoing source impacting groundwater quality. Shallow refusal was encountered in the following six of the seven AOPCs resulting in reduced or no subsurface soil samples:

- Area II Landfill
- Building 2206
- Area II STP and Building 2207
- Alfa Test Stands, Alfa Retention Pond, and Alfa Skim Pond
- Bravo Test Stands, Bravo Skim Pond, and Alfa-Bravo Skim Pond
- Delta Test Stands and Delta Skim Pond

While there are detections of PFAS in soil, none exceeded the PFAS SLs. Further evaluation is recommended in soil for the NASA SSFL site based on the results of the PFAS SI and recognizing the potential limitations of shallow refusal and limited availability of soil in certain areas at SSFL.

The conclusions and recommendations from the SI are summarized in Table 5-1.

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Tables

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Table 3-1. Groundwater Sampling Information

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Date	Purge Equipment	Well Diameter (inches)	Depth to Water (feet btoc)	Well Screen or Open Borehole Interval (feet)	Depth to Pump (feet btoc)	Purge Volume (mL)	Sampling Drawdown (feet)	Temp (°C)	Specific Conductance (mS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mV)	Turbidity (NTU)	Color
HAR-09	6/6/2022	Peristaltic Pump and HDPE/Flex Tubing	4	17.49	16.1-30.5	24	2700	0.57	21.1	1.246	0.66	6.69	-61.9	2	clear
HAR-11	6/6/2022	Peristaltic Pump and HDPE/Flex Tubing	4	19.13	11.2-31	25.06	2400	0.57	20.4	1.811	0.71	6.45	38.6	2	clear
HAR-19	5/27/2022	Bladder Pump and HDPE tubing	10	175.06	30-220	197.53	5400	0.02	21.9	1.584	0.7	6.69	-36.8	2	clear
HAR-20	6/2/2022	Bladder Pump and HDPE tubing	8	173.59	30-230	201.8	3300	0.03	23.1	1.241	2.23	6.95	-21	2	clear
HAR-21	6/6/2022	Peristaltic Pump and HDPE/Flex Tubing	10	16.94	30-130	80	2700	0.1	20.1	1.639	0.65	7.03	-164.2	2	clear
HAR-27	6/1/2022	Bladder Pump and HDPE tubing	4	31.68	21-40	35.84	2400	0.25	20	1.753	0.49	6.57	-150.3	2	clear
HAR-28	5/31/2022	Bladder Pump and HDPE tubing	4	31.84	20-40	35.92	2400	0.22	None	1.226	1.95	6.56	-15	2	clear
ND-113	5/26/2022	FLUTE and HDPE tubing	6	Not measured	197-212	197-212	21150	0	23.6	1.236	0.99	6.76	-45.7	2	clear
ND-116	5/31/2022	FLUTE and HDPE tubing	6	Dry	130-145	130-145	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
ND-125	6/3/2022	FLUTE and HDPE tubing	3.78	47.13	190-205	190-205	6800	Not measured	22	1.794	2.31	6.95	-2.9	2	clear
ND-134	5/27/2022	FLUTE and HDPE tubing	3.78	28.09	275.5-291.5	275.5-291.5	10410	3.37	20.1	1.083	1.81	6.8	-42.7	1	clear
ND-135	5/31/2022	FLUTE and HDPE tubing	3.78	47.35	198-213	198-213	15350	4.11	19.7	1.357	3.01	6.85	106.1	1	clear
PZ-017A	5/26/2022	Peristaltic Pump and HDPE/Flex Tubing	2	8.24	7-17	12.62	2400	0.62	20.7	1.203	0.39	6.36	24.5	2	clear
PZ-045	5/27/2022	Bladder Pump and HDPE tubing	2	40.45	30-40	41.83	1800	0.41	17.8	0.37	0.91	5.63	20.2	2	clear
PZ-048	5/25/2022	Peristaltic Pump and HDPE/Flex Tubing	2	4.38	9-19	14	1800	0.26	22.3	1.372	0.91	6.54	-139	2	clear
PZ-140	6/3/2022	Bladder Pump and HDPE tubing	2	29.3	52-62	57	3000	1.02	22.1	0.838	0.79	6.51	-20.9	2	clear
PZ-154	6/1/2022	Bladder Pump and HDPE tubing	2	59.41	50-60	60.23	2400	0.17	28.2	1.741	2.06	6.86	193	128	clear
RD-26	6/7/2022	Bladder Pump and HDPE tubing	8	131.07	30-160	145.53	3600	0	22.4	0.815	2.23	6.96	-53.9	3	clear
RD-26	7/28/2022	Bladder Pump and HDPE tubing	8	131.52	30-160	146	3000	0	23.7	0.882	1.84	6.77	1.8	2	clear
RD-49A	6/1/2022	Peristaltic Pump and HDPE/Flex Tubing	8	25.29	18.5-50	38.64	2100	0.09	23	2.219	0.57	6.75	-180.8	2	clear
RD-49B	6/2/2022	Bladder Pump and HDPE tubing	6	209.11	250-298	274	6750	0.03	20.5	0.413	1.23	8.36	-107.2	3	clear
RD-79	5/25/2022	Bladder Pump and HDPE tubing	12	6.52	10-55	32.5	7200	0.02	18.6	1.155	0.73	6.86	-102	14	clear
RD-81	5/24/2022	FLUTE and HDPE tubing	4	44.17	114-129	114-129	17150	0	18.2	1.407	2.71	6.99	37.5	1	clear
RD-82	5/25/2022	Bladder Pump and HDPE tubing	8	43.37	20-197	120.5	5400	0.01	18.8	1.124	0.5	6.66	-77.9	2	clear
RD-83	7/29/2022	Bladder Pump and HDPE tubing	8	39.72	20-143	91.5	4500	0.18	19.9	0.934	0.37	7.02	-47.8	3	clear

Notes:

Data from Survey123 software from tablet used to collected groundwater sampling field information. Table excludes FLUTE wells which are captured on separate groundwater sampling sheets in Appendix A.

°C = degrees Celsius

btoc = below top of casing

FLUTE = Flexible Liner Underground Technologies

HDPE = high density polyethylene

mg/L = milligram(s) per liter

mL - milliliter(s)

mS/cm - milliSiemen(s) per centimeter

mV = millivolt(s)

NTU = Nephelometric Turbidity unit(s)

ORP = oxidation reduction potential

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Table 3-2. NASA SSFL PFAS Groundwater Data Results

Site Investigation Report for Per- and Polyfluoroalkyl
Substances in Soil and Groundwater, Santa Susana Field
Laboratory, Ventura County, California

Analyte	CAS	Unit	HAR-09 ^[a]	HAR-11 ^[a]	HAR-19 ^[a]	HAR-20 ^[a]	HAR-21 ^[a]	HAR-27 ^[a]	HAR-28 ^[a]	ND-113-1 ^[a]	ND-125-1 ^[a]	ND-126 ^[a]	ND-134-1 ^[a]	ND-135-1 ^[a]	PZ-017A ^[a]
			HAR09GW01S020 16.1 to 30.5 6/6/2022	HAR11GW01S022 11.2 to 31 6/6/2022	HAR19GW01S030 30 to 220 5/27/2022	HAR20GW01S023 30 to 230 6/2/2022	HAR21GW01S019 30 to 130 6/6/2022	HAR27GWS014 21 to 40 6/1/2022	HAR28GW01S021 20 to 40 5/31/2022	ND113GW01S014 197 to 212 5/26/2022	ND125GW01S014 190 to 205 6/3/2022	ND126GWS013 20 to 205 5/23/2022	ND134GW01S014 275.5 to 291.5 5/27/2022	ND135GW01S024 198 to 213 5/31/2022	PZ017AGWS003 7 to 17 5/26/2022
102FTSA	120226-60-0	µg/L	0.00042 U	0.00042 U	0.00037 U	0.00041 U	0.0024 U	0.00038 U	0.00037 U	0.00039 U	0.00042 SU	0.00038 U	0.00039 U	0.00037 U	0.00038 U
11CLPF3OUDSA	763051-92-9	µg/L	0.00043 U	0.00043 U	0.00038 U	0.00042 U	0.0024 U	0.00039 U	0.00038 U	0.0004 U	0.00043 SU	0.00039 U	0.0004 U	0.00038 U	0.00039 U
3:3 FTCA	356-02-5	µg/L	0.00039 U	0.00038 U	0.00034 U	0.00038 U	0.0022 U	0.00035 U	0.00034 U	0.00036 U	0.00039 SU	0.00035 U	0.00036 U	0.00034 U	0.00035 U
42FTSA	757124-72-4	µg/L	0.00032 U	0.00032 U	0.00028 U	0.00032 U	0.0018 U	0.00029 U	0.00028 U	0.0003 U	0.00032 SU	0.00029 U	0.0003 U	0.00028 U	0.00029 U
5:3 FTCA	914637-49-3	µg/L	0.0003 U	0.0003 U	0.00026 U	0.00029 U	0.0017 U	0.00027 U	0.00026 U	0.00027 U	0.011^ S	0.00027 U	0.00027 U	0.00026 U	0.00027 U
62FTSA	27619-97-2	µg/L	0.00034 U	0.00034 U	0.0003 U	0.00034 U	0.0019 U	0.00031 U	0.0003 U	0.0028^ J	0.0023^ SJ	0.00031 U	0.00031 U	0.0003 U	0.00031 U
7:3 FTCA	812-70-4	µg/L	0.00049 U	0.00049 U	0.00043 U	0.00049 U	0.0028 U	0.00045 U	0.00043 U	0.00045 U	0.00049 SU	0.00044 U	0.00045 U	0.00043 U	0.00045 U
82FTSA	39108-34-4	µg/L	0.00056 U	0.00055 U	0.00049 U	0.00055 U	0.0031 U	0.0005 U	0.00049 U	0.00051 U	0.00056 SU	0.0005 U	0.00051 U	0.00049 U	0.00051 U
9CLPF3ONSA	756426-58-1	µg/L	0.00038 U	0.00038 U	0.00033 U	0.00037 U	0.0021 U	0.00034 U	0.00033 U	0.00035 U	0.00038 SU	0.00034 U	0.00035 U	0.00033 U	0.00034 U
ADONA	919005-14-4	µg/L	0.00046 U	0.00046 U	0.0004 U	0.00045 U	0.0026 U	0.00041 U	0.0004 U	0.00042 U	0.00046 SU	0.00041 U	0.00042 U	0.0004 U	0.00042 U
HFPODA	13252-13-6	µg/L	0.00062 U	0.00062 U	0.00054 U	0.00061 U	0.0035 U	0.00056 U	0.00054 U	0.00057 U	0.00062 SU	0.00056 U	0.00057 U	0.00055 U	0.00056 U
NETFOSA	4151-50-2	µg/L	0.00067 U	0.00066 U	0.00058 U	0.00065 U	0.0037 U	0.0006 U	0.00058 U	0.00061 U	0.00067 SU	0.0006 U	0.00061 U	0.00059 U	0.00061 U
NETFOSAA	2991-50-6	µg/L	0.00031 U	0.0003 U	0.00027 U	0.0003 U	0.0017 U	0.00028 U	0.00027 U	0.00028 U	0.00031 SU	0.00027 U	0.00028 U	0.00027 U	0.00028 U
NETFOSE	1691-99-2	µg/L	0.00065 UJ	0.00064 U	0.00057 U	0.00064 U	0.0036 U	0.00058 U	0.00056 U	0.0006 U	0.00065 SU	0.00058 U	0.00059 U	0.00057 U	0.00059 U
NFDHA	151772-58-6	µg/L	0.00056 U	0.00055 U	0.00049 U	0.00055 U	0.0031 U	0.0005 U	0.00049 U	0.00051 U	0.00056 SU	0.0005 U	0.00051 U	0.00049 U	0.00051 U
NMEFOSA	31506-32-8	µg/L	0.00067 U	0.00066 U	0.00058 U	0.00065 U	0.0037 U	0.0006 U	0.00058 U	0.00061 U	0.00067 SU	0.0006 U	0.00061 U	0.00059 U	0.00061 U
NMEFOSAA	2355-31-9	µg/L	0.00041 U	0.00041 U	0.00036 U	0.00041 U	0.0023 U	0.00037 U	0.00036 U	0.00038 U	0.00041 SU	0.00037 U	0.00038 U	0.00036 U	0.00038 U
NMEFOSE	24448-09-7	µg/L	0.00043 U	0.00043 U	0.00038 U	0.00042 U	0.0024 U	0.00039 U	0.00038 U	0.0004 U	0.00043 SU	0.00039 U	0.0004 U	0.00038 U	0.00039 U
Perfluoro-n-hexadecanoic acid (PFHxDA)	67905-19-5	µg/L	0.00047 U	0.00047 U	0.00041 U	0.00046 U	0.0026 U	0.00042 U	0.00041 U	0.00043 U	0.00047 SU	0.00042 U	0.00043 U	0.00041 U	0.00043 U
Perfluoro-n-octadecanoic acid (PFODA)	16517-11-6	µg/L	0.00054 U	0.00054 U	0.00047 U	0.00053 U	0.003 U	0.00049 U	0.00047 U	0.0005 U	0.00054 SU	0.00048 U	0.0005 U	0.00047 U	0.00049 U
Perfluorobutanesulfonic acid (PFBS)	375-73-5	µg/L	0.005^	0.0021^	0.0022 U	0.00094 U	0.0035^ J	0.0023^	0.00076^ J	0.0017^	0.0028^ S	0.00044 U	0.00028 U	0.00027 U	0.0054^
Perfluorobutanoic acid (PFBA)	375-22-4	µg/L	0.044^ J	0.07^ J	0.024^	0.028^	0.048^	0.031^	0.0011^ J	0.024^	0.088^ S	0.0088^	0.0002 U	0.021^ J	0.09^
Perfluorodecanesulfonic acid (PFDS)	335-77-3	µg/L	0.00049 U	0.00049 U	0.00043 U	0.00049 U	0.0028 U	0.00045 U	0.00043 U	0.00045 U	0.00049 SU	0.00044 U	0.00045 U	0.00043 U	0.00045 U
Perfluorodecanoic acid (PFDA)	335-76-2	µg/L	0.0003 U	0.0003 U	0.00026 U	0.00029 U	0.0017 U	0.00027 U	0.00026 U	0.00043^ J	0.0048^ S	0.00027 U	0.00027 U	0.00026 U	0.00054^ J
Perfluorododecanoic acid (PFDoA)	307-55-1	µg/L	0.00038 U	0.00038 U	0.00033 U	0.00037 U	0.0021 U	0.00034 U	0.00033 U	0.0034^	0.0051^ S	0.00034 U	0.00035 U	0.0016^	0.00034 U
Perfluoroheptanesulfonic acid (PFHpS)	375-92-8	µg/L	0.00064 U	0.00064 U	0.00056 U	0.00063 U	0.0036 U	0.00058 U	0.00056 U	0.00059 U	0.00064 SU	0.00057 U	0.00059 U	0.00056 U	0.00058 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	µg/L	0.0056^	0.0068^	0.07^	0.005^	0.0054^ J	0.0029^	0.00038 U	0.0035^	0.25^ S	0.0026^	0.0004 U	0.18^	0.032^
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	µg/L	0.0014^ J	0.0017^ J	0.002^	0.00058^ J	0.0019 U	0.00094^ J	0.00064^ J	0.0011^ J	0.0024^ S	0.00048 U	0.00031 U	0.00068^ J	0.0019^
Perfluorohexanoic acid (PFHxA)	307-24-4	µg/L	0.0092^	0.0078^	0.058^	0.005^	0.0092^ J	0.0043^	0.00043 U	0.0042^	0.39^ S	0.0031^	0.00045 U	0.19^	0.032^
Perfluorononanesulfonic acid (PFNS)	68259-12-1	µg/L	0.00059 U	0.00059 U	0.00052 U	0.00058 U	0.0033 U	0.00054 U	0.00052 U	0.00055 U	0.00059 SU	0.00053 U	0.00055 U	0.00052 U	0.00054 U
Perfluorononanoic acid (PFNA)	375-95-1	µg/L	0.0005 U	0.00051^ J	0.00044 U	0.00049 U	0.0028 U	0.00045 U	0.00044 U	0.0027^	0.006^ S	0.00045 U	0.00046 U	0.00044 U	0.0089^
Perfluorooctanesulfonamide (FOSA)	754-91-6	µg/L	0.00047 U	0.00047 U	0.00041 U	0.00052^ J	0.0026 U	0.00042 U	0.00041 U	0.00043 U	0.0011^ SJ	0.00042 U	0.00043 U	0.00041 U	0.00043 U
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	µg/L	0.00052 U	0.00052 U	0.00044^	0.0009^ J	0.0029 U	0.0023^	0.0015^ J	0.0038^	0.014^ S	0.00047 U	0.00048 U	0.00046 U	0.0056^
Perfluorooctanoic acid (PFOA)	335-67-1	µg/L	0.067^	0.12^	0.51^	0.05^	0.057^	0.018^	0.00087^ J	0.021^	1.2^ S	0.0054^	0.00046 U	0.19^	0.039^
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	µg/L	0.00066^ J	0.00046 U	0.00058^ J	0.00045 U	0.0026 U	0.00041 U	0.0004 U	0.00049 U	0.00084^ SJ	0.00041 U	0.00042 U	0.00041^ J	0.00042 U
Perfluoropentanoic acid (PFPeA)	2706-90-3	µg/L	0.0073^	0.0062^	0.011^	0.0028 U	0.0036 U	0.0024 U	0.00019 U	0.0037^	0.12^ S	0.005^	0.0002 U	0.026^	0.032^
Perfluorotetradecanoic acid (PFTeA)	376-06-7	µg/L	0.00046 UJ	0.00046 U	0.0004 U	0.00045 U	0.0026 U	0.00041 U	0.0004 U	0.00051^ J	0.0022^ S	0.00041 U	0.00042 U	0.0012^ J	0.00042 U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	µg/L	0.00062 U	0.00062 U	0.00054 U	0.00061 U	0.0035 U	0.00056 U	0.00054 U	0.0035^ S	0.0053^ S	0.00056 U	0.00057 U	0.0028^	0.00056 U
Perfluoroundecanoic acid (PFUnA)	2058-94-8	µg/L	0.00066 U	0.00065 U	0.00058 U	0.00064 U	0.0037 U	0.00059 U	0.00057 U	0.0024^	0.028^ S	0.00059 U	0.0006 U	0.0027^	0.0006 U
PFEEA	113507-82-7	µg/L	0.00026 U	0.00026 U	0.00023 U	0.00026 U	0.0015 U	0.00024 U	0.00023 U	0.00024 U	0.00026 SU	0.00023 U	0.00024 U	0.00023 U	0.00024 U
PFMBA	863090-89-5	µg/L	0.00023 UJ	0.00023 UJ	0.0002 U	0.00023 U	0.0013 U	0.00021 U	0.0002 U	0.00021 U	0.0011^ SJ	0.00021 U	0.00021 U	0.00021^ J	0.00021 U
PFMPA	377-73-1	µg/L	0.00025 U	0.00025 U	0.00022 U	0.00025 U	0.0014 U	0.00023 U	0.00022 U	0.00023 U	0.0006^ SJ	0.00023 U	0.00023 U	0.00022 U	0.00023 U

J = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.

S = The sample results are unvalidated and should be used for screening purposes only.

SU = The sample results are unvalidated and should be used for screening purposes only.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was below the reported sample quantitation limit. However, the reported value is approximate.

^[a] Information identified is location ID, sample ID, sample depth (feet), and sample date.

Bold text with a ^ symbol indicates a detected analyte.

-- = Not analyzed

µg/L = microgram(s) per liter

CAS = Chemical Abstracts Service

ID = identification number

Table 3-2. NASA SSFL PFAS Groundwater Data Results

Site Investigation Report for Per- and Polyfluoroalkyl
Substances in Soil and Groundwater, Santa Susana Field
Laboratory, Ventura County, California

Analyte	CAS	Unit	PZ-045 ^[a]	PZ-048 ^[a]	PZ-140 ^[a]	PZ-140 ^[a]	PZ-154 ^[a]	RD-26 ^[a]	RD-26 ^[a]	RD-49A ^[a]	RD-49B ^[a]	RD-79 ^[a]	RD-81-1 ^[a]	RD-82 ^[a]	RD-82 ^[a]	RD-83 ^[a]	RD-83 ^[a]
			PZ045GWS002 0 to 0 5/27/2022	PZ048GWS004 9 to 19 5/25/2022	PZ140GWS009 52 to 62 6/3/2022	PZ140GWD009 52 to 62 6/3/2022	PZ154GWS004 50 to 60 6/1/2022	RD26GWS005 30 to 160 6/7/2022	RD26GWS006 30 to 160 7/28/2022	RD49AGW01S012 18.5 to 50 6/1/2022	RD49BGW01S012 250 to 298 6/2/2022	RD79GWS011 10 to 55 5/25/2022	RD81GW01S016 114 to 129 5/24/2022	RD82GW01S005 20 to 197 5/25/2022	RD82GW01D005 20 to 197 5/25/2022	RD83GW01S012 20 to 143 7/29/2022	RD83GW01D012 20 to 143 7/29/2022
102FTSA	120226-60-0	µg/L	0.00039 U	0.0004 U	0.00042 U	0.00042 U	0.00042 U	0.00042 U	0.00043 U	0.00039 U	0.00041 U	0.00043 U	0.00041 U	0.0004 U	0.0004 U	0.00043 U	0.00043 U
11CLPF3OUDSA	763051-92-9	µg/L	0.0004 U	0.00041 U	0.00043 U	0.00043 U	0.00043 U	0.00043 U	0.00044 U	0.00039 U	0.00042 U	0.00044 U	0.00042 U	0.00041 U	0.00041 U	0.00044 U	0.00044 U
3:3 FTCA	356-02-5	µg/L	0.00036 U	0.00037 U	0.00039 U	0.00038 U	0.00039 U	0.00038 U	0.00039 U	0.00035 U	0.00037 U	0.00039 U	0.00037 U	0.00037 U	0.00037 U	0.0004 U	0.00039 U
42FTSA	757124-72-4	µg/L	0.0003 U	0.00031 U	0.00032 U	0.00032 U	0.00032 U	0.00032 U	0.00032 U	0.00033 U	0.00031 U	0.00033 U	0.00031 U	0.00031 U	0.00031 U	0.00033 U	0.00033 U
5:3 FTCA	914637-49-3	µg/L	0.00028 U	0.00028 U	0.0003 U	0.00029 U	0.0003 U	0.00029 U	0.0003 U	0.00027 U	0.00029 U	0.0003 U	0.00029 U	0.00028 U	0.00028 U	0.00031 U	0.0003 U
62FTSA	27619-97-2	µg/L	0.00032 U	0.015^	0.00034 U	0.003^ J	0.00078 U	0.00034 U	0.00035 U	0.00031 U	0.001^ J	0.00035 U	0.00033 U	0.00033 U	0.00033 U	0.00035 U	0.00035 U
7:3 FTCA	812-70-4	µg/L	0.00046 U	0.00047 U	0.00049 U	0.00049 U	0.00049 U	0.00049 U	0.0005 U	0.00045 U	0.00048 U	0.0005 U	0.00048 U	0.00047 U	0.00047 U	0.00051 U	0.0005 U
82FTSA	39108-34-4	µg/L	0.00052 U	0.00053 U	0.00056 U	0.003^	0.00056 U	0.00055 U	0.00056 U	0.00051 U	0.00054 U	0.00056 U	0.00054 U	0.00053 U	0.00053 U	0.00057 U	0.00057 U
9CLPF3ONSA	756426-58-1	µg/L	0.00035 U	0.00036 U	0.00038 U	0.00037 U	0.00038 U	0.00037 U	0.00038 U	0.00035 U	0.00036 U	0.00038 U	0.00036 U	0.00036 U	0.00036 U	0.00039 U	0.00038 U
ADONA	919005-14-4	µg/L	0.00043 U	0.00044 U	0.00046 U	0.00045 U	0.00046 U	0.00045 U	0.00046 U	0.00042 U	0.00044 U	0.00046 U	0.00044 U	0.00044 U	0.00044 U	0.00047 U	0.00047 U
HFPODA	13252-13-6	µg/L	0.00058 U	0.00059 U	0.00062 U	0.00061 U	0.00062 U	0.00061 U	0.00063 U	0.00057 U	0.0006 U	0.00063 U	0.0006 U	0.00059 U	0.00059 U	0.00064 U	0.00063 U
NETFOSA	4151-50-2	µg/L	0.00062 U	0.00063 U	0.00066 U	0.00066 U	0.00066 U	0.00066 U	0.00067 U	0.00061 U	0.00064 U	0.00067 U	0.00064 U	0.00064 U	0.00064 U	0.00068 U	0.00068 U
NETFOSAA	2991-50-6	µg/L	0.00028 U	0.00029 U	0.0003 U	0.0003 U	0.0003 U	0.0003 U	0.00031 U	0.00028 U	0.0003 U	0.00031 U	0.0003 U	0.00029 U	0.00029 U	0.00031 U	0.00031 U
NETFOSE	1691-99-2	µg/L	0.0006 U	0.00062 U	0.00065 U	0.00064 U	0.00065 U	0.00064 U	0.00065 U	0.00059 U	0.00063 U	0.00066 U	0.00063 U	0.00062 U	0.00062 U	0.00067 U	0.00066 U
NFDHA	151772-58-6	µg/L	0.00052 U	0.00053 U	0.00056 U	0.00055 U	0.00056 U	0.00055 U	0.00056 U	0.00051 U	0.00054 U	0.00056 U	0.00054 U	0.00053 U	0.00053 U	0.00057 U	0.00057 U
NMEFOSA	31506-32-8	µg/L	0.00062 U	0.00063 U	0.00066 U	0.00066 U	0.00066 U	0.00066 U	0.00067 U	0.00061 U	0.00064 U	0.00067 U	0.00064 U	0.00064 U	0.00064 U	0.00068 U	0.00068 U
NMEFOSAA	2355-31-9	µg/L	0.00038 U	0.00039 U	0.00041 U	0.00041 U	0.00041 U	0.00041 U	0.00042 U	0.00038 U	0.0004 U	0.00042 U	0.0004 U	0.0004 U	0.0004 U	0.00043 U	0.00042 U
NMEFOSE	24448-09-7	µg/L	0.0004 U	0.00041 U	0.00043 U	0.00043 U	0.00043 U	0.00043 U	0.00044 U	0.00039 U	0.00042 U	0.00044 U	0.00042 U	0.00041 U	0.00041 U	0.00044 U	0.00044 U
Perfluoro-n-hexadecanoic acid (PFHxDA)	67905-19-5	µg/L	0.00043 U	0.00044 U	0.00047 U	0.00046 U	0.00047 U	0.00046 U	0.00047 U	0.00043 U	0.00045 U	0.00047 U	0.00045 U	0.00045 U	0.00045 U	0.00048 U	0.00047 U
Perfluoro-n-octadecanoic acid (PFODA)	16517-11-6	µg/L	0.0005 U	0.00051 U	0.00054 U	0.00053 U	0.00054 U	0.00053 U	0.00055 U	0.00049 U	0.00052 U	0.00055 U	0.00052 U	0.00052 U	0.00052 U	0.00055 U	0.00055 U
Perfluorobutanesulfonic acid (PFBS)	375-73-5	µg/L	0.0033^	0.0057^	0.0074^	0.0063^	0.0011^ J	0.0036^	0.0033	0.0019^	0.0021^	0.01^	0.00085 J	0.00029 U	0.00029 U	0.00031 U	0.00031 U
Perfluorobutanoic acid (PFBA)	375-22-4	µg/L	0.022^	0.12^	0.043^	0.043^	0.022^	0.025^	0.024^	0.07^	0.0058^	0.16^	0.0099^	0.00021 U	0.00021 U	0.00025^ J	0.00023^ J
Perfluorodecanesulfonic acid (PFDS)	335-77-3	µg/L	0.00046 U	0.00047 U	0.00049 U	0.00049 U	0.00049 U	0.00049 U	0.0005 U	0.00045 U	0.00048 U	0.0005 U	0.00048 U	0.00047 U	0.00047 U	0.00051 U	0.0005 U
Perfluorodecanoic acid (PFDA)	335-76-2	µg/L	0.00028 U	0.00028 U	0.00073^ J	0.00071^ J	0.0003 U	0.00029 U	0.0003 U	0.00027 U	0.00085^ J	0.0096^	0.00029 U	0.00028 U	0.00028 U	0.00031 U	0.0003 U
Perfluorododecanoic acid (PFDoA)	307-55-1	µg/L	0.00035 U	0.00036 U	0.00038 U	0.00038 U	0.00037 U	0.00038 U	0.00038 U	0.00035 U	0.00036 U	0.00038 U	0.00043^ J	0.00036 U	0.00036 U	0.00039 U	0.00038 U
Perfluoroheptanesulfonic acid (PFHpS)	375-92-8	µg/L	0.00059 U	0.00061 U	0.00064 U	0.00063 U	0.00064 U	0.00063 U	0.00064 U	0.00058 U	0.00062 U	0.00065 U	0.00062 U	0.00061 U	0.00061 U	0.00066 U	0.00065 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	µg/L	0.0051^	0.11^	0.27^	0.3^	0.017^	0.034^	0.032^	0.012^	0.0059^	0.047^	0.0036^	0.00041 U	0.00041 U	0.00044 U	0.00044 U
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	µg/L	0.0017^	0.0033^	0.0027^	0.0031^	0.00047^ J	0.011^	0.01^	0.00095^ J	0.00049^ J	0.0026^	0.00034 U	0.00033 U	0.00033 U	0.00035 U	0.00035 U
Perfluorohexanoic acid (PFHxA)	307-24-4	µg/L	0.0032^	0.082^	0.34^	0.33^	0.024^	0.049^	0.049^	0.018^	0.0099^	0.061^	0.0024^	0.00047 U	0.00047 U	0.00051 U	0.0005 U
Perfluorononanesulfonic acid (PFNS)	68259-12-1	µg/L	0.00055 U	0.00056 U	0.00059 U	0.00059 U	0.00059 U	0.00058 U	0.0006 U	0.00054 U	0.00057 U	0.0006 U	0.00057 U	0.00057 U	0.00057 U	0.00061 U	0.0006 U
Perfluorononanoic acid (PFNA)	375-95-1	µg/L	0.0029^	0.0015^ J	0.0019^	0.002^	0.00075^ J	0.0016^ J	0.00094^ J	0.023^	0.00057^ J	0.017^	0.00091^ J	0.00048 U	0.00048 U	0.00052 U	0.00051 U
Perfluorooctanesulfonamide (FOSA)	754-91-6	µg/L	0.00043 U	0.00044 U	0.00047 U	0.00054^ J	0.00047 U	0.00046 U	0.00047 U	0.00043 U	0.00045 U	0.00047 U	0.00045 U	0.00045 U	0.00045 U	0.00048 U	0.00047 U
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	µg/L	0.01^	0.0051^	0.01^	0.011^	0.0058 U	0.0061^	0.0042^	0.00048 U	0.002^	0.014^	0.0005 U	0.0005 U	0.0005 U	0.00054 U	0.00053 U
Perfluorooctanoic acid (PFOA)	335-67-1	µg/L	0.024^	0.055^	2.9^	3^	0.024^	0.07^	0.014^	0.096^	0.017^	0.071^	0.0068^	0.00048 U	0.00048 U	0.00052 U	0.00051 U
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	µg/L	0.00049^ J	0.00085^ J	0.0014^ J	0.0013^ J	0.00046 U	0.0035^	0.0036^	0.00042 U	0.00049 U	0.00046 U	0.00044 U	0.00044 U	0.00044 U	0.00047 U	0.00047 U
Perfluoropentanoic acid (PFPeA)	2706-90-3	µg/L	0.0016 U	0.097^	0.083^	0.089^	0.0027^	0.075^	0.073^	0.0035^	0.0025^	0.048^	0.0042^	0.00021 U	0.00021 U	0.00022 U	0.00022 U
Perfluorotetradecanoic acid (PFTeA)	376-06-7	µg/L	0.00043 U	0.00044 U	0.00046 U	0.00045 U	0.00046 U	0.00045 U	0.00046 U	0.00042 U	0.00044 U	0.00046 U	0.00049^ J	0.00044 U	0.00044 U	0.00047 U	0.00047 U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	µg/L	0.00058 U	0.00059 U	0.00062 U	0.00061 U	0.00062 U	0.00061 U	0.00063 U	0.00057 U	0.0006 U	0.00063 U	0.0017^	0.00059 U	0.00059 U	0.00064 U	0.00063 U
Perfluoroundecanoic acid (PFUnA)	2058-94-8	µg/L	0.00061 U	0.00062 U	0.00065 U	0.00065 U	0.00066 U	0.00065 U	0.00066 U	0.0011^ J	0.00063 U	0.00081^ J	0.00092^ J	0.00063 U	0.00063 U	0.00068 U	0.00067 U
PFEEA	113507-82-7	µg/L	0.00024 U	0.00025 U	0.00026 U	0.00026 U	0.00026 U	0.00026 U	0.00026 U	0.00024 U	0.00025 U	0.00026 U	0.00025 U	0.00025 U	0.00025 U	0.00027 U	0.00026 U
PFMBA	863090-89-5	µg/L	0.00022 U	0.00022 U	0.00051^ J	0.00053^ J	0.00023 U	0.00023 U	0.00024 U	0.00021 U	0.00023 U	0.00024 U	0.00023 U	0.00022 U	0.00022 U	0.00024 U	0.00024 U
PFMPA	377-73-1	µg/L	0.00023 U	0.00024 U	0.00025 U	0.00025 U	0.00025 U	0.00025 U	0.00025 U	0.00023 U	0.00024 U	0.00025 U	0.00024 U	0.00024 U	0.00024 U	0.00026 U	0.00026 U

J = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.

S = The sample results are unvalidated and should be used for screening purposes only.

SU = The sample results are unvalidated and should be used for screening purposes only.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was below the reported sample quantitation limit. However, the reported value is approximate.

^[a] Information identified is location ID, sample ID, sample depth (feet), and sample date.

Bold text with a ^ symbol indicates a detected analyte.

-- = Not analyzed

µg/L = microgram(s) per liter

CAS = Chemical Abstracts Service

ID = identification number

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	120226-60-0	102FTSA	0.00042	U	µg/L	0.00042	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	763051-92-9	11CLPF3OUDSA	0.00043	U	µg/L	0.00043	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	356-02-5	3:3 FTCA	0.00039	U	µg/L	0.00039	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	757124-72-4	42FTSA	0.00032	U	µg/L	0.00032	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	914637-49-3	5:3 FTCA	0.0003	U	µg/L	0.0003	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	27619-97-2	62FTSA	0.00034	U	µg/L	0.00034	0.0045
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	812-70-4	7:3 FTCA	0.00049	U	µg/L	0.00049	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	39108-34-4	82FTSA	0.00056	U	µg/L	0.00056	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	756426-58-1	9CLPF3ONSA	0.00038	U	µg/L	0.00038	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	919005-14-4	ADONA	0.00046	U	µg/L	0.00046	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	13252-13-6	HFPODA	0.00062	U	µg/L	0.00062	0.0036
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	4151-50-2	NETFOSA	0.00067	U	µg/L	0.00067	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	2991-50-6	NETFOSAA	0.00031	U	µg/L	0.00031	0.0045
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	1691-99-2	NETFOSE	0.00065	UJ	µg/L	0.00065	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	151772-58-6	NFDHA	0.00056	U	µg/L	0.00056	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	31506-32-8	NMEFOSA	0.00067	U	µg/L	0.00067	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	2355-31-9	NMEFOSAA	0.00041	U	µg/L	0.00041	0.0045
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	24448-09-7	NMEFOSE	0.00043	U	µg/L	0.00043	0.0036
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.005		µg/L	0.00031	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.044	J	µg/L	0.00022	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00049	U	µg/L	0.00049	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.0003	U	µg/L	0.0003	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00038	U	µg/L	0.00038	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00064	U	µg/L	0.00064	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0056		µg/L	0.00043	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0014	J	µg/L	0.00034	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.0092		µg/L	0.00049	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00047	U	µg/L	0.00047	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00054	U	µg/L	0.00054	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00059	U	µg/L	0.00059	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.0005	U	µg/L	0.0005	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00047	U	µg/L	0.00047	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.00052	U	µg/L	0.00052	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.067		µg/L	0.0005	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.00066	J	µg/L	0.00046	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0073		µg/L	0.00022	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00046	UJ	µg/L	0.00046	0.0018

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.00062	U	µg/L	0.00062	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.00066	U	µg/L	0.00066	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	113507-82-7	PFEESA	0.00026	U	µg/L	0.00026	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	863090-89-5	PFMBA	0.00023	UJ	µg/L	0.00023	0.0018
HAR-09	6/6/22	WH	N	HAR09GW01S020	E537M	377-73-1	PFMPA	0.00025	U	µg/L	0.00025	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	120226-60-0	102FTSA	0.00042	U	µg/L	0.00042	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	763051-92-9	11CLPF3OUDSA	0.00043	U	µg/L	0.00043	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	356-02-5	3:3 FTCA	0.00038	U	µg/L	0.00038	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	757124-72-4	42FTSA	0.00032	U	µg/L	0.00032	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	914637-49-3	5:3 FTCA	0.0003	U	µg/L	0.0003	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	27619-97-2	62FTSA	0.00034	U	µg/L	0.00034	0.0045
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	812-70-4	7:3 FTCA	0.00049	U	µg/L	0.00049	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	39108-34-4	82FTSA	0.00055	U	µg/L	0.00055	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	756426-58-1	9CLPF3ONSA	0.00038	U	µg/L	0.00038	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	919005-14-4	ADONA	0.00046	U	µg/L	0.00046	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	13252-13-6	HFPODA	0.00062	U	µg/L	0.00062	0.0036
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	4151-50-2	NETFOSA	0.00066	U	µg/L	0.00066	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	2991-50-6	NETFOSAA	0.0003	U	µg/L	0.0003	0.0045
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	1691-99-2	NETFOSE	0.00064	U	µg/L	0.00064	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	151772-58-6	NFDHA	0.00055	U	µg/L	0.00055	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	31506-32-8	NMEFOSA	0.00066	U	µg/L	0.00066	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	2355-31-9	NMEFOSAA	0.00041	U	µg/L	0.00041	0.0045
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	24448-09-7	NMEFOSE	0.00043	U	µg/L	0.00043	0.0036
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0021		µg/L	0.0003	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.07	J	µg/L	0.00021	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00049	U	µg/L	0.00049	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.0003	U	µg/L	0.0003	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00038	U	µg/L	0.00038	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00064	U	µg/L	0.00064	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0068		µg/L	0.00043	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0017	J	µg/L	0.00034	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.0078		µg/L	0.00049	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00047	U	µg/L	0.00047	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00054	U	µg/L	0.00054	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00059	U	µg/L	0.00059	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.00051	J	µg/L	0.0005	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00047	U	µg/L	0.00047	0.0018

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.00052	U	µg/L	0.00052	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.12		µg/L	0.0005	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.00046	U	µg/L	0.00046	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0062		µg/L	0.00021	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00046	U	µg/L	0.00046	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.00062	U	µg/L	0.00062	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.00065	U	µg/L	0.00065	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	113507-82-7	PFEESA	0.00026	U	µg/L	0.00026	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	863090-89-5	PFMBA	0.00023	UJ	µg/L	0.00023	0.0018
HAR-11	6/6/22	WH	N	HAR11GW01S022	E537M	377-73-1	PFMPA	0.00025	U	µg/L	0.00025	0.0018
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	120226-60-0	102FTSA	0.00037	U	µg/L	0.00037	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	763051-92-9	11CLPF3OUDSA	0.00038	U	µg/L	0.00038	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	356-02-5	3:3 FTCA	0.00034	U	µg/L	0.00034	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	757124-72-4	42FTSA	0.00028	U	µg/L	0.00028	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	914637-49-3	5:3 FTCA	0.00026	U	µg/L	0.00026	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	27619-97-2	62FTSA	0.0003	U	µg/L	0.0003	0.0039
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	812-70-4	7:3 FTCA	0.00043	U	µg/L	0.00043	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	39108-34-4	82FTSA	0.00049	U	µg/L	0.00049	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	756426-58-1	9CLPF3ONSA	0.00033	U	µg/L	0.00033	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	919005-14-4	ADONA	0.0004	U	µg/L	0.0004	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	13252-13-6	HFPODA	0.00054	U	µg/L	0.00054	0.0032
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	4151-50-2	NETFOSA	0.00058	U	µg/L	0.00058	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	2991-50-6	NETFOSAA	0.00027	U	µg/L	0.00027	0.0039
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	1691-99-2	NETFOSE	0.00057	U	µg/L	0.00057	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	151772-58-6	NFDHA	0.00049	U	µg/L	0.00049	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	31506-32-8	NMEFOSA	0.00058	U	µg/L	0.00058	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	2355-31-9	NMEFOSAA	0.00036	U	µg/L	0.00036	0.0039
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	24448-09-7	NMEFOSE	0.00038	U	µg/L	0.00038	0.0032
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0022	U	µg/L	0.00027	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.024		µg/L	0.00019	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00043	U	µg/L	0.00043	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.00026	U	µg/L	0.00026	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00033	U	µg/L	0.00033	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00056	U	µg/L	0.00056	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.07		µg/L	0.00038	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.002		µg/L	0.0003	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.058		µg/L	0.00043	0.0016

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00041	U	µg/L	0.00041	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00047	U	µg/L	0.00047	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00052	U	µg/L	0.00052	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.00044	U	µg/L	0.00044	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00041	U	µg/L	0.00041	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0044		µg/L	0.00046	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.51		µg/L	0.0044	0.016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.00058	J	µg/L	0.0004	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.011		µg/L	0.00019	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0004	U	µg/L	0.0004	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.00054	U	µg/L	0.00054	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.00058	U	µg/L	0.00058	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	113507-82-7	PFEESA	0.00023	U	µg/L	0.00023	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	863090-89-5	PFMBA	0.0002	U	µg/L	0.0002	0.0016
HAR-19	5/27/22	WC	N	HAR19GW01S030	E537M	377-73-1	PFMPA	0.00022	U	µg/L	0.00022	0.0016
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	120226-60-0	102FTSA	0.00041	U	µg/L	0.00041	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	763051-92-9	11CLPF3OUDSA	0.00042	U	µg/L	0.00042	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	356-02-5	3:3 FTCA	0.00038	U	µg/L	0.00038	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	757124-72-4	42FTSA	0.00032	U	µg/L	0.00032	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	914637-49-3	5:3 FTCA	0.00029	U	µg/L	0.00029	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	27619-97-2	62FTSA	0.00034	U	µg/L	0.00034	0.0044
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	812-70-4	7:3 FTCA	0.00049	U	µg/L	0.00049	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	39108-34-4	82FTSA	0.00055	U	µg/L	0.00055	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	756426-58-1	9CLPF3ONSA	0.00037	U	µg/L	0.00037	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	919005-14-4	ADONA	0.00045	U	µg/L	0.00045	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	13252-13-6	HFPODA	0.00061	U	µg/L	0.00061	0.0035
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	4151-50-2	NETFOSA	0.00065	U	µg/L	0.00065	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	2991-50-6	NETFOSAA	0.0003	U	µg/L	0.0003	0.0044
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	1691-99-2	NETFOSE	0.00064	U	µg/L	0.00064	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	151772-58-6	NFDHA	0.00055	U	µg/L	0.00055	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	31506-32-8	NMEFOSA	0.00065	U	µg/L	0.00065	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	2355-31-9	NMEFOSAA	0.00041	U	µg/L	0.00041	0.0044
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	24448-09-7	NMEFOSE	0.00042	U	µg/L	0.00042	0.0035
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.00094	U	µg/L	0.0003	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.028		µg/L	0.00021	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00049	U	µg/L	0.00049	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.00029	U	µg/L	0.00029	0.0018

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00037	U	µg/L	0.00037	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00063	U	µg/L	0.00063	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.005		µg/L	0.00042	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00058	J	µg/L	0.00034	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.005		µg/L	0.00049	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00046	U	µg/L	0.00046	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00053	U	µg/L	0.00053	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00058	U	µg/L	0.00058	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.00049	U	µg/L	0.00049	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00052	J	µg/L	0.00046	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0009	J	µg/L	0.00051	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.05		µg/L	0.00049	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.00045	U	µg/L	0.00045	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0028	U	µg/L	0.00021	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00045	U	µg/L	0.00045	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.00061	U	µg/L	0.00061	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.00064	U	µg/L	0.00064	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	113507-82-7	PFEESA	0.00026	U	µg/L	0.00026	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	863090-89-5	PFMBA	0.00023	U	µg/L	0.00023	0.0018
HAR-20	6/2/22	WC	N	HAR20GW01S023	E537M	377-73-1	PFMPA	0.00025	U	µg/L	0.00025	0.0018
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	120226-60-0	102FTSA	0.0024	U	µg/L	0.0024	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	763051-92-9	11CLPF3OUDSA	0.0024	U	µg/L	0.0024	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	356-02-5	3:3 FTCA	0.0022	U	µg/L	0.0022	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	757124-72-4	42FTSA	0.0018	U	µg/L	0.0018	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	914637-49-3	5:3 FTCA	0.0017	U	µg/L	0.0017	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	27619-97-2	62FTSA	0.0019	U	µg/L	0.0019	0.025
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	812-70-4	7:3 FTCA	0.0028	U	µg/L	0.0028	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	39108-34-4	82FTSA	0.0031	U	µg/L	0.0031	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	756426-58-1	9CLPF3ONSA	0.0021	U	µg/L	0.0021	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	919005-14-4	ADONA	0.0026	U	µg/L	0.0026	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	13252-13-6	HFPODA	0.0035	U	µg/L	0.0035	0.02
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	4151-50-2	NETFOSA	0.0037	U	µg/L	0.0037	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	2991-50-6	NETFOSAA	0.0017	U	µg/L	0.0017	0.025
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	1691-99-2	NETFOSE	0.0036	U	µg/L	0.0036	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	151772-58-6	NFDHA	0.0031	U	µg/L	0.0031	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	31506-32-8	NMEFOSA	0.0037	U	µg/L	0.0037	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	2355-31-9	NMEFOSAA	0.0023	U	µg/L	0.0023	0.025

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	24448-09-7	NMEFOSE	0.0024	U	µg/L	0.0024	0.02
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0035	J	µg/L	0.0017	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.048		µg/L	0.0012	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0028	U	µg/L	0.0028	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.0017	U	µg/L	0.0017	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.0021	U	µg/L	0.0021	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.0036	U	µg/L	0.0036	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0054	J	µg/L	0.0024	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0019	U	µg/L	0.0019	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.0092	J	µg/L	0.0028	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.0026	U	µg/L	0.0026	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.003	U	µg/L	0.003	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.0033	U	µg/L	0.0033	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.0028	U	µg/L	0.0028	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.0026	U	µg/L	0.0026	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0029	U	µg/L	0.0029	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.057		µg/L	0.0028	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.0026	U	µg/L	0.0026	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0036	U	µg/L	0.0012	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0026	U	µg/L	0.0026	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.0035	U	µg/L	0.0035	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0037	U	µg/L	0.0037	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	113507-82-7	PFEESA	0.0015	U	µg/L	0.0015	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	863090-89-5	PFMBA	0.0013	U	µg/L	0.0013	0.01
HAR-21	6/6/22	WC	N	HAR21GW01S019	E537M	377-73-1	PFMPA	0.0014	U	µg/L	0.0014	0.01
HAR-27	6/1/22	WH	N	HAR27GWS014	E537M	120226-60-0	102FTSA	0.00038	U	µg/L	0.00038	0.0016
HAR-27	6/1/22	WH	N	HAR27GWS014	E537M	763051-92-9	11CLPF3OUDSA	0.00039	U	µg/L	0.00039	0.0016
HAR-27	6/1/22	WH	N	HAR27GWS014	E537M	356-02-5	3:3 FTCA	0.00035	U	µg/L	0.00035	0.0016
HAR-27	6/1/22	WH	N	HAR27GWS014	E537M	757124-72-4	42FTSA	0.00029	U	µg/L	0.00029	0.0016
HAR-27	6/1/22	WH	N	HAR27GWS014	E537M	914637-49-3	5:3 FTCA	0.00027	U	µg/L	0.00027	0.0016
HAR-27	6/1/22	WH	N	HAR27GWS014	E537M	27619-97-2	62FTSA	0.00031	U	µg/L	0.00031	0.0041
HAR-27	6/1/22	WH	N	HAR27GWS014	E537M	812-70-4	7:3 FTCA	0.00045	U	µg/L	0.00045	0.0016
HAR-27	6/1/22	WH	N	HAR27GWS014	E537M	39108-34-4	82FTSA	0.0005	U	µg/L	0.0005	0.0016
HAR-27	6/1/22	WH	N	HAR27GWS014	E537M	756426-58-1	9CLPF3ONSA	0.00034	U	µg/L	0.00034	0.0016
HAR-27	6/1/22	WH	N	HAR27GWS014	E537M	919005-14-4	ADONA	0.00041	U	µg/L	0.00041	0.0016
HAR-27	6/1/22	WH	N	HAR27GWS014	E537M	13252-13-6	HFPODA	0.00056	U	µg/L	0.00056	0.0032
HAR-27	6/1/22	WH	N	HAR27GWS014	E537M	4151-50-2	NETFOSA	0.0006	U	µg/L	0.0006	0.0016

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	2991-50-6	NETFOSAA	0.00028	U	µg/L	0.00028	0.0041
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	1691-99-2	NETFOSE	0.00058	U	µg/L	0.00058	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	151772-58-6	NFDHA	0.0005	U	µg/L	0.0005	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	31506-32-8	NMEFOSA	0.0006	U	µg/L	0.0006	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	2355-31-9	NMEFOSAA	0.00037	U	µg/L	0.00037	0.0041
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	24448-09-7	NMEFOSE	0.00039	U	µg/L	0.00039	0.0032
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0023		µg/L	0.00028	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.031		µg/L	0.00019	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00045	U	µg/L	0.00045	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.00027	U	µg/L	0.00027	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00034	U	µg/L	0.00034	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00058	U	µg/L	0.00058	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0029		µg/L	0.00039	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00094	J	µg/L	0.00031	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.0043		µg/L	0.00045	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00042	U	µg/L	0.00042	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00049	U	µg/L	0.00049	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00054	U	µg/L	0.00054	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.00045	U	µg/L	0.00045	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00042	U	µg/L	0.00042	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0023		µg/L	0.00047	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.018		µg/L	0.00045	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.00041	U	µg/L	0.00041	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0024	U	µg/L	0.00019	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00041	U	µg/L	0.00041	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.00056	U	µg/L	0.00056	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.00059	U	µg/L	0.00059	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	113507-82-7	PFEESA	0.00024	U	µg/L	0.00024	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	863090-89-5	PFMBA	0.00021	U	µg/L	0.00021	0.0016
HAR-27	6/1/22	WH	N	HAR27GWSO14	E537M	377-73-1	PFMPA	0.00023	U	µg/L	0.00023	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	120226-60-0	102FTSA	0.00037	U	µg/L	0.00037	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	763051-92-9	11CLPF3OUDSA	0.00038	U	µg/L	0.00038	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	356-02-5	3:3 FTCA	0.00034	U	µg/L	0.00034	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	757124-72-4	42FTSA	0.00028	U	µg/L	0.00028	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	914637-49-3	5:3 FTCA	0.00026	U	µg/L	0.00026	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	27619-97-2	62FTSA	0.0003	U	µg/L	0.0003	0.0039
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	812-70-4	7:3 FTCA	0.00043	U	µg/L	0.00043	0.0016

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	39108-34-4	82FTSA	0.00049	U	µg/L	0.00049	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	756426-58-1	9CLPF3ONSA	0.00033	U	µg/L	0.00033	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	919005-14-4	ADONA	0.0004	U	µg/L	0.0004	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	13252-13-6	HFPODA	0.00054	U	µg/L	0.00054	0.0031
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	4151-50-2	NETFOSA	0.00058	U	µg/L	0.00058	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	2991-50-6	NETFOSAA	0.00027	U	µg/L	0.00027	0.0039
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	1691-99-2	NETFOSE	0.00056	U	µg/L	0.00056	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	151772-58-6	NFDHA	0.00049	U	µg/L	0.00049	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	31506-32-8	NMEFOSA	0.00058	U	µg/L	0.00058	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	2355-31-9	NMEFOSAA	0.00036	U	µg/L	0.00036	0.0039
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	24448-09-7	NMEFOSE	0.00038	U	µg/L	0.00038	0.0031
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.00076	J	µg/L	0.00027	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.0011	J	µg/L	0.00019	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00043	U	µg/L	0.00043	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.00026	U	µg/L	0.00026	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00033	U	µg/L	0.00033	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00056	U	µg/L	0.00056	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.00038	U	µg/L	0.00038	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00064	J	µg/L	0.0003	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.00043	U	µg/L	0.00043	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00041	U	µg/L	0.00041	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00047	U	µg/L	0.00047	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00052	U	µg/L	0.00052	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.00044	U	µg/L	0.00044	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00041	U	µg/L	0.00041	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0015	J	µg/L	0.00045	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.00087	J	µg/L	0.00044	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.0004	U	µg/L	0.0004	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.00019	U	µg/L	0.00019	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0004	U	µg/L	0.0004	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.00054	U	µg/L	0.00054	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.00057	U	µg/L	0.00057	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	113507-82-7	PFEESA	0.00023	U	µg/L	0.00023	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	863090-89-5	PFMBA	0.0002	U	µg/L	0.0002	0.0016
HAR-28	5/31/22	WH	N	HAR28GW01S021	E537M	377-73-1	PFMPA	0.00022	U	µg/L	0.00022	0.0016
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	120226-60-0	102FTSA	0.00039	U	µg/L	0.00039	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	763051-92-9	11CLPF3OUDSA	0.0004	U	µg/L	0.0004	0.0017

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	356-02-5	3:3 FTCA	0.00036	U	µg/L	0.00036	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	757124-72-4	42FTSA	0.0003	U	µg/L	0.0003	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	914637-49-3	5:3 FTCA	0.00027	U	µg/L	0.00027	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	27619-97-2	62FTSA	0.0028	J	µg/L	0.00031	0.0041
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	812-70-4	7:3 FTCA	0.00045	U	µg/L	0.00045	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	39108-34-4	82FTSA	0.00051	U	µg/L	0.00051	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	756426-58-1	9CLPF3ONSA	0.00035	U	µg/L	0.00035	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	919005-14-4	ADONA	0.00042	U	µg/L	0.00042	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	13252-13-6	HFPODA	0.00057	U	µg/L	0.00057	0.0033
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	4151-50-2	NETFOSA	0.00061	U	µg/L	0.00061	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	2991-50-6	NETFOSAA	0.00028	U	µg/L	0.00028	0.0041
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	1691-99-2	NETFOSE	0.0006	U	µg/L	0.0006	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	151772-58-6	NFDHA	0.00051	U	µg/L	0.00051	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	31506-32-8	NMEFOSA	0.00061	U	µg/L	0.00061	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	2355-31-9	NMEFOSAA	0.00038	U	µg/L	0.00038	0.0041
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	24448-09-7	NMEFOSE	0.0004	U	µg/L	0.0004	0.0033
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0017		µg/L	0.00028	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.024		µg/L	0.0002	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00045	U	µg/L	0.00045	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.00043	J	µg/L	0.00027	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.0034		µg/L	0.00035	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00059	U	µg/L	0.00059	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0035		µg/L	0.0004	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0011	J	µg/L	0.00031	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.0042		µg/L	0.00045	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00043	U	µg/L	0.00043	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.0005	U	µg/L	0.0005	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00055	U	µg/L	0.00055	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.0027		µg/L	0.00046	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00043	U	µg/L	0.00043	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0038		µg/L	0.00048	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.021		µg/L	0.00046	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.00049	U	µg/L	0.00042	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0037		µg/L	0.0002	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00051	J	µg/L	0.00042	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.0035		µg/L	0.00057	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0024		µg/L	0.0006	0.0017

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	113507-82-7	PFEESA	0.00024	U	µg/L	0.00024	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	863090-89-5	PFMBA	0.00021	U	µg/L	0.00021	0.0017
ND-113-1	5/26/22	WC	N	ND113GW01S014	E537M	377-73-1	PFMPA	0.00023	U	µg/L	0.00023	0.0017
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	120226-60-0	102FTSA	0.00042	SU	µg/L	0.00042	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	763051-92-9	11CLPF3OUDSA	0.00043	SU	µg/L	0.00043	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	356-02-5	3:3 FTCA	0.00039	SU	µg/L	0.00039	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	757124-72-4	42FTSA	0.00032	SU	µg/L	0.00032	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	914637-49-3	5:3 FTCA	0.011	S	µg/L	0.0003	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	27619-97-2	62FTSA	0.0023	SJ	µg/L	0.00034	0.0045
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	812-70-4	7:3 FTCA	0.00049	SU	µg/L	0.00049	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	39108-34-4	82FTSA	0.00056	SU	µg/L	0.00056	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	756426-58-1	9CLPF3ONSA	0.00038	SU	µg/L	0.00038	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	919005-14-4	ADONA	0.00046	SU	µg/L	0.00046	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	13252-13-6	HFPODA	0.00062	SU	µg/L	0.00062	0.0036
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	4151-50-2	NETFOSA	0.00067	SU	µg/L	0.00067	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	2991-50-6	NETFOSAA	0.00031	SU	µg/L	0.00031	0.0045
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	1691-99-2	NETFOSE	0.00065	SU	µg/L	0.00065	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	151772-58-6	NFDHA	0.00056	SU	µg/L	0.00056	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	31506-32-8	NMEFOSA	0.00067	SU	µg/L	0.00067	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	2355-31-9	NMEFOSAA	0.00041	SU	µg/L	0.00041	0.0045
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	24448-09-7	NMEFOSE	0.00043	SU	µg/L	0.00043	0.0036
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0028	S	µg/L	0.00031	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.088	S	µg/L	0.00022	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00049	SU	µg/L	0.00049	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.0048	S	µg/L	0.0003	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.0051	S	µg/L	0.00038	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00064	SU	µg/L	0.00064	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.25	S	µg/L	0.00043	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0024	S	µg/L	0.00034	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.39	S	µg/L	0.0025	0.009
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00047	SU	µg/L	0.00047	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00054	SU	µg/L	0.00054	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00059	SU	µg/L	0.00059	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.006	S	µg/L	0.0005	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.0011	SJ	µg/L	0.00047	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.014	S	µg/L	0.00052	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	1.2	S	µg/L	0.0025	0.009

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.00084	SJ	µg/L	0.00046	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.12	S	µg/L	0.00022	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0022	S	µg/L	0.00046	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.0053	S	µg/L	0.00062	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.028	S	µg/L	0.00066	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	113507-82-7	PFEESA	0.00026	SU	µg/L	0.00026	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	863090-89-5	PFMBA	0.0011	SJ	µg/L	0.00023	0.0018
ND-125-1	6/3/22	WC	N	ND125GW01S014	E537M	377-73-1	PFMPA	0.0006	SJ	µg/L	0.00025	0.0018
ND-126	5/23/22	WC	N	ND126GWS013	E537M	120226-60-0	102FTSA	0.00038	U	µg/L	0.00038	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	763051-92-9	11CLPF3OUDSA	0.00039	U	µg/L	0.00039	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	356-02-5	3:3 FTCA	0.00035	U	µg/L	0.00035	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	757124-72-4	42FTSA	0.00029	U	µg/L	0.00029	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	914637-49-3	5:3 FTCA	0.00027	U	µg/L	0.00027	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	27619-97-2	62FTSA	0.00031	U	µg/L	0.00031	0.004
ND-126	5/23/22	WC	N	ND126GWS013	E537M	812-70-4	7:3 FTCA	0.00044	U	µg/L	0.00044	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	39108-34-4	82FTSA	0.0005	U	µg/L	0.0005	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	756426-58-1	9CLPF3ONSA	0.00034	U	µg/L	0.00034	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	919005-14-4	ADONA	0.00041	U	µg/L	0.00041	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	13252-13-6	HFPODA	0.00056	U	µg/L	0.00056	0.0032
ND-126	5/23/22	WC	N	ND126GWS013	E537M	4151-50-2	NETFOSA	0.0006	U	µg/L	0.0006	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	2991-50-6	NETFOSAA	0.00027	U	µg/L	0.00027	0.004
ND-126	5/23/22	WC	N	ND126GWS013	E537M	1691-99-2	NETFOSE	0.00058	U	µg/L	0.00058	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	151772-58-6	NFDHA	0.0005	U	µg/L	0.0005	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	31506-32-8	NMEFOSA	0.0006	U	µg/L	0.0006	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	2355-31-9	NMEFOSAA	0.00037	U	µg/L	0.00037	0.004
ND-126	5/23/22	WC	N	ND126GWS013	E537M	24448-09-7	NMEFOSE	0.00039	U	µg/L	0.00039	0.0032
ND-126	5/23/22	WC	N	ND126GWS013	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.00044	U	µg/L	0.00027	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.0088		µg/L	0.00019	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00044	U	µg/L	0.00044	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.00027	U	µg/L	0.00027	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00034	U	µg/L	0.00034	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00057	U	µg/L	0.00057	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0026		µg/L	0.00039	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00048	U	µg/L	0.00031	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.0031		µg/L	0.00044	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00042	U	µg/L	0.00042	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00048	U	µg/L	0.00048	0.0016

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
ND-126	5/23/22	WC	N	ND126GWS013	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00053	U	µg/L	0.00053	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.00045	U	µg/L	0.00045	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00042	U	µg/L	0.00042	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.00047	U	µg/L	0.00047	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.0054		µg/L	0.00045	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.00041	U	µg/L	0.00041	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.005		µg/L	0.00019	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00041	U	µg/L	0.00041	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.00056	U	µg/L	0.00056	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.00059	U	µg/L	0.00059	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	113507-82-7	PFEESA	0.00023	U	µg/L	0.00023	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	863090-89-5	PFMBA	0.00021	U	µg/L	0.00021	0.0016
ND-126	5/23/22	WC	N	ND126GWS013	E537M	377-73-1	PFMPA	0.00023	U	µg/L	0.00023	0.0016
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	120226-60-0	102FTSA	0.00039	U	µg/L	0.00039	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	763051-92-9	11CLPF3OUDSA	0.0004	U	µg/L	0.0004	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	356-02-5	3:3 FTCA	0.00036	U	µg/L	0.00036	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	757124-72-4	42FTSA	0.0003	U	µg/L	0.0003	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	914637-49-3	5:3 FTCA	0.00027	U	µg/L	0.00027	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	27619-97-2	62FTSA	0.00031	U	µg/L	0.00031	0.0041
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	812-70-4	7:3 FTCA	0.00045	U	µg/L	0.00045	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	39108-34-4	82FTSA	0.00051	U	µg/L	0.00051	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	756426-58-1	9CLPF3ONSA	0.00035	U	µg/L	0.00035	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	919005-14-4	ADONA	0.00042	U	µg/L	0.00042	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	13252-13-6	HFPODA	0.00057	U	µg/L	0.00057	0.0033
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	4151-50-2	NETFOSA	0.00061	U	µg/L	0.00061	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	2991-50-6	NETFOSAA	0.00028	U	µg/L	0.00028	0.0041
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	1691-99-2	NETFOSE	0.00059	U	µg/L	0.00059	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	151772-58-6	NFDHA	0.00051	U	µg/L	0.00051	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	31506-32-8	NMEFOSA	0.00061	U	µg/L	0.00061	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	2355-31-9	NMEFOSAA	0.00038	U	µg/L	0.00038	0.0041
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	24448-09-7	NMEFOSE	0.0004	U	µg/L	0.0004	0.0033
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.00028	U	µg/L	0.00028	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.0002	U	µg/L	0.0002	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00045	U	µg/L	0.00045	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.00027	U	µg/L	0.00027	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00035	U	µg/L	0.00035	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00059	U	µg/L	0.00059	0.0017

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0004	U	µg/L	0.0004	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00031	U	µg/L	0.00031	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.00045	U	µg/L	0.00045	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00043	U	µg/L	0.00043	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.0005	U	µg/L	0.0005	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00055	U	µg/L	0.00055	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.00046	U	µg/L	0.00046	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00043	U	µg/L	0.00043	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.00048	U	µg/L	0.00048	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.00046	U	µg/L	0.00046	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.00042	U	µg/L	0.00042	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0002	U	µg/L	0.0002	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00042	U	µg/L	0.00042	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.00057	U	µg/L	0.00057	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0006	U	µg/L	0.0006	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	113507-82-7	PFEESA	0.00024	U	µg/L	0.00024	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	863090-89-5	PFMBA	0.00021	U	µg/L	0.00021	0.0017
ND-134-1	5/27/22	WC	N	ND134GW01S014	E537M	377-73-1	PFMPA	0.00023	U	µg/L	0.00023	0.0017
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	120226-60-0	102FTSA	0.00037	U	µg/L	0.00037	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	763051-92-9	11CLPF3OUDSA	0.00038	U	µg/L	0.00038	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	356-02-5	3:3 FTCA	0.00034	U	µg/L	0.00034	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	757124-72-4	42FTSA	0.00028	U	µg/L	0.00028	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	914637-49-3	5:3 FTCA	0.00026	U	µg/L	0.00026	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	27619-97-2	62FTSA	0.0003	U	µg/L	0.0003	0.004
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	812-70-4	7:3 FTCA	0.00043	U	µg/L	0.00043	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	39108-34-4	82FTSA	0.00049	U	µg/L	0.00049	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	756426-58-1	9CLPF3ONSA	0.00033	U	µg/L	0.00033	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	919005-14-4	ADONA	0.0004	U	µg/L	0.0004	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	13252-13-6	HFPODA	0.00055	U	µg/L	0.00055	0.0032
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	4151-50-2	NETFOSA	0.00059	U	µg/L	0.00059	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	2991-50-6	NETFOSAA	0.00027	U	µg/L	0.00027	0.004
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	1691-99-2	NETFOSE	0.00057	U	µg/L	0.00057	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	151772-58-6	NFDHA	0.00049	U	µg/L	0.00049	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	31506-32-8	NMEFOSA	0.00059	U	µg/L	0.00059	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	2355-31-9	NMEFOSAA	0.00036	U	µg/L	0.00036	0.004
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	24448-09-7	NMEFOSE	0.00038	U	µg/L	0.00038	0.0032
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.00027	U	µg/L	0.00027	0.0016

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.021	J	µg/L	0.00019	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00043	U	µg/L	0.00043	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.00026	U	µg/L	0.00026	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.0016		µg/L	0.00033	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00056	U	µg/L	0.00056	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.18		µg/L	0.00038	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00068	J	µg/L	0.0003	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.19		µg/L	0.00043	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00041	U	µg/L	0.00041	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00047	U	µg/L	0.00047	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00052	U	µg/L	0.00052	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.00044	U	µg/L	0.00044	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00041	U	µg/L	0.00041	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.00046	U	µg/L	0.00046	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.19		µg/L	0.00044	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.00041	J	µg/L	0.0004	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.026		µg/L	0.00019	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0012	J	µg/L	0.0004	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.0028		µg/L	0.00055	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0027		µg/L	0.00058	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	113507-82-7	PFEESA	0.00023	U	µg/L	0.00023	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	863090-89-5	PFMBA	0.00021	J	µg/L	0.00021	0.0016
ND-135-1	5/31/22	WC	N	ND135GW01S024	E537M	377-73-1	PFMPA	0.00022	U	µg/L	0.00022	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	120226-60-0	102FTSA	0.00038	U	µg/L	0.00038	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	763051-92-9	11CLPF3OUDSA	0.00039	U	µg/L	0.00039	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	356-02-5	3:3 FTCA	0.00035	U	µg/L	0.00035	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	757124-72-4	42FTSA	0.00029	U	µg/L	0.00029	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	914637-49-3	5:3 FTCA	0.00027	U	µg/L	0.00027	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	27619-97-2	62FTSA	0.00075	J	µg/L	0.00031	0.0041
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	812-70-4	7:3 FTCA	0.00045	U	µg/L	0.00045	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	39108-34-4	82FTSA	0.00051	U	µg/L	0.00051	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	756426-58-1	9CLPF3ONSA	0.00034	U	µg/L	0.00034	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	919005-14-4	ADONA	0.00042	U	µg/L	0.00042	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	13252-13-6	HFPODA	0.00056	U	µg/L	0.00056	0.0033
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	4151-50-2	NETFOSA	0.00061	U	µg/L	0.00061	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	2991-50-6	NETFOSAA	0.00028	U	µg/L	0.00028	0.0041
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	1691-99-2	NETFOSE	0.00059	U	µg/L	0.00059	0.0016

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	151772-58-6	NFDHA	0.00051	U	µg/L	0.00051	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	31506-32-8	NMEFOSA	0.00061	U	µg/L	0.00061	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	2355-31-9	NMEFOSAA	0.00038	U	µg/L	0.00038	0.0041
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	24448-09-7	NMEFOSE	0.00039	U	µg/L	0.00039	0.0033
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0054		µg/L	0.00028	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.09		µg/L	0.0002	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00045	U	µg/L	0.00045	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.00054	J	µg/L	0.00027	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00034	U	µg/L	0.00034	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00058	U	µg/L	0.00058	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.032		µg/L	0.00039	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0019		µg/L	0.00031	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.032		µg/L	0.00045	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00043	U	µg/L	0.00043	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00049	U	µg/L	0.00049	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00054	U	µg/L	0.00054	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.0089		µg/L	0.00046	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00043	U	µg/L	0.00043	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0056		µg/L	0.00047	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.039		µg/L	0.00046	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.00042	U	µg/L	0.00042	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.032		µg/L	0.0002	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00042	U	µg/L	0.00042	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.00056	U	µg/L	0.00056	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0006	U	µg/L	0.0006	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	113507-82-7	PFEESA	0.00024	U	µg/L	0.00024	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	863090-89-5	PFMBA	0.00021	U	µg/L	0.00021	0.0016
PZ-017A	5/26/22	WH	N	PZO17AGWS003	E537M	377-73-1	PFMPA	0.00023	U	µg/L	0.00023	0.0016
PZ-045	5/27/22	WH	N	PZO45GWS002	E537M	120226-60-0	102FTSA	0.00039	U	µg/L	0.00039	0.0017
PZ-045	5/27/22	WH	N	PZO45GWS002	E537M	763051-92-9	11CLPF3OUDSA	0.0004	U	µg/L	0.0004	0.0017
PZ-045	5/27/22	WH	N	PZO45GWS002	E537M	356-02-5	3:3 FTCA	0.00036	U	µg/L	0.00036	0.0017
PZ-045	5/27/22	WH	N	PZO45GWS002	E537M	757124-72-4	42FTSA	0.0003	U	µg/L	0.0003	0.0017
PZ-045	5/27/22	WH	N	PZO45GWS002	E537M	914637-49-3	5:3 FTCA	0.00028	U	µg/L	0.00028	0.0017
PZ-045	5/27/22	WH	N	PZO45GWS002	E537M	27619-97-2	62FTSA	0.00032	U	µg/L	0.00032	0.0042
PZ-045	5/27/22	WH	N	PZO45GWS002	E537M	812-70-4	7:3 FTCA	0.00046	U	µg/L	0.00046	0.0017
PZ-045	5/27/22	WH	N	PZO45GWS002	E537M	39108-34-4	82FTSA	0.00052	U	µg/L	0.00052	0.0017
PZ-045	5/27/22	WH	N	PZO45GWS002	E537M	756426-58-1	9CLPF3ONSA	0.00035	U	µg/L	0.00035	0.0017

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	919005-14-4	ADONA	0.00043	U	µg/L	0.00043	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	13252-13-6	HFPODA	0.00058	U	µg/L	0.00058	0.0033
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	4151-50-2	NETFOSA	0.00062	U	µg/L	0.00062	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	2991-50-6	NETFOSAA	0.00028	U	µg/L	0.00028	0.0042
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	1691-99-2	NETFOSE	0.0006	U	µg/L	0.0006	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	151772-58-6	NFDHA	0.00052	U	µg/L	0.00052	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	31506-32-8	NMEFOSA	0.00062	U	µg/L	0.00062	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	2355-31-9	NMEFOSAA	0.00038	U	µg/L	0.00038	0.0042
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	24448-09-7	NMEFOSE	0.0004	U	µg/L	0.0004	0.0033
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0033		µg/L	0.00028	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.022		µg/L	0.0002	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00046	U	µg/L	0.00046	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.00028	U	µg/L	0.00028	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00035	U	µg/L	0.00035	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00059	U	µg/L	0.00059	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0051		µg/L	0.0004	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0017		µg/L	0.00032	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.0032		µg/L	0.00046	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00043	U	µg/L	0.00043	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.0005	U	µg/L	0.0005	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00055	U	µg/L	0.00055	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.0029		µg/L	0.00047	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00043	U	µg/L	0.00043	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.01		µg/L	0.00048	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.024		µg/L	0.00047	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.00049	J	µg/L	0.00043	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0016	U	µg/L	0.0002	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00043	U	µg/L	0.00043	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.00058	U	µg/L	0.00058	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.00061	U	µg/L	0.00061	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	113507-82-7	PFEESA	0.00024	U	µg/L	0.00024	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	863090-89-5	PFMBA	0.00022	U	µg/L	0.00022	0.0017
PZ-045	5/27/22	WH	N	PZ045GWS002	E537M	377-73-1	PFMPA	0.00023	U	µg/L	0.00023	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	120226-60-0	102FTSA	0.0004	U	µg/L	0.0004	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	763051-92-9	11CLPF3OUDSA	0.00041	U	µg/L	0.00041	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	356-02-5	3:3 FTCA	0.00037	U	µg/L	0.00037	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	757124-72-4	42FTSA	0.00031	U	µg/L	0.00031	0.0017

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	914637-49-3	5:3 FTCA	0.00028	U	µg/L	0.00028	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	27619-97-2	62FTSA	0.015		µg/L	0.00032	0.0043
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	812-70-4	7:3 FTCA	0.00047	U	µg/L	0.00047	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	39108-34-4	82FTSA	0.00053	U	µg/L	0.00053	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	756426-58-1	9CLPF3ONSA	0.00036	U	µg/L	0.00036	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	919005-14-4	ADONA	0.00044	U	µg/L	0.00044	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	13252-13-6	HFPODA	0.00059	U	µg/L	0.00059	0.0034
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	4151-50-2	NETFOSA	0.00063	U	µg/L	0.00063	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	2991-50-6	NETFOSAA	0.00029	U	µg/L	0.00029	0.0043
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	1691-99-2	NETFOSE	0.00062	U	µg/L	0.00062	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	151772-58-6	NFDHA	0.00053	U	µg/L	0.00053	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	31506-32-8	NMEFOSA	0.00063	U	µg/L	0.00063	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	2355-31-9	NMEFOSAA	0.00039	U	µg/L	0.00039	0.0043
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	24448-09-7	NMEFOSE	0.00041	U	µg/L	0.00041	0.0034
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0057		µg/L	0.00029	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.12		µg/L	0.00021	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00047	U	µg/L	0.00047	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.00028	U	µg/L	0.00028	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00036	U	µg/L	0.00036	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00061	U	µg/L	0.00061	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.11		µg/L	0.00041	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0033		µg/L	0.00032	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.082		µg/L	0.00047	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00044	U	µg/L	0.00044	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00051	U	µg/L	0.00051	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00056	U	µg/L	0.00056	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.0015	J	µg/L	0.00048	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00044	U	µg/L	0.00044	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0051		µg/L	0.0005	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.055		µg/L	0.00048	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.00085	J	µg/L	0.00044	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.097		µg/L	0.00021	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00044	U	µg/L	0.00044	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.00059	U	µg/L	0.00059	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.00062	U	µg/L	0.00062	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	113507-82-7	PFEESA	0.00025	U	µg/L	0.00025	0.0017
PZ-048	5/25/22	WH	N	PZ048GWS004	E537M	863090-89-5	PFMBA	0.00022	U	µg/L	0.00022	0.0017

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
PZ-048	5/25/22	WH	N	PZO48GWS004	E537M	377-73-1	PFMPA	0.00024	U	µg/L	0.00024	0.0017
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	120226-60-0	102FTSA	0.00042	U	µg/L	0.00042	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	120226-60-0	102FTSA	0.00042	U	µg/L	0.00042	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	763051-92-9	11CLPF3OUDSA	0.00043	U	µg/L	0.00043	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	763051-92-9	11CLPF3OUDSA	0.00043	U	µg/L	0.00043	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	356-02-5	3:3 FTCA	0.00039	U	µg/L	0.00039	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	356-02-5	3:3 FTCA	0.00038	U	µg/L	0.00038	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	757124-72-4	42FTSA	0.00032	U	µg/L	0.00032	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	757124-72-4	42FTSA	0.00032	U	µg/L	0.00032	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	914637-49-3	5:3 FTCA	0.0003	U	µg/L	0.0003	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	914637-49-3	5:3 FTCA	0.00029	U	µg/L	0.00029	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	27619-97-2	62FTSA	0.00034	U	µg/L	0.00034	0.0045
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	27619-97-2	62FTSA	0.003	J	µg/L	0.00034	0.0044
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	812-70-4	7:3 FTCA	0.00049	U	µg/L	0.00049	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	812-70-4	7:3 FTCA	0.00049	U	µg/L	0.00049	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	39108-34-4	82FTSA	0.00056	U	µg/L	0.00056	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	39108-34-4	82FTSA	0.003		µg/L	0.00055	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	756426-58-1	9CLPF3ONSA	0.00038	U	µg/L	0.00038	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	756426-58-1	9CLPF3ONSA	0.00037	U	µg/L	0.00037	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	919005-14-4	ADONA	0.00046	U	µg/L	0.00046	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	919005-14-4	ADONA	0.00045	U	µg/L	0.00045	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	13252-13-6	HFPODA	0.00062	U	µg/L	0.00062	0.0036
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	13252-13-6	HFPODA	0.00061	U	µg/L	0.00061	0.0035
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	4151-50-2	NETFOSA	0.00066	U	µg/L	0.00066	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	4151-50-2	NETFOSA	0.00066	U	µg/L	0.00066	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	2991-50-6	NETFOSAA	0.0003	U	µg/L	0.0003	0.0045
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	2991-50-6	NETFOSAA	0.0003	U	µg/L	0.0003	0.0044
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	1691-99-2	NETFOSE	0.00065	U	µg/L	0.00065	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	1691-99-2	NETFOSE	0.00064	U	µg/L	0.00064	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	151772-58-6	NFDHA	0.00056	U	µg/L	0.00056	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	151772-58-6	NFDHA	0.00055	U	µg/L	0.00055	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	31506-32-8	NMEFOSA	0.00066	U	µg/L	0.00066	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	31506-32-8	NMEFOSA	0.00066	U	µg/L	0.00066	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	2355-31-9	NMEFOSAA	0.00041	U	µg/L	0.00041	0.0045
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	2355-31-9	NMEFOSAA	0.00041	U	µg/L	0.00041	0.0044
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	24448-09-7	NMEFOSE	0.00043	U	µg/L	0.00043	0.0036
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	24448-09-7	NMEFOSE	0.00043	U	µg/L	0.00043	0.0035

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0074		µg/L	0.0003	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0063		µg/L	0.0003	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.043		µg/L	0.00022	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.043		µg/L	0.00021	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00049	U	µg/L	0.00049	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00049	U	µg/L	0.00049	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.00073	J	µg/L	0.0003	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.00071	J	µg/L	0.00029	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00038	U	µg/L	0.00038	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00037	U	µg/L	0.00037	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00064	U	µg/L	0.00064	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00063	U	µg/L	0.00063	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.27		µg/L	0.00043	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.3		µg/L	0.00043	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0027		µg/L	0.00034	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0031		µg/L	0.00034	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.34		µg/L	0.00049	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.33		µg/L	0.00049	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00047	U	µg/L	0.00047	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00046	U	µg/L	0.00046	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00054	U	µg/L	0.00054	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00053	U	µg/L	0.00053	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00059	U	µg/L	0.00059	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00059	U	µg/L	0.00059	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.0019		µg/L	0.0005	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.002		µg/L	0.0005	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00047	U	µg/L	0.00047	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00054	J	µg/L	0.00046	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.01		µg/L	0.00052	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.011		µg/L	0.00051	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	2.9		µg/L	0.005	0.018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	3		µg/L	0.005	0.018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.0014	J	µg/L	0.00046	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.0013	J	µg/L	0.00045	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.083		µg/L	0.00022	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.089		µg/L	0.00021	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00046	U	µg/L	0.00046	0.0018

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00045	U	µg/L	0.00045	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.00062	U	µg/L	0.00062	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.00061	U	µg/L	0.00061	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.00065	U	µg/L	0.00065	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.00065	U	µg/L	0.00065	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	113507-82-7	PFEESA	0.00026	U	µg/L	0.00026	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	113507-82-7	PFEESA	0.00026	U	µg/L	0.00026	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	863090-89-5	PFMBA	0.00051	J	µg/L	0.00023	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	863090-89-5	PFMBA	0.00053	J	µg/L	0.00023	0.0018
PZ-140	6/3/22	WH	N	PZ140GWS009	E537M	377-73-1	PFMPA	0.00025	U	µg/L	0.00025	0.0018
PZ-140	6/3/22	WH	FD	PZ140GWD009	E537M	377-73-1	PFMPA	0.00025	U	µg/L	0.00025	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	120226-60-0	102FTSA	0.00042	U	µg/L	0.00042	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	763051-92-9	11CLPF3OUDSA	0.00043	U	µg/L	0.00043	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	356-02-5	3:3 FTCA	0.00039	U	µg/L	0.00039	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	757124-72-4	42FTSA	0.00032	U	µg/L	0.00032	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	914637-49-3	5:3 FTCA	0.0003	U	µg/L	0.0003	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	27619-97-2	62FTSA	0.00078	U	µg/L	0.00034	0.0045
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	812-70-4	7:3 FTCA	0.00049	U	µg/L	0.00049	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	39108-34-4	82FTSA	0.00056	U	µg/L	0.00056	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	756426-58-1	9CLPF3ONSA	0.00038	U	µg/L	0.00038	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	919005-14-4	ADONA	0.00046	U	µg/L	0.00046	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	13252-13-6	HFPODA	0.00062	U	µg/L	0.00062	0.0036
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	4151-50-2	NETFOSA	0.00066	U	µg/L	0.00066	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	2991-50-6	NETFOSAA	0.00031	U	µg/L	0.00031	0.0045
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	1691-99-2	NETFOSE	0.00065	U	µg/L	0.00065	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	151772-58-6	NFDHA	0.00056	U	µg/L	0.00056	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	31506-32-8	NMEFOSA	0.00066	U	µg/L	0.00066	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	2355-31-9	NMEFOSAA	0.00041	U	µg/L	0.00041	0.0045
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	24448-09-7	NMEFOSE	0.00043	U	µg/L	0.00043	0.0036
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0011	J	µg/L	0.00031	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.022		µg/L	0.00022	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00049	U	µg/L	0.00049	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.0003	U	µg/L	0.0003	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00038	U	µg/L	0.00038	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00064	U	µg/L	0.00064	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.017		µg/L	0.00043	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00047	J	µg/L	0.00034	0.0018

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.024		µg/L	0.00049	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00047	U	µg/L	0.00047	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00054	U	µg/L	0.00054	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00059	U	µg/L	0.00059	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.00075	J	µg/L	0.0005	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00047	U	µg/L	0.00047	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0058	U	µg/L	0.00052	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.07		µg/L	0.0005	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.00046	U	µg/L	0.00046	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0027		µg/L	0.00022	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00046	U	µg/L	0.00046	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.00062	U	µg/L	0.00062	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.00066	U	µg/L	0.00066	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	113507-82-7	PFEESA	0.00026	U	µg/L	0.00026	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	863090-89-5	PFMBA	0.00023	U	µg/L	0.00023	0.0018
PZ-154	6/1/22	WH	N	PZ154GWS004	E537M	377-73-1	PFMPA	0.00025	U	µg/L	0.00025	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	120226-60-0	102FTSA	0.00043	U	µg/L	0.00043	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	120226-60-0	102FTSA	0.00042	U	µg/L	0.00042	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	763051-92-9	11CLPF3OUDSA	0.00044	U	µg/L	0.00044	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	763051-92-9	11CLPF3OUDSA	0.00043	U	µg/L	0.00043	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	356-02-5	3:3 FTCA	0.00039	U	µg/L	0.00039	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	356-02-5	3:3 FTCA	0.00038	U	µg/L	0.00038	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	757124-72-4	42FTSA	0.00033	U	µg/L	0.00033	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	757124-72-4	42FTSA	0.00032	U	µg/L	0.00032	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	914637-49-3	5:3 FTCA	0.0003	U	µg/L	0.0003	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	914637-49-3	5:3 FTCA	0.00029	U	µg/L	0.00029	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	27619-97-2	62FTSA	0.00035	U	µg/L	0.00035	0.0045
RD-26	6/7/22	WC	N	RD26GWS005	E537M	27619-97-2	62FTSA	0.00034	U	µg/L	0.00034	0.0044
RD-26	7/28/22	WC	N	RD26GWS006	E537M	812-70-4	7:3 FTCA	0.0005	U	µg/L	0.0005	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	812-70-4	7:3 FTCA	0.00049	U	µg/L	0.00049	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	39108-34-4	82FTSA	0.00056	U	µg/L	0.00056	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	39108-34-4	82FTSA	0.00055	U	µg/L	0.00055	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	756426-58-1	9CLPF3ONSA	0.00037	U	µg/L	0.00037	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	756426-58-1	9CLPF3ONSA	0.00038	U	µg/L	0.00038	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	919005-14-4	ADONA	0.00045	U	µg/L	0.00045	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	919005-14-4	ADONA	0.00046	U	µg/L	0.00046	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	13252-13-6	HFPODA	0.00061	U	µg/L	0.00061	0.0035

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
RD-26	7/28/22	WC	N	RD26GWS006	E537M	13252-13-6	HFPODA	0.00063	U	µg/L	0.00063	0.0036
RD-26	7/28/22	WC	N	RD26GWS006	E537M	4151-50-2	NETFOSA	0.00067	U	µg/L	0.00067	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	4151-50-2	NETFOSA	0.00066	U	µg/L	0.00066	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	2991-50-6	NETFOSAA	0.00031	U	µg/L	0.00031	0.0045
RD-26	6/7/22	WC	N	RD26GWS005	E537M	2991-50-6	NETFOSAA	0.0003	U	µg/L	0.0003	0.0044
RD-26	7/28/22	WC	N	RD26GWS006	E537M	1691-99-2	NETFOSE	0.00065	U	µg/L	0.00065	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	1691-99-2	NETFOSE	0.00064	U	µg/L	0.00064	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	151772-58-6	NFDHA	0.00056	U	µg/L	0.00056	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	151772-58-6	NFDHA	0.00055	U	µg/L	0.00055	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	31506-32-8	NMEFOSA	0.00067	U	µg/L	0.00067	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	31506-32-8	NMEFOSA	0.00066	U	µg/L	0.00066	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	2355-31-9	NMEFOSAA	0.00042	U	µg/L	0.00042	0.0045
RD-26	6/7/22	WC	N	RD26GWS005	E537M	2355-31-9	NMEFOSAA	0.00041	U	µg/L	0.00041	0.0044
RD-26	7/28/22	WC	N	RD26GWS006	E537M	24448-09-7	NMEFOSE	0.00044	U	µg/L	0.00044	0.0036
RD-26	6/7/22	WC	N	RD26GWS005	E537M	24448-09-7	NMEFOSE	0.00043	U	µg/L	0.00043	0.0035
RD-26	7/28/22	WC	N	RD26GWS006	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0033		µg/L	0.00031	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0036		µg/L	0.0003	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.024		µg/L	0.00022	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.025		µg/L	0.00021	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0005	U	µg/L	0.0005	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00049	U	µg/L	0.00049	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.0003	U	µg/L	0.0003	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.00029	U	µg/L	0.00029	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00038	U	µg/L	0.00038	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00037	U	µg/L	0.00037	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00064	U	µg/L	0.00064	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00063	U	µg/L	0.00063	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.032		µg/L	0.00044	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.034		µg/L	0.00043	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.01		µg/L	0.00035	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.011		µg/L	0.00034	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.049		µg/L	0.0005	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.049		µg/L	0.00049	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00047	U	µg/L	0.00047	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00046	U	µg/L	0.00046	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00055	U	µg/L	0.00055	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00053	U	µg/L	0.00053	0.0018

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
RD-26	7/28/22	WC	N	RD26GWS006	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.0006	U	µg/L	0.0006	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00058	U	µg/L	0.00058	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.00094	J	µg/L	0.00051	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.0016	J	µg/L	0.0005	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00046	U	µg/L	0.00046	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00047	U	µg/L	0.00047	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0042		µg/L	0.00053	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0061		µg/L	0.00051	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.012		µg/L	0.00051	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.014		µg/L	0.0005	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.0036		µg/L	0.00046	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.0035		µg/L	0.00045	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.073		µg/L	0.00022	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.075		µg/L	0.00021	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00046	U	µg/L	0.00046	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00045	U	µg/L	0.00045	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.00063	U	µg/L	0.00063	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.00061	U	µg/L	0.00061	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.00066	U	µg/L	0.00066	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.00065	U	µg/L	0.00065	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	113507-82-7	PFEESA	0.00026	U	µg/L	0.00026	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	113507-82-7	PFEESA	0.00026	U	µg/L	0.00026	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	863090-89-5	PFMBA	0.00024	U	µg/L	0.00024	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	863090-89-5	PFMBA	0.00023	U	µg/L	0.00023	0.0018
RD-26	7/28/22	WC	N	RD26GWS006	E537M	377-73-1	PFMPA	0.00025	U	µg/L	0.00025	0.0018
RD-26	6/7/22	WC	N	RD26GWS005	E537M	377-73-1	PFMPA	0.00025	U	µg/L	0.00025	0.0018
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	120226-60-0	102FTSA	0.00039	U	µg/L	0.00039	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	763051-92-9	11CLPF3OUDSA	0.00039	U	µg/L	0.00039	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	356-02-5	3:3 FTCA	0.00035	U	µg/L	0.00035	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	757124-72-4	42FTSA	0.0003	U	µg/L	0.0003	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	914637-49-3	5:3 FTCA	0.00027	U	µg/L	0.00027	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	27619-97-2	62FTSA	0.00031	U	µg/L	0.00031	0.0041
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	812-70-4	7:3 FTCA	0.00045	U	µg/L	0.00045	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	39108-34-4	82FTSA	0.00051	U	µg/L	0.00051	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	756426-58-1	9CLPF3ONSA	0.00035	U	µg/L	0.00035	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	919005-14-4	ADONA	0.00042	U	µg/L	0.00042	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	13252-13-6	HFPODA	0.00057	U	µg/L	0.00057	0.0033

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	4151-50-2	NETFOSA	0.00061	U	µg/L	0.00061	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	2991-50-6	NETFOSAA	0.00028	U	µg/L	0.00028	0.0041
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	1691-99-2	NETFOSE	0.00059	U	µg/L	0.00059	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	151772-58-6	NFDHA	0.00051	U	µg/L	0.00051	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	31506-32-8	NMEFOSA	0.00061	U	µg/L	0.00061	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	2355-31-9	NMEFOSAA	0.00038	U	µg/L	0.00038	0.0041
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	24448-09-7	NMEFOSE	0.00039	U	µg/L	0.00039	0.0033
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0019		µg/L	0.00028	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.07		µg/L	0.0002	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00045	U	µg/L	0.00045	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.00027	U	µg/L	0.00027	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00035	U	µg/L	0.00035	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00058	U	µg/L	0.00058	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.012		µg/L	0.00039	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00095	J	µg/L	0.00031	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.018		µg/L	0.00045	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00043	U	µg/L	0.00043	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00049	U	µg/L	0.00049	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00054	U	µg/L	0.00054	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.023		µg/L	0.00046	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00043	U	µg/L	0.00043	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.00048	U	µg/L	0.00048	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.096		µg/L	0.00046	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.00042	U	µg/L	0.00042	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0035		µg/L	0.0002	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00042	U	µg/L	0.00042	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.00057	U	µg/L	0.00057	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0011	J	µg/L	0.0006	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	113507-82-7	PFEESA	0.00024	U	µg/L	0.00024	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	863090-89-5	PFMBA	0.00021	U	µg/L	0.00021	0.0016
RD-49A	6/1/22	WH	N	RD49AGW01S012	E537M	377-73-1	PFMPA	0.00023	U	µg/L	0.00023	0.0016
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	120226-60-0	102FTSA	0.00041	U	µg/L	0.00041	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	763051-92-9	11CLPF3OUDSA	0.00042	U	µg/L	0.00042	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	356-02-5	3:3 FTCA	0.00037	U	µg/L	0.00037	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	757124-72-4	42FTSA	0.00031	U	µg/L	0.00031	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	914637-49-3	5:3 FTCA	0.00029	U	µg/L	0.00029	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	27619-97-2	62FTSA	0.001	J	µg/L	0.00033	0.0043

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	812-70-4	7:3 FTCA	0.00048	U	µg/L	0.00048	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	39108-34-4	82FTSA	0.00054	U	µg/L	0.00054	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	756426-58-1	9CLPF3ONSA	0.00036	U	µg/L	0.00036	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	919005-14-4	ADONA	0.00044	U	µg/L	0.00044	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	13252-13-6	HFPODA	0.0006	U	µg/L	0.0006	0.0035
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	4151-50-2	NETFOSA	0.00064	U	µg/L	0.00064	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	2991-50-6	NETFOSAA	0.0003	U	µg/L	0.0003	0.0043
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	1691-99-2	NETFOSE	0.00063	U	µg/L	0.00063	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	151772-58-6	NFDHA	0.00054	U	µg/L	0.00054	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	31506-32-8	NMEFOSA	0.00064	U	µg/L	0.00064	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	2355-31-9	NMEFOSAA	0.0004	U	µg/L	0.0004	0.0043
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	24448-09-7	NMEFOSE	0.00042	U	µg/L	0.00042	0.0035
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0021		µg/L	0.0003	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.0058		µg/L	0.00021	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00048	U	µg/L	0.00048	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.00085	J	µg/L	0.00029	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	307-55-1	Perfluorododecanoic acid (PFDaA)	0.00036	U	µg/L	0.00036	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00062	U	µg/L	0.00062	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0059		µg/L	0.00042	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00049	J	µg/L	0.00033	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.0099		µg/L	0.00048	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00045	U	µg/L	0.00045	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00052	U	µg/L	0.00052	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00057	U	µg/L	0.00057	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.00057	J	µg/L	0.00049	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00045	U	µg/L	0.00045	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.002		µg/L	0.0005	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.017		µg/L	0.00049	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.00049	U	µg/L	0.00044	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0025		µg/L	0.00021	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00044	U	µg/L	0.00044	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.0006	U	µg/L	0.0006	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.00063	U	µg/L	0.00063	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	113507-82-7	PFEESA	0.00025	U	µg/L	0.00025	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	863090-89-5	PFMBA	0.00023	U	µg/L	0.00023	0.0017
RD-49B	6/2/22	WC	N	RD49BGW01S012	E537M	377-73-1	PFMPA	0.00024	U	µg/L	0.00024	0.0017
RD-79	5/25/22	WC	N	RD79GWS011	E537M	120226-60-0	102FTSA	0.00043	U	µg/L	0.00043	0.0018

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
RD-79	5/25/22	WC	N	RD79GWS011	E537M	763051-92-9	11CLPF3OUDSA	0.00044	U	µg/L	0.00044	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	356-02-5	3:3 FTCA	0.00039	U	µg/L	0.00039	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	757124-72-4	42FTSA	0.00033	U	µg/L	0.00033	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	914637-49-3	5:3 FTCA	0.0003	U	µg/L	0.0003	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	27619-97-2	62FTSA	0.00035	U	µg/L	0.00035	0.0046
RD-79	5/25/22	WC	N	RD79GWS011	E537M	812-70-4	7:3 FTCA	0.0005	U	µg/L	0.0005	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	39108-34-4	82FTSA	0.00056	U	µg/L	0.00056	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	756426-58-1	9CLPF3ONSA	0.00038	U	µg/L	0.00038	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	919005-14-4	ADONA	0.00046	U	µg/L	0.00046	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	13252-13-6	HFPODA	0.00063	U	µg/L	0.00063	0.0036
RD-79	5/25/22	WC	N	RD79GWS011	E537M	4151-50-2	NETFOSA	0.00067	U	µg/L	0.00067	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	2991-50-6	NETFOSAA	0.00031	U	µg/L	0.00031	0.0046
RD-79	5/25/22	WC	N	RD79GWS011	E537M	1691-99-2	NETFOSE	0.00066	U	µg/L	0.00066	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	151772-58-6	NFDHA	0.00056	U	µg/L	0.00056	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	31506-32-8	NMEFOSA	0.00067	U	µg/L	0.00067	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	2355-31-9	NMEFOSAA	0.00042	U	µg/L	0.00042	0.0046
RD-79	5/25/22	WC	N	RD79GWS011	E537M	24448-09-7	NMEFOSE	0.00044	U	µg/L	0.00044	0.0036
RD-79	5/25/22	WC	N	RD79GWS011	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.01		µg/L	0.00031	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.16		µg/L	0.00022	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0005	U	µg/L	0.0005	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.0096		µg/L	0.0003	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00038	U	µg/L	0.00038	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00065	U	µg/L	0.00065	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.047		µg/L	0.00044	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0026		µg/L	0.00035	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.061		µg/L	0.0005	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00047	U	µg/L	0.00047	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00055	U	µg/L	0.00055	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.0006	U	µg/L	0.0006	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.017		µg/L	0.00051	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00047	U	µg/L	0.00047	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.014		µg/L	0.00053	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.071		µg/L	0.00051	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.00046	U	µg/L	0.00046	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.048		µg/L	0.00022	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00046	U	µg/L	0.00046	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.00063	U	µg/L	0.00063	0.0018

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
RD-79	5/25/22	WC	N	RD79GWS011	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.00081	J	µg/L	0.00066	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	113507-82-7	PFEESA	0.00026	U	µg/L	0.00026	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	863090-89-5	PFMBA	0.00024	U	µg/L	0.00024	0.0018
RD-79	5/25/22	WC	N	RD79GWS011	E537M	377-73-1	PFMPA	0.00025	U	µg/L	0.00025	0.0018
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	120226-60-0	102FTSA	0.00041	U	µg/L	0.00041	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	763051-92-9	11CLPF3OUDSA	0.00042	U	µg/L	0.00042	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	356-02-5	3:3 FTCA	0.00037	U	µg/L	0.00037	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	757124-72-4	42FTSA	0.00031	U	µg/L	0.00031	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	914637-49-3	5:3 FTCA	0.00029	U	µg/L	0.00029	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	27619-97-2	62FTSA	0.00033	U	µg/L	0.00033	0.0043
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	812-70-4	7:3 FTCA	0.00048	U	µg/L	0.00048	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	39108-34-4	82FTSA	0.00054	U	µg/L	0.00054	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	756426-58-1	9CLPF3ONSA	0.00036	U	µg/L	0.00036	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	919005-14-4	ADONA	0.00044	U	µg/L	0.00044	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	13252-13-6	HFPODA	0.0006	U	µg/L	0.0006	0.0035
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	4151-50-2	NETFOSA	0.00064	U	µg/L	0.00064	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	2991-50-6	NETFOSAA	0.0003	U	µg/L	0.0003	0.0043
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	1691-99-2	NETFOSE	0.00063	U	µg/L	0.00063	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	151772-58-6	NFDHA	0.00054	U	µg/L	0.00054	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	31506-32-8	NMEFOSA	0.00064	U	µg/L	0.00064	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	2355-31-9	NMEFOSAA	0.0004	U	µg/L	0.0004	0.0043
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	24448-09-7	NMEFOSE	0.00042	U	µg/L	0.00042	0.0035
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.00085	J	µg/L	0.0003	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.0099		µg/L	0.00021	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00048	U	µg/L	0.00048	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.00029	U	µg/L	0.00029	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00043	J	µg/L	0.00036	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00062	U	µg/L	0.00062	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0036		µg/L	0.00042	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00034	U	µg/L	0.00033	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.0024		µg/L	0.00048	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00045	U	µg/L	0.00045	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00052	U	µg/L	0.00052	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00057	U	µg/L	0.00057	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.00091	J	µg/L	0.00049	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00045	U	µg/L	0.00045	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0005	U	µg/L	0.0005	0.0017

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.0068		µg/L	0.00049	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.00044	U	µg/L	0.00044	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0042		µg/L	0.00021	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00049	J	µg/L	0.00044	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.0017		µg/L	0.0006	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.00092	J	µg/L	0.00063	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	113507-82-7	PFEESA	0.00025	U	µg/L	0.00025	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	863090-89-5	PFMBA	0.00023	U	µg/L	0.00023	0.0017
RD-81-1	5/24/22	WC	N	RD81GW01S016	E537M	377-73-1	PFMPA	0.00024	U	µg/L	0.00024	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	120226-60-0	102FTSA	0.0004	U	µg/L	0.0004	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	120226-60-0	102FTSA	0.0004	U	µg/L	0.0004	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	763051-92-9	11CLPF3OUDSA	0.00041	U	µg/L	0.00041	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	763051-92-9	11CLPF3OUDSA	0.00041	U	µg/L	0.00041	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	356-02-5	3:3 FTCA	0.00037	U	µg/L	0.00037	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	356-02-5	3:3 FTCA	0.00037	U	µg/L	0.00037	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	757124-72-4	42FTSA	0.00031	U	µg/L	0.00031	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	757124-72-4	42FTSA	0.00031	U	µg/L	0.00031	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	914637-49-3	5:3 FTCA	0.00028	U	µg/L	0.00028	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	914637-49-3	5:3 FTCA	0.00028	U	µg/L	0.00028	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	27619-97-2	62FTSA	0.00033	U	µg/L	0.00033	0.0043
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	27619-97-2	62FTSA	0.00033	U	µg/L	0.00033	0.0043
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	812-70-4	7:3 FTCA	0.00047	U	µg/L	0.00047	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	812-70-4	7:3 FTCA	0.00047	U	µg/L	0.00047	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	39108-34-4	82FTSA	0.00053	U	µg/L	0.00053	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	39108-34-4	82FTSA	0.00053	U	µg/L	0.00053	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	756426-58-1	9CLPF3ONSA	0.00036	U	µg/L	0.00036	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	756426-58-1	9CLPF3ONSA	0.00036	U	µg/L	0.00036	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	919005-14-4	ADONA	0.00044	U	µg/L	0.00044	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	919005-14-4	ADONA	0.00044	U	µg/L	0.00044	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	13252-13-6	HFPODA	0.00059	U	µg/L	0.00059	0.0034
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	13252-13-6	HFPODA	0.00059	U	µg/L	0.00059	0.0034
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	4151-50-2	NETFOSA	0.00064	U	µg/L	0.00064	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	4151-50-2	NETFOSA	0.00064	U	µg/L	0.00064	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	2991-50-6	NETFOSAA	0.00029	U	µg/L	0.00029	0.0043
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	2991-50-6	NETFOSAA	0.00029	U	µg/L	0.00029	0.0043
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	1691-99-2	NETFOSE	0.00062	U	µg/L	0.00062	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	1691-99-2	NETFOSE	0.00062	U	µg/L	0.00062	0.0017

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	151772-58-6	NFDHA	0.00053	U	µg/L	0.00053	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	151772-58-6	NFDHA	0.00053	U	µg/L	0.00053	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	31506-32-8	NMEFOSA	0.00064	U	µg/L	0.00064	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	31506-32-8	NMEFOSA	0.00064	U	µg/L	0.00064	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	2355-31-9	NMEFOSAA	0.0004	U	µg/L	0.0004	0.0043
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	2355-31-9	NMEFOSAA	0.0004	U	µg/L	0.0004	0.0043
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	24448-09-7	NMEFOSE	0.00041	U	µg/L	0.00041	0.0034
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	24448-09-7	NMEFOSE	0.00041	U	µg/L	0.00041	0.0034
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.00029	U	µg/L	0.00029	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.00029	U	µg/L	0.00029	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.00021	U	µg/L	0.00021	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.00021	U	µg/L	0.00021	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00047	U	µg/L	0.00047	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00047	U	µg/L	0.00047	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.00028	U	µg/L	0.00028	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.00028	U	µg/L	0.00028	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00036	U	µg/L	0.00036	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00036	U	µg/L	0.00036	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00061	U	µg/L	0.00061	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00061	U	µg/L	0.00061	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.00041	U	µg/L	0.00041	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.00041	U	µg/L	0.00041	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00033	U	µg/L	0.00033	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00033	U	µg/L	0.00033	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.00047	U	µg/L	0.00047	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.00047	U	µg/L	0.00047	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00045	U	µg/L	0.00045	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00045	U	µg/L	0.00045	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00052	U	µg/L	0.00052	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00052	U	µg/L	0.00052	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00057	U	µg/L	0.00057	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00057	U	µg/L	0.00057	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.00048	U	µg/L	0.00048	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.00048	U	µg/L	0.00048	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00045	U	µg/L	0.00045	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00045	U	µg/L	0.00045	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0005	U	µg/L	0.0005	0.0017

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0005	U	µg/L	0.0005	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.00048	U	µg/L	0.00048	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.00048	U	µg/L	0.00048	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.00044	U	µg/L	0.00044	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.00044	U	µg/L	0.00044	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.00021	U	µg/L	0.00021	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.00021	U	µg/L	0.00021	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00044	U	µg/L	0.00044	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00044	U	µg/L	0.00044	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.00059	U	µg/L	0.00059	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.00059	U	µg/L	0.00059	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.00063	U	µg/L	0.00063	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.00063	U	µg/L	0.00063	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	113507-82-7	PFEESA	0.00025	U	µg/L	0.00025	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	113507-82-7	PFEESA	0.00025	U	µg/L	0.00025	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	863090-89-5	PFMBA	0.00022	U	µg/L	0.00022	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	863090-89-5	PFMBA	0.00022	U	µg/L	0.00022	0.0017
RD-82	5/25/22	WC	FD	RD82GW01D005	E537M	377-73-1	PFMPA	0.00024	U	µg/L	0.00024	0.0017
RD-82	5/25/22	WC	N	RD82GW01S005	E537M	377-73-1	PFMPA	0.00024	U	µg/L	0.00024	0.0017
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	120226-60-0	102FTSA	0.00043	U	µg/L	0.00043	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	120226-60-0	102FTSA	0.00043	U	µg/L	0.00043	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	763051-92-9	11CLPF3OUDSA	0.00044	U	µg/L	0.00044	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	763051-92-9	11CLPF3OUDSA	0.00044	U	µg/L	0.00044	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	356-02-5	3:3 FTCA	0.0004	U	µg/L	0.0004	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	356-02-5	3:3 FTCA	0.00039	U	µg/L	0.00039	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	757124-72-4	42FTSA	0.00033	U	µg/L	0.00033	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	757124-72-4	42FTSA	0.00033	U	µg/L	0.00033	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	914637-49-3	5:3 FTCA	0.00031	U	µg/L	0.00031	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	914637-49-3	5:3 FTCA	0.0003	U	µg/L	0.0003	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	27619-97-2	62FTSA	0.00035	U	µg/L	0.00035	0.0046
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	27619-97-2	62FTSA	0.00035	U	µg/L	0.00035	0.0046
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	812-70-4	7:3 FTCA	0.00051	U	µg/L	0.00051	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	812-70-4	7:3 FTCA	0.0005	U	µg/L	0.0005	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	39108-34-4	82FTSA	0.00057	U	µg/L	0.00057	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	39108-34-4	82FTSA	0.00057	U	µg/L	0.00057	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	756426-58-1	9CLPF3ONSA	0.00038	U	µg/L	0.00038	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	756426-58-1	9CLPF3ONSA	0.00039	U	µg/L	0.00039	0.0018

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	919005-14-4	ADONA	0.00047	U	µg/L	0.00047	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	919005-14-4	ADONA	0.00047	U	µg/L	0.00047	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	13252-13-6	HFPODA	0.00063	U	µg/L	0.00063	0.0036
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	13252-13-6	HFPODA	0.00064	U	µg/L	0.00064	0.0037
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	4151-50-2	NETFOSA	0.00068	U	µg/L	0.00068	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	4151-50-2	NETFOSA	0.00068	U	µg/L	0.00068	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	2991-50-6	NETFOSAA	0.00031	U	µg/L	0.00031	0.0046
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	2991-50-6	NETFOSAA	0.00031	U	µg/L	0.00031	0.0046
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	1691-99-2	NETFOSE	0.00067	U	µg/L	0.00067	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	1691-99-2	NETFOSE	0.00066	U	µg/L	0.00066	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	151772-58-6	NFDHA	0.00057	U	µg/L	0.00057	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	151772-58-6	NFDHA	0.00057	U	µg/L	0.00057	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	31506-32-8	NMEFOSA	0.00068	U	µg/L	0.00068	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	31506-32-8	NMEFOSA	0.00068	U	µg/L	0.00068	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	2355-31-9	NMEFOSAA	0.00043	U	µg/L	0.00043	0.0046
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	2355-31-9	NMEFOSAA	0.00042	U	µg/L	0.00042	0.0046
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	24448-09-7	NMEFOSE	0.00044	U	µg/L	0.00044	0.0037
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	24448-09-7	NMEFOSE	0.00044	U	µg/L	0.00044	0.0036
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.00031	U	µg/L	0.00031	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.00031	U	µg/L	0.00031	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.00025	J	µg/L	0.00022	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.00023	J	µg/L	0.00022	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.00051	U	µg/L	0.00051	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0005	U	µg/L	0.0005	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.00031	U	µg/L	0.00031	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.0003	U	µg/L	0.0003	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00039	U	µg/L	0.00039	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.00038	U	µg/L	0.00038	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00066	U	µg/L	0.00066	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.00065	U	µg/L	0.00065	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.00044	U	µg/L	0.00044	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.00044	U	µg/L	0.00044	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00035	U	µg/L	0.00035	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00035	U	µg/L	0.00035	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.00051	U	µg/L	0.00051	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.0005	U	µg/L	0.0005	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00048	U	µg/L	0.00048	0.0018

Table 3-3. NASA SSFL PFAS Groundwater Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Well ID	Sample Date	Sample Matrix	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.00047	U	µg/L	0.00047	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00055	U	µg/L	0.00055	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.00055	U	µg/L	0.00055	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.00061	U	µg/L	0.00061	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.0006	U	µg/L	0.0006	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.00052	U	µg/L	0.00052	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.00051	U	µg/L	0.00051	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00047	U	µg/L	0.00047	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.00048	U	µg/L	0.00048	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.00054	U	µg/L	0.00054	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.00053	U	µg/L	0.00053	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.00052	U	µg/L	0.00052	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.00051	U	µg/L	0.00051	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.00047	U	µg/L	0.00047	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.00047	U	µg/L	0.00047	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.00022	U	µg/L	0.00022	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.00022	U	µg/L	0.00022	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00047	U	µg/L	0.00047	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00047	U	µg/L	0.00047	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.00064	U	µg/L	0.00064	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.00063	U	µg/L	0.00063	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.00068	U	µg/L	0.00068	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.00067	U	µg/L	0.00067	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	113507-82-7	PFEESA	0.00027	U	µg/L	0.00027	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	113507-82-7	PFEESA	0.00026	U	µg/L	0.00026	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	863090-89-5	PFMBA	0.00024	U	µg/L	0.00024	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	863090-89-5	PFMBA	0.00024	U	µg/L	0.00024	0.0018
RD-83	7/29/22	WC	N	RD83GW01S012	E537M	377-73-1	PFMPA	0.00026	U	µg/L	0.00026	0.0018
RD-83	7/29/22	WC	FD	RD83GW01D012	E537M	377-73-1	PFMPA	0.00026	U	µg/L	0.00026	0.0018

J = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.

S = screening-level sample due to sampling method (e.g., parameter stabilization not achieved or limited purge performed due to well yield)

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was below the reported sample quantitation limit. However, the reported value is approximate.

µg/L = micrograms per liter

FD = field duplicate sample

ID = identification number

MDL = method detection limit

N = normal samples

RL = reporting limit

WC = Chatsowrth Formation groundwater

WH = near-surface groundwater

Table 3-4. NASA SSFL PFAS Soil Data Results

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater,
Santa Susana Field Laboratory, Ventura County, California

Analyte - PFAS (µg/kg)	CAS Number	A2BS1243 ^[a]	A2BS1243 ^[a]	A2BS1243 ^[a]	A2BS1244 ^[a]	AABS1262 ^[a]	AABS1262 ^[a]	AABS1263 ^[a]	AABS1264 ^[a]	AABS1265 ^[a]	BVBS1708 ^[a]	BVBS1708 ^[a]	BVBS1709 ^[a]
		A2BS1243S001 0 to 2 11/9/2022	A2BS1243D001 0 to 2 11/9/2022	A2BS1243S002 6 to 8 11/9/2022	A2BS1244S001 0 to 1.67 11/9/2022	AABS1262S001 0 to 2 11/11/2022	AABS1262S002 4.6 to 6.6 11/11/2022	AABS1263S001 0 to 2.1 11/11/2022	AABS1264S001 0 to 1.4 11/11/2022	AABS1265S001 0 to 1.8 11/10/2022	BVBS1708S001 0 to 2 11/17/2022	BVBS1708S002 4 to 6 11/17/2022	BVBS1709S001 0 to 1.8 11/17/2022
102FTSA	120226-60-0	0.038 U	0.037 U	0.036 U	0.036 U	0.036 U	0.036 U	0.037 U	0.037 U	0.038 U	0.038 U	0.038 U	0.035 U
11CLPF3OUDSA	763051-92-9	0.031 U	0.03 U	0.03 U	0.029 U	0.03 U	0.03 U	0.03 U	0.03 U	0.031 U	0.031 U	0.031 U	0.028 U
3:3 FTCA	356-02-5	0.041 UJ	0.04 UJ	0.039 UJ	0.038 UJ	0.039 UJ	0.039 UJ	0.04 UJ	0.04 UJ	0.041 UJ	0.041 UJ	0.041 UJ	0.038 UJ
42FTSA	757124-72-4	0.051 U	0.05 U	0.049 U	0.048 U	0.049 U	0.049 U	0.05 U	0.049 U	0.051 U	0.05 U	0.051 U	0.047 U
5:3 FTCA	914637-49-3	0.038 U	0.037 U	0.036 U	0.036 U	0.036 U	0.036 U	0.037 U	0.037 U	0.038 U	0.038 U	0.038 U	0.035 U
62FTSA	27619-97-2	0.027 UJ	0.027 UJ	0.026 UJ	0.025 UJ	0.026 UJ	0.026 UJ	0.026 UJ	0.026 U	0.027 UJ	0.027 UJ	0.027 UJ	0.025 UJ
7:3 FTCA	812-70-4	0.041 UJ	0.04 UJ	0.039 UJ	0.038 UJ	0.039 UJ	0.039 UJ	0.04 UJ	0.04 U	0.041 UJ	0.041 UJ	0.041 UJ	0.038 UJ
82FTSA	39108-34-4	0.035 U	0.034 U	0.033 U	0.033 U	0.034 U	0.034 U	0.034 U	0.034 U	0.035 U	0.035 U	0.035 U	0.032 U
9CLPF3ONSA	756426-58-1	0.035 U	0.034 U	0.033 U	0.033 U	0.034 U	0.034 U	0.034 U	0.034 U	0.035 U	0.035 U	0.035 UJ	0.032 U
ADONA	919005-14-4	0.039 U	0.038 U	0.037 U	0.036 U	0.037 U	0.037 U	0.038 U	0.038 U	0.039 U	0.039 U	0.039 U	0.036 U
HFPODA	13252-13-6	0.041 U	0.04 U	0.039 U	0.038 U	0.039 U	0.039 U	0.04 U	0.04 U	0.041 U	0.041 U	0.041 U	0.038 U
NETFOSA	4151-50-2	0.047 U	0.046 U	0.045 U	0.044 U	0.045 U	0.045 U	0.046 U	0.045 U	0.047 U	0.047 U	0.047 U	0.043 U
NETFOSAA	2991-50-6	0.048 U	0.047 U	0.046 U	0.097 [^] J	0.046 U	0.046 U	0.047 U	0.046 U	0.048 U	0.048 U	0.048 U	0.044 U
NETFOSE	1691-99-2	0.029 [^] J	0.028 U	0.027 U	0.035 [^] J	0.027 U	0.027 U	0.027 U	0.063 [^] J	0.028 U	0.028 U	0.028 U	0.026 U
NFDHA	151772-58-6	0.04 U	0.039 U	0.038 U	0.037 U	0.038 U	0.038 U	0.039 U	0.039 U	0.04 U	0.04 U	0.04 U	0.037 U
NMEFOSA	31506-32-8	0.049 U	0.048 U	0.047 U	0.046 U	0.047 U	0.047 U	0.048 U	0.047 U	0.049 U	0.049 U	0.049 U	0.045 U
NMEFOSAA	2355-31-9	0.023 U	0.023 U	0.022 U	0.021 U	0.022 U	0.022 UJ	0.022 U	0.022 U	0.023 U	0.023 U	0.023 U	0.021 U
NMEFOSE	24448-09-7	0.047 U	0.046 U	0.045 U	0.044 U	0.045 U	0.045 U	0.046 U	0.045 U	0.047 U	0.047 U	0.047 U	0.043 U
Perfluoro-n-hexadecanoic acid (PFHxDA)	67905-19-5	0.038 U	0.037 U	0.036 U	0.036 U	0.036 U	0.036 U	0.037 U	0.05 [^] J	0.038 U	0.038 U	0.038 U	0.035 U
Perfluoro-n-octadecanoic acid (PFODA)	16517-11-6	0.066 U	0.065 U	0.063 U	0.062 U	0.063 U	0.063 U	0.064 U	0.064 U	0.065 U	0.065 U	0.066 U	0.061 U
Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.038 U	0.037 U	0.036 U	0.036 U	0.036 U	0.036 U	0.037 U	0.037 U	0.038 U	0.038 U	0.038 U	0.035 U
Perfluorobutanoic acid (PFBA)	375-22-4	0.27 [^] J	0.25 [^] J	0.24 [^] J	0.14 [^] J	0.083 [^] J	0.044 UJ	0.045 U	0.044 U	0.16 U	0.046 U	0.046 UJ	0.042 U
Perfluorodecanesulfonic acid (PFDS)	335-77-3	0.052 U	0.051 U	0.05 U	0.049 U	0.05 U	0.05 U	0.13 [^] J	0.05 U	0.052 U	0.051 U	0.052 U	0.048 U
Perfluorodecanoic acid (PFDA)	335-76-2	0.048 U	0.047 U	0.046 U	0.056 [^] J	0.046 U	0.046 U	0.14 [^] J	0.31 [^]	0.048 U	0.089 [^] J	0.048 U	0.094 [^] J
Perfluorododecanoic acid (PFDoA)	307-55-1	0.03 U	0.029 U	0.029 U	0.044 [^] J	0.029 U	0.029 U	0.071 [^] J	0.48 [^]	0.03 U	0.07 [^] J	0.03 U	0.037 [^] J
Perfluoroheptanesulfonic acid (PFHpS)	375-92-8	0.049 U	0.048 U	0.047 U	0.046 U	0.047 U	0.047 U	0.048 U	0.047 U	0.049 U	0.049 U	0.049 U	0.045 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.038 U	0.039 [^] J	0.036 U	0.036 U	0.036 U	0.036 U	0.037 U	0.037 U	0.038 U	0.038 U	0.038 U	0.035 U
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.029 U	0.028 U	0.028 U	0.027 U	0.028 U	0.028 U	0.028 U	0.028 U	0.029 U	0.029 U	0.029 U	0.027 U
Perfluorohexanoic acid (PFHxA)	307-24-4	0.073 [^] J	0.07 [^] J	0.03 U	0.029 U	0.03 U	0.03 U	0.033 [^] J	0.03 U	0.031 U	0.031 U	0.031 U	0.028 U
Perfluorononanesulfonic acid (PFNS)	68259-12-1	0.029 U	0.028 U	0.028 U	0.027 U	0.028 U	0.028 U	0.028 U	0.028 U	0.029 U	0.029 U	0.029 U	0.027 U
Perfluorononanoic acid (PFNA)	375-95-1	0.026 [^] J	0.022 U	0.021 U	0.028 [^] J	0.023 [^] J	0.021 U	0.037 [^] J	0.12 [^] J	0.022 U	0.022 U	0.022 U	0.027 [^] J
Perfluorooctanesulfonamide (FOSA)	754-91-6	0.033 U	0.032 U	0.031 U	0.031 U	0.032 U	0.032 U	0.032 U	0.032 U	0.033 U	0.033 U	0.033 U	0.03 U
Perfluorooctanoic acid (PFOS)	1763-23-1	0.2 [^] J	0.15 [^] J	0.072 [^] J	0.62 [^]	0.096 [^] J	0.051 [^] J	0.3 [^]	0.17 U	0.086 [^] J	0.12 [^] J	0.055 [^] J	0.09 [^] J
Perfluorooctanoic acid (PFOA)	335-67-1	0.11 [^] J	0.1 [^] J	0.051 U	0.073 [^] J	1.2 [^]	2 [^]	0.5 [^]	0.22 [^] J	0.06 [^] J	0.065 [^] J	0.092 [^] J	0.088 [^] J
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	0.037 U	0.036 U	0.035 U	0.035 U	0.036 U	0.035 U	0.036 U	0.036 U	0.037 U	0.037 U	0.037 U	0.034 U
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.041 U	0.041 [^] J	0.039 U	0.038 U	0.039 U	0.039 U	0.04 U	0.04 U	0.041 U	0.041 U	0.041 U	0.038 U
Perfluorotetradecanoic acid (PFTeA)	376-06-7	0.037 U	0.036 U	0.035 U	0.035 U	0.036 U	0.035 U	0.036 U	0.21 [^]	0.037 U	0.037 U	0.037 UJ	0.034 U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.021 U	0.021 U	0.02 U	0.02 U	0.02 U	0.02 U	0.022 [^] J	0.3 [^]	0.021 U	0.034 [^] J	0.021 U	0.019 U
Perfluoroundecanoic acid (PFUnA)	2058-94-8	0.042 U	0.041 U	0.04 U	0.039 U	0.04 U	0.04 U	0.078 [^] J	0.44 [^]	0.042 U	0.061 [^] J	0.042 U	0.056 [^] J
PFEESA	113507-82-7	0.032 U	0.031 U	0.031 U	0.03 U	0.031 U	0.031 U	0.031 U	0.031 U	0.032 U	0.032 U	0.032 U	0.029 U
PFMBA	863090-89-5	0.045 U	0.044 U	0.043 U	0.042 U	0.043 U	0.043 UJ	0.044 U	0.043 U	0.045 U	0.045 U	0.045 UJ	0.041 U
PFMPA	377-73-1	0.024 U	0.024 U	0.023 U	0.022 U	0.023 U	0.023 U	0.023 U	0.023 U	0.024 U	0.024 U	0.024 U	0.022 U

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet the quality control criteria. The presence or absence of the analyte cannot be verified.
U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
UJ = The analyte was below the reported sample quantitation limit. However, the reported value is approximate.

^[a] Information identified is location ID, sample ID, sample depth (feet), and sample date.

Bold text with a ^ symbol indicates a detected analyte.

µg/kg = microgram(s) per kilogram

CAS = Chemical Abstracts Service

Table 3-4. NASA SSFL PFAS Soil Data Results

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater,
Santa Susana Field Laboratory, Ventura County, California

Analyte - PFAS (µg/kg)	CAS Number	CABS1324 ^[a]	CABS1324 ^[a]	CABS1325 ^[a]	CABS1325 ^[a]	DABS1284 ^[a]	EVBS2000 ^[a]	EVBS2000 ^[a]	EVBS2001 ^[a]	EVBS2002 ^[a]	EVBS2003 ^[a]	EVBS2004 ^[a]	EVBS2004 ^[a]
		CABS1324S001 0 to 2 11/14/2022	CABS1324S002 6 to 8 11/14/2022	CABS1325S001 0 to 2 11/14/2022	CABS1325S002 6 to 8 11/14/2022	DABS1284S001 0 to 1.1 11/11/2022	EVBS2000S001 0 to 2 11/17/2022	EVBS2000D001 0 to 2 11/17/2022	EVBS2001S001 0 to 1.6 11/17/2022	EVBS2002S001 0 to 0.75 11/17/2022	EVBS2003S001 0 to 2 11/10/2022	EVBS2004S001 0 to 2 11/10/2022	EVBS2004S002 2.5 to 4.5 11/10/2022
102FTSA	120226-60-0	0.036 U	0.035 U	0.037 U	0.037 U	0.037 U	0.037 U	0.036 U	0.034 U	0.036 U	0.21^	0.036 U	0.038 U
11CLPF3OUDSA	763051-92-9	0.029 U	0.028 U	0.03 UJ	0.03 UJ	0.03 U	0.03 U	0.03 U	0.028 U	0.03 UJ	0.031 U	0.029 U	0.031 U
3:3 FTCA	356-02-5	0.038 U	0.037 U	0.04 U	0.039 U	0.04 UJ	0.04 UJ	0.039 UJ	0.037 UJ	0.039 UJ	0.041 UJ	0.039 UJ	0.041 UJ
42FTSA	757124-72-4	0.048 U	0.047 U	0.049 U	0.049 U	0.049 U	0.05 U	0.049 U	0.046 U	0.049 U	0.05 U	0.048 U	0.051 U
5:3 FTCA	914637-49-3	0.036 U	0.035 U	0.037 U	0.037 U	0.037 U	0.037 U	0.036 U	0.034 U	0.045^ J	0.52^	0.12 U	0.038 U
62FTSA	27619-97-2	0.025 UJ	0.025^ R	0.026^ R	0.026 UJ	0.026 U	0.026 UJ	0.026 UJ	0.024 UJ	0.026 UJ	0.056^ J	0.025 UJ	0.027^ R
7:3 FTCA	812-70-4	0.038 UJ	0.037 UJ	0.04 UJ	0.039 UJ	0.04 U	0.13^ J	0.11^ J	0.037 UJ	0.07^ J	0.38^ J	0.11^ J	0.041^ R
82FTSA	39108-34-4	0.033 U	0.032 U	0.034 U	0.034 U	0.034 U	0.034 U	0.034 U	0.031 U	0.033 U	0.21^	0.033 U	0.035 U
9CLPF3ONSA	756426-58-1	0.033 U	0.032 U	0.034 UJ	0.034 UJ	0.034 U	0.034 U	0.034 U	0.031 U	0.033 UJ	0.035 U	0.033 U	0.035 U
ADONA	919005-14-4	0.036 U	0.036 U	0.038 U	0.038 U	0.038 U	0.038 U	0.037 U	0.035 U	0.037 U	0.039 U	0.037 U	0.039 U
HFPODA	13252-13-6	0.038 U	0.037 U	0.04 U	0.039 U	0.04 U	0.04 U	0.039 U	0.037 U	0.039 U	0.041 U	0.039 U	0.041 U
NETFOSA	4151-50-2	0.044 U	0.043 U	0.045 U	0.045 U	0.045 U	0.046 U	0.045 U	0.042 U	0.045 U	0.047 U	0.044 U	0.047 U
NETFOSAA	2991-50-6	0.045 U	0.044 U	0.046 U	0.046 U	0.046 U	0.18^ J	0.12^ J	0.043 U	0.046 U	0.048 U	0.045 U	0.048 U
NETFOSE	1691-99-2	0.026 U	0.026 U	0.027 UJ	0.027 U	0.027 U	0.027 U	0.027 U	0.025 U	0.027 U	0.028 U	0.026 U	0.028 U
NFDHA	151772-58-6	0.037 U	0.037 U	0.039 U	0.039 U	0.039 U	0.039 U	0.038 U	0.036 U	0.038 U	0.04 U	0.038 U	0.04 U
NMEFOSA	31506-32-8	0.046 U	0.045 U	0.047 U	0.047 U	0.047 U	0.048 U	0.047 U	0.044 U	0.047 U	0.049 U	0.046 U	0.049 U
NMEFOSAA	2355-31-9	0.021 U	0.021 U	0.022 U	0.022 U	0.022 U	0.023 U	0.022 U	0.021 U	0.044^ J	0.023 U	0.022 U	0.023 U
NMEFOSE	24448-09-7	0.044 U	0.043 U	0.045 UJ	0.045 U	0.045 U	0.046 U	0.045 U	0.042 U	0.066^ J	0.047 U	0.044 U	0.047 U
Perfluoro-n-hexadecanoic acid (PFHxDA)	67905-19-5	0.036 U	0.035 U	0.037 UJ	0.037 UJ	0.037 U	0.037 U	0.036 U	0.034 U	0.043 J	0.038 U	0.036 U	0.038 U
Perfluoro-n-octadecanoic acid (PFODA)	16517-11-6	0.062 U	0.06 U	0.064 UJ	0.064 UJ	0.064 U	0.065 U	0.063 U	0.059 U	0.063 U	0.065 U	0.062 U	0.065 U
Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.036 U	0.035 U	0.037 U	0.037 U	0.037 U	0.037 U	0.036 U	0.034 U	0.036 U	0.038 U	0.036 U	0.038 U
Perfluorobutanoic acid (PFBA)	375-22-4	0.043 U	0.042 U	0.044 U	0.044 U	0.044 U	0.063^ J	0.059^ J	0.09^ J	0.095^ J	0.47 U	0.17 U	0.17 U
Perfluorodecanesulfonic acid (PFDS)	335-77-3	0.049 U	0.048 U	0.05 U	0.05 U	0.05 U	0.087^ J	0.091^ J	0.047 U	0.05 U	0.051 U	0.049 U	0.052 U
Perfluorodecanoic acid (PFDA)	335-76-2	0.045 U	0.044 U	0.046 U	0.046 U	0.046 U	0.052^ J	0.057^ J	0.12^ J	0.31^	0.15^ J	0.045 U	0.048 U
Perfluorododecanoic acid (PFDoA)	307-55-1	0.028 U	0.027 U	0.029 U	0.029 U	0.029 U	0.17^ J	0.17^ J	0.036^ J	0.14 J	0.03 U	0.028 U	0.03 U
Perfluoroheptanesulfonic acid (PFHpS)	375-92-8	0.046 U	0.045 U	0.047 U	0.047 U	0.047 U	0.048 U	0.047 U	0.044 U	0.047 U	0.049 U	0.046 U	0.049 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.036 U	0.035 U	0.037 U	0.037 U	0.037 U	0.037 U	0.036 U	0.039^ J	0.036 U	0.74^	0.05^ J	0.088^ J
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.027 U	0.027 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.026 U	0.028 U	0.029 U	0.027 U	0.032^ J
Perfluorohexanoic acid (PFHxA)	307-24-4	0.029 U	0.028 U	0.032^ J	0.03 U	0.03 U	0.035^ J	0.03 U	0.028 U	0.03 U	1.7^	0.04^ J	0.045^ J
Perfluorononanesulfonic acid (PFNS)	68259-12-1	0.027 U	0.027 U	0.028 U	0.028 U	0.028 U	0.028 U	0.028 U	0.026 U	0.028 U	0.029 U	0.027 U	0.029 U
Perfluorononanoic acid (PFNA)	375-95-1	0.021 U	0.02 U	0.021 U	0.021 U	0.021 U	0.022 U	0.021 U	0.062^ J	0.098^ J	0.12^ J	0.06^ J	0.035^ J
Perfluorooctanesulfonamide (FOSA)	754-91-6	0.031 U	0.03 U	0.032 U	0.032 U	0.032 U	0.04^ J	0.04^ J	0.03 U	0.031 U	0.033 U	0.031 U	0.033 U
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.044^ J	0.039 U	0.042 U	0.041 U	0.042 U	0.17^ J	0.19^ J	0.34^	0.51^	0.058^ J	0.29^	0.32^
Perfluorooctanoic acid (PFOA)	335-67-1	0.05^ J	0.048 U	0.051 U	0.051 U	0.054^ J	0.4^	0.35^	0.38^	0.22^ J	0.71^	0.41^	0.33^
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	0.035 U	0.034 U	0.036 U	0.036 U	0.036 U	0.036 U	0.035 U	0.033 U	0.035 U	0.037 U	0.035 U	0.037 U
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.038 U	0.037 U	0.04 U	0.039 U	0.04 U	0.04 U	0.039 U	0.037 U	0.039 U	1.9^	0.039^ J	0.046^ J
Perfluorotetradecanoic acid (PFTeA)	376-06-7	0.035 U	0.034 U	0.036 UJ	0.036 U	0.036 U	0.066^ J	0.059^ J	0.033 U	0.08^ J	0.037 U	0.035 U	0.037 U
Perfluorotridecanoic acid (PFTeA)	72629-94-8	0.02 U	0.019 U	0.02 U	0.02 U	0.02 U	0.061^ J	0.061^ J	0.019 U	0.068^ J	0.021 U	0.02 U	0.021 U
Perfluoroundecanoic acid (PFUnA)	2058-94-8	0.039 U	0.038 U	0.041 U	0.04 U	0.041 U	0.067 U	0.061^ J	0.038 U	0.1^ J	0.042 U	0.04 U	0.042 U
PFEEESA	113507-82-7	0.03 U	0.029 U	0.031 U	0.031 U	0.031 U	0.031 U	0.031 U	0.029 U	0.03 U	0.032 U	0.03 U	0.032 U
PFMBA	863090-89-5	0.042 U	0.041 U	0.044 U	0.043 U	0.044 U	0.044 UJ	0.043 U	0.04 UJ	0.043 UJ	0.045 UJ	0.042 UJ	0.045 U
PFMPA	377-73-1	0.022 U	0.022 U	0.023 U	0.023 U	0.023 U	0.023 U	0.023 U	0.022 U	0.023 U	0.024 U	0.023 U	0.024 U

J = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.

R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet the quality control criteria. The presence or absence of the analyte cannot be verified.

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Bold text with a ^ symbol indicates a detected analyte.

µg/kg = microgram(s) per kilogram

CAS = Chemical Abstracts Service

Table 3-4. NASA SSFL PFAS Soil Data Results

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater,
Santa Susana Field Laboratory, Ventura County, California

Analyte - PFAS (µg/kg)	CAS Number	APBS1245 ^[a]	APBS1245 ^[a]	APBS1246 ^[a]	APBS1246 ^[a]
		APBS1245S001 0 to 2 11/10/2022	APBS1245S002 6 to 8 11/10/2022	APBS1246S001 0 to 2 11/10/2022	APBS1246S002 4 to 6 11/10/2022
102FTSA	120226-60-0	0.035 U	0.035 U	0.036 U	0.036 U
11CLPF3OUDSA	763051-92-9	0.028 U	0.028 U	0.029 U	0.029 U
3:3 FTCA	356-02-5	0.038 UJ	0.037 UJ	0.039 UJ	0.038 UJ
42FTSA	757124-72-4	0.047 U	0.047 U	0.048 U	0.048 U
5:3 FTCA	914637-49-3	0.035 U	0.035 U	0.036 U	0.036 U
62FTSA	27619-97-2	0.025 UJ	0.15^ J	0.026 UJ	0.025^ R
7:3 FTCA	812-70-4	0.038 UJ	0.037^ R	0.046^ J	0.038 UJ
82FTSA	39108-34-4	0.032 U	0.032 U	0.033 U	0.033 U
9CLPF3ONSA	756426-58-1	0.032 U	0.032 U	0.033 U	0.033 U
ADONA	919005-14-4	0.036 U	0.036 U	0.037 U	0.037 U
HFPODA	13252-13-6	0.038 U	0.037 U	0.039 U	0.038 U
NETFOSA	4151-50-2	0.043 U	0.043 U	0.045 U	0.044 U
NETFOSAA	2991-50-6	0.044 U	0.044 U	0.046 U	0.045 U
NETFOSE	1691-99-2	0.026 U	0.026 U	0.027 U	0.026 U
NFDHA	151772-58-6	0.037 U	0.036 U	0.038 U	0.038 U
NMEFOSA	31506-32-8	0.045 U	0.045 U	0.046 U	0.046 U
NMEFOSAA	2355-31-9	0.021 U	0.021 UJ	0.023^ J	0.022 UJ
NMEFOSE	24448-09-7	0.043 U	0.043 U	0.045 U	0.044 U
Perfluoro-n-hexadecanoic acid (PFHxDA)	67905-19-5	0.035 U	0.035 U	0.036 U	0.036 U
Perfluoro-n-octadecanoic acid (PFODA)	16517-11-6	0.06 U	0.06 U	0.063 U	0.062 U
Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.035 U	0.035 U	0.036 U	0.036 U
Perfluorobutanoic acid (PFBA)	375-22-4	0.19 U	0.19 U	0.18 U	0.17 U
Perfluorodecanesulfonic acid (PFDS)	335-77-3	0.048 U	0.047 U	0.049 U	0.049 U
Perfluorodecanoic acid (PFDA)	335-76-2	0.044 U	0.044 U	0.046 U	0.045 U
Perfluorododecanoic acid (PFDoA)	307-55-1	0.027 U	0.027 U	0.028 U	0.028 U
Perfluoroheptanesulfonic acid (PFHpS)	375-92-8	0.045 U	0.045 U	0.046 U	0.046 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.052^ J	0.043^ J	0.036 U	0.036 U
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.027 U	0.026 U	0.028 U	0.027 U
Perfluorohexanoic acid (PFHxA)	307-24-4	0.06^ J	0.061^ J	0.029 U	0.029 U
Perfluorononanesulfonic acid (PFNS)	68259-12-1	0.027 U	0.026 U	0.028 U	0.027 U
Perfluorononanoic acid (PFNA)	375-95-1	0.02 U	0.02 U	0.046^ J	0.021 U
Perfluorooctanesulfonamide (FOSA)	754-91-6	0.03 U	0.03 U	0.031 U	0.031 U
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.17^ J	0.18^ J	0.21^ J	0.062^ J
Perfluorooctanoic acid (PFOA)	335-67-1	0.4^	0.28^	0.1^ J	0.12^ J
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4	0.034 U	0.034 U	0.035 U	0.035 U
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.16^ J	0.076^ J	0.039 U	0.038 U
Perfluorotetradecanoic acid (PFTeA)	376-06-7	0.034 U	0.034 U	0.035 U	0.035 U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.019 U	0.019 U	0.021^ J	0.02 U
Perfluoroundecanoic acid (PFUnA)	2058-94-8	0.038 U	0.038 U	0.04 U	0.039 U
PFEESA	113507-82-7	0.029 U	0.029 U	0.03 U	0.03 U
PFMBA	863090-89-5	0.041 UJ	0.041 U	0.043 UJ	0.042 U
PFMPA	377-73-1	0.022 U	0.022 U	0.023 U	0.023 U

J = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.

R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet the quality control criteria. The presence or absence of the analyte cannot be verified.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was below the reported sample quantitation limit. However, the reported value is approximate.

^[a] Information identified is location ID, sample ID, sample depth (feet), and sample date.

Bold text with a ^ symbol indicates a detected analyte.

µg/kg = microgram(s) per kilogram

CAS = Chemical Abstracts Service

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Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	120226-60-0	102FTSA	0.038	U	µg/kg	0.038	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	120226-60-0	102FTSA	0.037	U	µg/kg	0.037	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	763051-92-9	11CLPF3OUDSA	0.031	U	µg/kg	0.031	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	763051-92-9	11CLPF3OUDSA	0.03	U	µg/kg	0.03	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	356-02-5	3:3 FTCA	0.041	UJ	µg/kg	0.041	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	356-02-5	3:3 FTCA	0.04	UJ	µg/kg	0.04	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	757124-72-4	42FTSA	0.051	U	µg/kg	0.051	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	757124-72-4	42FTSA	0.05	U	µg/kg	0.05	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	914637-49-3	5:3 FTCA	0.038	U	µg/kg	0.038	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	914637-49-3	5:3 FTCA	0.037	U	µg/kg	0.037	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	27619-97-2	62FTSA	0.027	UJ	µg/kg	0.027	0.3
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	27619-97-2	62FTSA	0.027	UJ	µg/kg	0.027	0.29
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	812-70-4	7:3 FTCA	0.041	UJ	µg/kg	0.041	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	812-70-4	7:3 FTCA	0.04	UJ	µg/kg	0.04	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	39108-34-4	82FTSA	0.035	U	µg/kg	0.035	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	39108-34-4	82FTSA	0.034	U	µg/kg	0.034	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	756426-58-1	9CLPF3ONSA	0.035	U	µg/kg	0.035	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	756426-58-1	9CLPF3ONSA	0.034	U	µg/kg	0.034	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	919005-14-4	ADONA	0.039	U	µg/kg	0.039	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	919005-14-4	ADONA	0.038	U	µg/kg	0.038	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	13252-13-6	HFPODA	0.041	U	µg/kg	0.041	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	13252-13-6	HFPODA	0.04	U	µg/kg	0.04	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	4151-50-2	NETFOSA	0.047	U	µg/kg	0.047	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	4151-50-2	NETFOSA	0.046	U	µg/kg	0.046	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	2991-50-6	NETFOSAA	0.048	U	µg/kg	0.048	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	2991-50-6	NETFOSAA	0.047	U	µg/kg	0.047	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	1691-99-2	NETFOSE	0.029	J	µg/kg	0.028	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	1691-99-2	NETFOSE	0.028	U	µg/kg	0.028	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	151772-58-6	NFDHA	0.04	U	µg/kg	0.04	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	151772-58-6	NFDHA	0.039	U	µg/kg	0.039	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	31506-32-8	NMEFOSA	0.049	U	µg/kg	0.049	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	31506-32-8	NMEFOSA	0.048	U	µg/kg	0.048	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	2355-31-9	NMEFOSAA	0.023	U	µg/kg	0.023	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	2355-31-9	NMEFOSAA	0.023	U	µg/kg	0.023	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	24448-09-7	NMEFOSE	0.047	U	µg/kg	0.047	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	24448-09-7	NMEFOSE	0.046	U	µg/kg	0.046	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.038	U	µg/kg	0.038	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.037	U	µg/kg	0.037	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.27	J	µg/kg	0.046	0.3
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.25	J	µg/kg	0.045	0.29
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.052	U	µg/kg	0.052	0.2

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.051	U	µg/kg	0.051	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.048	U	µg/kg	0.048	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.047	U	µg/kg	0.047	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.03	U	µg/kg	0.03	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.029	U	µg/kg	0.029	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.049	U	µg/kg	0.049	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.048	U	µg/kg	0.048	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.038	U	µg/kg	0.038	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.039	J	µg/kg	0.037	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.029	U	µg/kg	0.029	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.028	U	µg/kg	0.028	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.073	J	µg/kg	0.031	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.07	J	µg/kg	0.03	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.038	U	µg/kg	0.038	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.037	U	µg/kg	0.037	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.066	U	µg/kg	0.066	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.065	U	µg/kg	0.065	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.029	U	µg/kg	0.029	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.028	U	µg/kg	0.028	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.026	J	µg/kg	0.022	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.022	U	µg/kg	0.022	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.033	U	µg/kg	0.033	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.032	U	µg/kg	0.032	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.2	J	µg/kg	0.043	0.3
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.15	J	µg/kg	0.042	0.29
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.11	J	µg/kg	0.053	0.3
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.1	J	µg/kg	0.052	0.29
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.037	U	µg/kg	0.037	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.036	U	µg/kg	0.036	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.041	U	µg/kg	0.041	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.041	J	µg/kg	0.04	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.037	U	µg/kg	0.037	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.036	U	µg/kg	0.036	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.021	U	µg/kg	0.021	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.021	U	µg/kg	0.021	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.042	U	µg/kg	0.042	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.041	U	µg/kg	0.041	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	113507-82-7	PFEESA	0.032	U	µg/kg	0.032	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	113507-82-7	PFEESA	0.031	U	µg/kg	0.031	0.2
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	863090-89-5	PFMBA	0.045	U	µg/kg	0.045	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	863090-89-5	PFMBA	0.044	U	µg/kg	0.044	0.2

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
A2BS1243	11/9/22	Soil	0	2	N	A2BS1243S001	E537M	377-73-1	PFMPA	0.024	U	µg/kg	0.024	0.2
A2BS1243	11/9/22	Soil	0	2	FD	A2BS1243D001	E537M	377-73-1	PFMPA	0.024	U	µg/kg	0.024	0.2
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	120226-60-0	102FTSA	0.036	U	µg/kg	0.036	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	763051-92-9	11CLPF3OUDSA	0.03	U	µg/kg	0.03	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	356-02-5	3:3 FTCA	0.039	UJ	µg/kg	0.039	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	757124-72-4	42FTSA	0.049	U	µg/kg	0.049	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	914637-49-3	5:3 FTCA	0.036	U	µg/kg	0.036	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	27619-97-2	62FTSA	0.026	UJ	µg/kg	0.026	0.29
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	812-70-4	7:3 FTCA	0.039	UJ	µg/kg	0.039	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	39108-34-4	82FTSA	0.033	U	µg/kg	0.033	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	756426-58-1	9CLPF3ONSA	0.033	U	µg/kg	0.033	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	919005-14-4	ADONA	0.037	U	µg/kg	0.037	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	13252-13-6	HFPODA	0.039	U	µg/kg	0.039	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	4151-50-2	NETFOSA	0.045	U	µg/kg	0.045	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	2991-50-6	NETFOSAA	0.046	U	µg/kg	0.046	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	1691-99-2	NETFOSE	0.027	U	µg/kg	0.027	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	151772-58-6	NFDHA	0.038	U	µg/kg	0.038	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	31506-32-8	NMEFOSA	0.047	U	µg/kg	0.047	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	2355-31-9	NMEFOSAA	0.022	U	µg/kg	0.022	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	24448-09-7	NMEFOSE	0.045	U	µg/kg	0.045	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.036	U	µg/kg	0.036	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.24	J	µg/kg	0.044	0.29
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.05	U	µg/kg	0.05	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.046	U	µg/kg	0.046	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.029	U	µg/kg	0.029	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.047	U	µg/kg	0.047	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.036	U	µg/kg	0.036	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.028	U	µg/kg	0.028	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.03	U	µg/kg	0.03	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.036	U	µg/kg	0.036	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.063	U	µg/kg	0.063	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.028	U	µg/kg	0.028	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.021	U	µg/kg	0.021	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.031	U	µg/kg	0.031	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.072	J	µg/kg	0.041	0.29
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.051	U	µg/kg	0.051	0.29
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.035	U	µg/kg	0.035	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.039	U	µg/kg	0.039	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.035	U	µg/kg	0.035	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.02	U	µg/kg	0.02	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.04	U	µg/kg	0.04	0.19

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	113507-82-7	PFEESA	0.031	U	µg/kg	0.031	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	863090-89-5	PFMBA	0.043	U	µg/kg	0.043	0.19
A2BS1243	11/9/22	Soil	6	8	N	A2BS1243S002	E537M	377-73-1	PFMPA	0.023	U	µg/kg	0.023	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	120226-60-0	102FTSA	0.036	U	µg/kg	0.036	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	763051-92-9	11CLPF3OUDSA	0.029	U	µg/kg	0.029	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	356-02-5	3:3 FTCA	0.038	UJ	µg/kg	0.038	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	757124-72-4	42FTSA	0.048	U	µg/kg	0.048	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	914637-49-3	5:3 FTCA	0.036	U	µg/kg	0.036	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	27619-97-2	62FTSA	0.025	UJ	µg/kg	0.025	0.28
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	812-70-4	7:3 FTCA	0.038	UJ	µg/kg	0.038	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	39108-34-4	82FTSA	0.033	U	µg/kg	0.033	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	756426-58-1	9CLPF3ONSA	0.033	U	µg/kg	0.033	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	919005-14-4	ADONA	0.036	U	µg/kg	0.036	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	13252-13-6	HFPODA	0.038	U	µg/kg	0.038	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	4151-50-2	NETFOSA	0.044	U	µg/kg	0.044	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	2991-50-6	NETFOSAA	0.097	J	µg/kg	0.045	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	1691-99-2	NETFOSE	0.035	J	µg/kg	0.026	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	151772-58-6	NFDHA	0.037	U	µg/kg	0.037	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	31506-32-8	NMEFOSA	0.046	U	µg/kg	0.046	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	2355-31-9	NMEFOSAA	0.021	U	µg/kg	0.021	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	24448-09-7	NMEFOSE	0.044	U	µg/kg	0.044	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.036	U	µg/kg	0.036	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.14	J	µg/kg	0.043	0.28
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.049	U	µg/kg	0.049	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.056	J	µg/kg	0.045	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.044	J	µg/kg	0.028	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.046	U	µg/kg	0.046	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.036	U	µg/kg	0.036	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.027	U	µg/kg	0.027	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.029	U	µg/kg	0.029	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.036	U	µg/kg	0.036	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.062	U	µg/kg	0.062	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.027	U	µg/kg	0.027	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.028	J	µg/kg	0.021	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.031	U	µg/kg	0.031	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.62		µg/kg	0.04	0.28
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.073	J	µg/kg	0.05	0.28
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.035	U	µg/kg	0.035	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.038	U	µg/kg	0.038	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.035	U	µg/kg	0.035	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	72629-94-8	Perfluorotridecanoic acid (PFTTrDA)	0.02	U	µg/kg	0.02	0.19

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.039	U	µg/kg	0.039	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	113507-82-7	PFEESA	0.03	U	µg/kg	0.03	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	863090-89-5	PFMBA	0.042	U	µg/kg	0.042	0.19
A2BS1244	11/9/22	Soil	0	1.67	N	A2BS1244S001	E537M	377-73-1	PFMPA	0.022	U	µg/kg	0.022	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	120226-60-0	102FTSA	0.036	U	µg/kg	0.036	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	763051-92-9	11CLPF30UDSA	0.03	U	µg/kg	0.03	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	356-02-5	3:3 FTCA	0.039	UJ	µg/kg	0.039	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	757124-72-4	42FTSA	0.049	U	µg/kg	0.049	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	914637-49-3	5:3 FTCA	0.036	U	µg/kg	0.036	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	27619-97-2	62FTSA	0.026	UJ	µg/kg	0.026	0.29
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	812-70-4	7:3 FTCA	0.039	UJ	µg/kg	0.039	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	39108-34-4	82FTSA	0.034	U	µg/kg	0.034	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	756426-58-1	9CLPF30NSA	0.034	U	µg/kg	0.034	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	919005-14-4	ADONA	0.037	U	µg/kg	0.037	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	13252-13-6	HFPODA	0.039	U	µg/kg	0.039	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	4151-50-2	NETFOSA	0.045	U	µg/kg	0.045	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	2991-50-6	NETFOSAA	0.046	U	µg/kg	0.046	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	1691-99-2	NETFOSE	0.027	U	µg/kg	0.027	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	151772-58-6	NFDHA	0.038	U	µg/kg	0.038	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	31506-32-8	NMEFOSA	0.047	U	µg/kg	0.047	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	2355-31-9	NMEFOSAA	0.022	U	µg/kg	0.022	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	24448-09-7	NMEFOSE	0.045	U	µg/kg	0.045	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.036	U	µg/kg	0.036	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.083	J	µg/kg	0.044	0.29
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.05	U	µg/kg	0.05	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.046	U	µg/kg	0.046	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.029	U	µg/kg	0.029	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.047	U	µg/kg	0.047	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.036	U	µg/kg	0.036	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.028	U	µg/kg	0.028	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.03	U	µg/kg	0.03	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.036	U	µg/kg	0.036	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.063	U	µg/kg	0.063	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.028	U	µg/kg	0.028	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.023	J	µg/kg	0.021	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.032	U	µg/kg	0.032	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.096	J	µg/kg	0.041	0.29
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	1.2		µg/kg	0.051	0.29
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.036	U	µg/kg	0.036	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.039	U	µg/kg	0.039	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.036	U	µg/kg	0.036	0.19

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.02	U	µg/kg	0.02	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.04	U	µg/kg	0.04	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	113507-82-7	PFEESA	0.031	U	µg/kg	0.031	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	863090-89-5	PFMBA	0.043	U	µg/kg	0.043	0.19
AABS1262	11/11/22	Soil	0	2	N	AABS1262S001	E537M	377-73-1	PFMPA	0.023	U	µg/kg	0.023	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	120226-60-0	102FTSA	0.036	U	µg/kg	0.036	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	763051-92-9	11CLPF3OUDSA	0.03	U	µg/kg	0.03	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	356-02-5	3:3 FTCA	0.039	UJ	µg/kg	0.039	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	757124-72-4	42FTSA	0.049	U	µg/kg	0.049	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	914637-49-3	5:3 FTCA	0.036	U	µg/kg	0.036	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	27619-97-2	62FTSA	0.026	UJ	µg/kg	0.026	0.29
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	812-70-4	7:3 FTCA	0.039	UJ	µg/kg	0.039	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	39108-34-4	82FTSA	0.034	U	µg/kg	0.034	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	756426-58-1	9CLPF3ONSA	0.034	U	µg/kg	0.034	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	919005-14-4	ADONA	0.037	U	µg/kg	0.037	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	13252-13-6	HFPODA	0.039	U	µg/kg	0.039	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	4151-50-2	NETFOSA	0.045	U	µg/kg	0.045	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	2991-50-6	NETFOSAA	0.046	U	µg/kg	0.046	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	1691-99-2	NETFOSE	0.027	U	µg/kg	0.027	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	151772-58-6	NFDHA	0.038	U	µg/kg	0.038	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	31506-32-8	NMEFOSA	0.047	U	µg/kg	0.047	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	2355-31-9	NMEFOSAA	0.022	UJ	µg/kg	0.022	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	24448-09-7	NMEFOSE	0.045	U	µg/kg	0.045	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.036	U	µg/kg	0.036	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.044	UJ	µg/kg	0.044	0.29
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.05	U	µg/kg	0.05	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.046	U	µg/kg	0.046	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.029	U	µg/kg	0.029	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.047	U	µg/kg	0.047	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.036	U	µg/kg	0.036	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	355-46-4	Perfluoroheptanesulfonic acid (PFHxS)	0.028	U	µg/kg	0.028	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	307-24-4	Perfluoroheptanoic acid (PFHxA)	0.03	U	µg/kg	0.03	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.036	U	µg/kg	0.036	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.063	U	µg/kg	0.063	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.028	U	µg/kg	0.028	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.021	U	µg/kg	0.021	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.032	U	µg/kg	0.032	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.051	J	µg/kg	0.041	0.29
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	2		µg/kg	0.051	0.29
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.035	U	µg/kg	0.035	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.039	U	µg/kg	0.039	0.19

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.035	U	µg/kg	0.035	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.02	U	µg/kg	0.02	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.04	U	µg/kg	0.04	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	113507-82-7	PFEESA	0.031	U	µg/kg	0.031	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	863090-89-5	PFMBA	0.043	UJ	µg/kg	0.043	0.19
AABS1262	11/11/22	Soil	4.6	6.6	N	AABS1262S002	E537M	377-73-1	PFMPA	0.023	U	µg/kg	0.023	0.19
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	120226-60-0	102FTSA	0.037	U	µg/kg	0.037	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	763051-92-9	11CLPF3OUDSA	0.03	U	µg/kg	0.03	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	356-02-5	3:3 FTCA	0.04	UJ	µg/kg	0.04	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	757124-72-4	42FTSA	0.05	U	µg/kg	0.05	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	914637-49-3	5:3 FTCA	0.037	U	µg/kg	0.037	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	27619-97-2	62FTSA	0.026	UJ	µg/kg	0.026	0.29
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	812-70-4	7:3 FTCA	0.04	UJ	µg/kg	0.04	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	39108-34-4	82FTSA	0.034	U	µg/kg	0.034	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	756426-58-1	9CLPF3ONSA	0.034	U	µg/kg	0.034	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	919005-14-4	ADONA	0.038	U	µg/kg	0.038	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	13252-13-6	HFPODA	0.04	U	µg/kg	0.04	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	4151-50-2	NETFOSA	0.046	U	µg/kg	0.046	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	2991-50-6	NETFOSAA	0.047	U	µg/kg	0.047	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	1691-99-2	NETFOSE	0.027	U	µg/kg	0.027	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	151772-58-6	NFDHA	0.039	U	µg/kg	0.039	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	31506-32-8	NMEFOSA	0.048	U	µg/kg	0.048	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	2355-31-9	NMEFOSAA	0.022	U	µg/kg	0.022	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	24448-09-7	NMEFOSE	0.046	U	µg/kg	0.046	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.037	U	µg/kg	0.037	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.045	U	µg/kg	0.045	0.29
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.13	J	µg/kg	0.051	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.14	J	µg/kg	0.047	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.071	J	µg/kg	0.029	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.048	U	µg/kg	0.048	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.037	U	µg/kg	0.037	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.028	U	µg/kg	0.028	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.033	J	µg/kg	0.03	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.037	U	µg/kg	0.037	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.064	U	µg/kg	0.064	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.028	U	µg/kg	0.028	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.037	J	µg/kg	0.021	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.032	U	µg/kg	0.032	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.3		µg/kg	0.042	0.29
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.5		µg/kg	0.052	0.29
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.036	U	µg/kg	0.036	0.2

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.04	U	µg/kg	0.04	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.036	U	µg/kg	0.036	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.022	J	µg/kg	0.021	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.078	J	µg/kg	0.041	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	113507-82-7	PFEESA	0.031	U	µg/kg	0.031	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	863090-89-5	PFMBA	0.044	U	µg/kg	0.044	0.2
AABS1263	11/11/22	Soil	0	2.1	N	AABS1263S001	E537M	377-73-1	PFMPA	0.023	U	µg/kg	0.023	0.2
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	120226-60-0	102FTSA	0.037	U	µg/kg	0.037	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	763051-92-9	11CLPF3OUDSA	0.03	U	µg/kg	0.03	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	356-02-5	3:3 FTCA	0.04	UJ	µg/kg	0.04	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	757124-72-4	42FTSA	0.049	U	µg/kg	0.049	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	914637-49-3	5:3 FTCA	0.037	U	µg/kg	0.037	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	27619-97-2	62FTSA	0.026	U	µg/kg	0.026	0.29
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	812-70-4	7:3 FTCA	0.04	U	µg/kg	0.04	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	39108-34-4	82FTSA	0.034	U	µg/kg	0.034	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	756426-58-1	9CLPF3ONSA	0.034	U	µg/kg	0.034	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	919005-14-4	ADONA	0.038	U	µg/kg	0.038	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	13252-13-6	HFPODA	0.04	U	µg/kg	0.04	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	4151-50-2	NETFOSA	0.045	U	µg/kg	0.045	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	2991-50-6	NETFOSAA	0.046	U	µg/kg	0.046	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	1691-99-2	NETFOSE	0.063	J	µg/kg	0.027	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	151772-58-6	NFDHA	0.039	U	µg/kg	0.039	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	31506-32-8	NMEFOSA	0.047	U	µg/kg	0.047	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	2355-31-9	NMEFOSAA	0.022	U	µg/kg	0.022	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	24448-09-7	NMEFOSE	0.045	U	µg/kg	0.045	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.037	U	µg/kg	0.037	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.044	U	µg/kg	0.044	0.29
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.05	U	µg/kg	0.05	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.31		µg/kg	0.046	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.48		µg/kg	0.029	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.047	U	µg/kg	0.047	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.037	U	µg/kg	0.037	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.028	U	µg/kg	0.028	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.03	U	µg/kg	0.03	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.05	J	µg/kg	0.037	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.064	U	µg/kg	0.064	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.028	U	µg/kg	0.028	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.12	J	µg/kg	0.021	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.032	U	µg/kg	0.032	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.17	U	µg/kg	0.042	0.29
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.22	J	µg/kg	0.051	0.29

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.036	U	µg/kg	0.036	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.04	U	µg/kg	0.04	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.21		µg/kg	0.036	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.3		µg/kg	0.02	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.44		µg/kg	0.041	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	113507-82-7	PFEESA	0.031	U	µg/kg	0.031	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	863090-89-5	PFMBA	0.043	U	µg/kg	0.043	0.19
AABS1264	11/11/22	Soil	0	1.4	N	AABS1264S001	E537M	377-73-1	PFMPA	0.023	U	µg/kg	0.023	0.19
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	120226-60-0	102FTSA	0.038	U	µg/kg	0.038	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	763051-92-9	11CLPF3OUDSA	0.031	U	µg/kg	0.031	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	356-02-5	3:3 FTCA	0.041	UJ	µg/kg	0.041	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	757124-72-4	4:2FTSA	0.051	U	µg/kg	0.051	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	914637-49-3	5:3 FTCA	0.038	U	µg/kg	0.038	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	27619-97-2	6:2FTSA	0.027	UJ	µg/kg	0.027	0.3
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	812-70-4	7:3 FTCA	0.041	UJ	µg/kg	0.041	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	39108-34-4	8:2FTSA	0.035	U	µg/kg	0.035	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	756426-58-1	9CLPF3ONSA	0.035	U	µg/kg	0.035	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	919005-14-4	ADONA	0.039	U	µg/kg	0.039	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	13252-13-6	HFPODA	0.041	U	µg/kg	0.041	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	4151-50-2	NETFOSA	0.047	U	µg/kg	0.047	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	2991-50-6	NETFOSAA	0.048	U	µg/kg	0.048	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	1691-99-2	NETFOSE	0.028	U	µg/kg	0.028	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	151772-58-6	NFDHA	0.04	U	µg/kg	0.04	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	31506-32-8	NMEFOSA	0.049	U	µg/kg	0.049	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	2355-31-9	NMEFOSAA	0.023	U	µg/kg	0.023	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	24448-09-7	NMEFOSE	0.047	U	µg/kg	0.047	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.038	U	µg/kg	0.038	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.16	U	µg/kg	0.046	0.3
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.052	U	µg/kg	0.052	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.048	U	µg/kg	0.048	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.03	U	µg/kg	0.03	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.049	U	µg/kg	0.049	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.038	U	µg/kg	0.038	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.029	U	µg/kg	0.029	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.031	U	µg/kg	0.031	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.038	U	µg/kg	0.038	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.065	U	µg/kg	0.065	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.029	U	µg/kg	0.029	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.022	U	µg/kg	0.022	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.033	U	µg/kg	0.033	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.086	J	µg/kg	0.043	0.3

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.06	J	µg/kg	0.053	0.3
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.037	U	µg/kg	0.037	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.041	U	µg/kg	0.041	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.037	U	µg/kg	0.037	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.021	U	µg/kg	0.021	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.042	U	µg/kg	0.042	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	113507-82-7	PFEEESA	0.032	U	µg/kg	0.032	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	863090-89-5	PFMBA	0.045	U	µg/kg	0.045	0.2
AABS1265	11/10/22	Soil	0	1.8	N	AABS1265S001	E537M	377-73-1	PFMPA	0.024	U	µg/kg	0.024	0.2
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	120226-60-0	102FTSA	0.035	U	µg/kg	0.035	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	763051-92-9	11CLPF3OUDSA	0.028	U	µg/kg	0.028	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	356-02-5	3:3 FTCA	0.038	UJ	µg/kg	0.038	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	757124-72-4	42FTSA	0.047	U	µg/kg	0.047	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	914637-49-3	5:3 FTCA	0.035	U	µg/kg	0.035	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	27619-97-2	62FTSA	0.025	UJ	µg/kg	0.025	0.27
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	812-70-4	7:3 FTCA	0.038	UJ	µg/kg	0.038	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	39108-34-4	82FTSA	0.032	U	µg/kg	0.032	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	756426-58-1	9CLPF3ONSA	0.032	U	µg/kg	0.032	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	919005-14-4	ADONA	0.036	U	µg/kg	0.036	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	13252-13-6	HFPODA	0.038	U	µg/kg	0.038	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	4151-50-2	NETFOSA	0.043	U	µg/kg	0.043	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	2991-50-6	NETFOSAA	0.044	U	µg/kg	0.044	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	1691-99-2	NETFOSE	0.026	U	µg/kg	0.026	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	151772-58-6	NFDHA	0.037	U	µg/kg	0.037	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	31506-32-8	NMEFOSA	0.045	U	µg/kg	0.045	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	2355-31-9	NMEFOSAA	0.021	U	µg/kg	0.021	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	24448-09-7	NMEFOSE	0.043	U	µg/kg	0.043	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.035	U	µg/kg	0.035	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.19	U	µg/kg	0.042	0.27
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.048	U	µg/kg	0.048	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.044	U	µg/kg	0.044	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.027	U	µg/kg	0.027	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.045	U	µg/kg	0.045	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.052	J	µg/kg	0.035	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.027	U	µg/kg	0.027	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.06	J	µg/kg	0.028	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.035	U	µg/kg	0.035	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.06	U	µg/kg	0.06	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.027	U	µg/kg	0.027	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.02	U	µg/kg	0.02	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.03	U	µg/kg	0.03	0.18

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.17	J	µg/kg	0.039	0.27
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.4		µg/kg	0.049	0.27
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.034	U	µg/kg	0.034	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.16	J	µg/kg	0.038	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.034	U	µg/kg	0.034	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.019	U	µg/kg	0.019	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.038	U	µg/kg	0.038	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	113507-82-7	PFEESA	0.029	U	µg/kg	0.029	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	863090-89-5	PFMBA	0.041	UJ	µg/kg	0.041	0.18
APBS1245	11/10/22	Soil	0	2	N	APBS1245S001	E537M	377-73-1	PFMPA	0.022	U	µg/kg	0.022	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	120226-60-0	102FTSA	0.035	U	µg/kg	0.035	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	763051-92-9	11CLPF3OUDSA	0.028	U	µg/kg	0.028	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	356-02-5	3:3 FTCA	0.037	UJ	µg/kg	0.037	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	757124-72-4	42FTSA	0.047	U	µg/kg	0.047	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	914637-49-3	5:3 FTCA	0.035	U	µg/kg	0.035	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	27619-97-2	62FTSA	0.15	J	µg/kg	0.025	0.27
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	812-70-4	7:3 FTCA	0.037	R	µg/kg	0.037	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	39108-34-4	82FTSA	0.032	U	µg/kg	0.032	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	756426-58-1	9CLPF3ONSA	0.032	U	µg/kg	0.032	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	919005-14-4	ADONA	0.036	U	µg/kg	0.036	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	13252-13-6	HFPODA	0.037	U	µg/kg	0.037	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	4151-50-2	NETFOSA	0.043	U	µg/kg	0.043	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	2991-50-6	NETFOSAA	0.044	U	µg/kg	0.044	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	1691-99-2	NETFOSE	0.026	U	µg/kg	0.026	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	151772-58-6	NFDHA	0.036	U	µg/kg	0.036	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	31506-32-8	NMEFOSA	0.045	U	µg/kg	0.045	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	2355-31-9	NMEFOSAA	0.021	UJ	µg/kg	0.021	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	24448-09-7	NMEFOSE	0.043	U	µg/kg	0.043	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.035	U	µg/kg	0.035	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.19	U	µg/kg	0.042	0.27
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	335-77-3	Perfluorodecane sulfonic acid (PFDS)	0.047	U	µg/kg	0.047	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.044	U	µg/kg	0.044	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.027	U	µg/kg	0.027	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.045	U	µg/kg	0.045	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.043	J	µg/kg	0.035	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.026	U	µg/kg	0.026	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.061	J	µg/kg	0.028	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.035	U	µg/kg	0.035	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.06	U	µg/kg	0.06	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.026	U	µg/kg	0.026	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.02	U	µg/kg	0.02	0.18

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.03	U	µg/kg	0.03	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.18	J	µg/kg	0.039	0.27
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.28		µg/kg	0.048	0.27
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.034	U	µg/kg	0.034	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.076	J	µg/kg	0.037	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.034	U	µg/kg	0.034	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.019	U	µg/kg	0.019	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.038	U	µg/kg	0.038	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	113507-82-7	PFEESA	0.029	U	µg/kg	0.029	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	863090-89-5	PFMBA	0.041	U	µg/kg	0.041	0.18
APBS1245	11/10/22	Soil	6	8	N	APBS1245S002	E537M	377-73-1	PFMPA	0.022	U	µg/kg	0.022	0.18
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	120226-60-0	102FTSA	0.036	U	µg/kg	0.036	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	763051-92-9	11CLPF3OUDSA	0.029	U	µg/kg	0.029	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	356-02-5	3:3 FTCA	0.039	UJ	µg/kg	0.039	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	757124-72-4	42FTSA	0.048	U	µg/kg	0.048	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	914637-49-3	5:3 FTCA	0.036	U	µg/kg	0.036	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	27619-97-2	62FTSA	0.026	UJ	µg/kg	0.026	0.28
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	812-70-4	7:3 FTCA	0.046	J	µg/kg	0.039	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	39108-34-4	82FTSA	0.033	U	µg/kg	0.033	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	756426-58-1	9CLPF3ONSA	0.033	U	µg/kg	0.033	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	919005-14-4	ADONA	0.037	U	µg/kg	0.037	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	13252-13-6	HFPODA	0.039	U	µg/kg	0.039	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	4151-50-2	NETFOSA	0.045	U	µg/kg	0.045	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	2991-50-6	NETFOSAA	0.046	U	µg/kg	0.046	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	1691-99-2	NETFOSE	0.027	U	µg/kg	0.027	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	151772-58-6	NFDHA	0.038	U	µg/kg	0.038	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	31506-32-8	NMEFOSA	0.046	U	µg/kg	0.046	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	2355-31-9	NMEFOSAA	0.023	J	µg/kg	0.022	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	24448-09-7	NMEFOSE	0.045	U	µg/kg	0.045	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.036	U	µg/kg	0.036	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.18	U	µg/kg	0.044	0.28
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.049	U	µg/kg	0.049	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.046	U	µg/kg	0.046	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.028	U	µg/kg	0.028	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.046	U	µg/kg	0.046	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.036	U	µg/kg	0.036	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.028	U	µg/kg	0.028	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.029	U	µg/kg	0.029	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.036	U	µg/kg	0.036	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.063	U	µg/kg	0.063	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	68259-12-1	Perfluoronanesulfonic acid (PFNS)	0.028	U	µg/kg	0.028	0.19

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.046	J	µg/kg	0.021	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.031	U	µg/kg	0.031	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.21	J	µg/kg	0.041	0.28
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.1	J	µg/kg	0.05	0.28
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.035	U	µg/kg	0.035	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.039	U	µg/kg	0.039	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.035	U	µg/kg	0.035	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.021	J	µg/kg	0.02	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.04	U	µg/kg	0.04	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	113507-82-7	PFEESA	0.03	U	µg/kg	0.03	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	863090-89-5	PFMBA	0.043	UJ	µg/kg	0.043	0.19
APBS1246	11/10/22	Soil	0	2	N	APBS1246S001	E537M	377-73-1	PFMPA	0.023	U	µg/kg	0.023	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	120226-60-0	102FTSA	0.036	U	µg/kg	0.036	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	763051-92-9	11CLPF3OUDSA	0.029	U	µg/kg	0.029	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	356-02-5	3:3 FTCA	0.038	UJ	µg/kg	0.038	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	757124-72-4	4:2FTSA	0.048	U	µg/kg	0.048	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	914637-49-3	5:3 FTCA	0.036	U	µg/kg	0.036	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	27619-97-2	6:2FTSA	0.025	R	µg/kg	0.025	0.28
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	812-70-4	7:3 FTCA	0.038	UJ	µg/kg	0.038	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	39108-34-4	8:2FTSA	0.033	U	µg/kg	0.033	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	756426-58-1	9CLPF3ONSA	0.033	U	µg/kg	0.033	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	919005-14-4	ADONA	0.037	U	µg/kg	0.037	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	13252-13-6	HFPODA	0.038	U	µg/kg	0.038	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	4151-50-2	NETFOSA	0.044	U	µg/kg	0.044	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	2991-50-6	NETFOSAA	0.045	U	µg/kg	0.045	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	1691-99-2	NETFOSE	0.026	U	µg/kg	0.026	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	151772-58-6	NFDHA	0.038	U	µg/kg	0.038	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	31506-32-8	NMEFOSA	0.046	U	µg/kg	0.046	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	2355-31-9	NMEFOSAA	0.022	UJ	µg/kg	0.022	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	24448-09-7	NMEFOSE	0.044	U	µg/kg	0.044	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.036	U	µg/kg	0.036	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.17	U	µg/kg	0.043	0.28
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.049	U	µg/kg	0.049	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.045	U	µg/kg	0.045	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.028	U	µg/kg	0.028	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.046	U	µg/kg	0.046	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.036	U	µg/kg	0.036	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.027	U	µg/kg	0.027	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.029	U	µg/kg	0.029	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.036	U	µg/kg	0.036	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.062	U	µg/kg	0.062	0.19

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.027	U	µg/kg	0.027	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.021	U	µg/kg	0.021	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.031	U	µg/kg	0.031	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.062	J	µg/kg	0.04	0.28
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.12	J	µg/kg	0.05	0.28
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.035	U	µg/kg	0.035	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.038	U	µg/kg	0.038	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.035	U	µg/kg	0.035	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.02	U	µg/kg	0.02	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.039	U	µg/kg	0.039	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	113507-82-7	PFEESA	0.03	U	µg/kg	0.03	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	863090-89-5	PFMBA	0.042	U	µg/kg	0.042	0.19
APBS1246	11/10/22	Soil	4	6	N	APBS1246S002	E537M	377-73-1	PFMPA	0.023	U	µg/kg	0.023	0.19
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	120226-60-0	102FTSA	0.038	U	µg/kg	0.038	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	763051-92-9	11CLPF3OUDSA	0.031	U	µg/kg	0.031	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	356-02-5	3:3 FTCA	0.041	UJ	µg/kg	0.041	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	757124-72-4	42FTSA	0.05	U	µg/kg	0.05	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	914637-49-3	5:3 FTCA	0.038	U	µg/kg	0.038	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	27619-97-2	62FTSA	0.027	UJ	µg/kg	0.027	0.3
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	812-70-4	7:3 FTCA	0.041	UJ	µg/kg	0.041	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	39108-34-4	82FTSA	0.035	U	µg/kg	0.035	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	756426-58-1	9CLPF3ONSA	0.035	U	µg/kg	0.035	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	919005-14-4	ADONA	0.039	U	µg/kg	0.039	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	13252-13-6	HFPODA	0.041	U	µg/kg	0.041	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	4151-50-2	NETFOSA	0.047	U	µg/kg	0.047	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	2991-50-6	NETFOSAA	0.048	U	µg/kg	0.048	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	1691-99-2	NETFOSE	0.028	U	µg/kg	0.028	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	151772-58-6	NFDHA	0.04	U	µg/kg	0.04	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	31506-32-8	NMEFOSA	0.049	U	µg/kg	0.049	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	2355-31-9	NMEFOSAA	0.023	U	µg/kg	0.023	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	24448-09-7	NMEFOSE	0.047	U	µg/kg	0.047	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.038	U	µg/kg	0.038	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.046	U	µg/kg	0.046	0.3
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.051	U	µg/kg	0.051	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.089	J	µg/kg	0.048	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.07	J	µg/kg	0.03	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.049	U	µg/kg	0.049	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.038	U	µg/kg	0.038	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.029	U	µg/kg	0.029	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.031	U	µg/kg	0.031	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.038	U	µg/kg	0.038	0.2

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.065	U	µg/kg	0.065	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.029	U	µg/kg	0.029	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.022	U	µg/kg	0.022	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.033	U	µg/kg	0.033	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.12	J	µg/kg	0.043	0.3
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.065	J	µg/kg	0.052	0.3
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.037	U	µg/kg	0.037	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.041	U	µg/kg	0.041	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.037	U	µg/kg	0.037	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	72629-94-8	Perfluorotridecanoic acid (PFTTrDA)	0.034	J	µg/kg	0.021	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.061	J	µg/kg	0.042	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	113507-82-7	PFEEESA	0.032	U	µg/kg	0.032	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	863090-89-5	PFMBA	0.045	U	µg/kg	0.045	0.2
BVBS1708	11/17/22	Soil	0	2	N	BVBS1708S001	E537M	377-73-1	PFMPA	0.024	U	µg/kg	0.024	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	120226-60-0	102FTSA	0.038	U	µg/kg	0.038	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	763051-92-9	11CLPF3OUDSA	0.031	UJ	µg/kg	0.031	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	356-02-5	3:3 FTCA	0.041	UJ	µg/kg	0.041	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	757124-72-4	42FTSA	0.051	U	µg/kg	0.051	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	914637-49-3	5:3 FTCA	0.038	U	µg/kg	0.038	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	27619-97-2	62FTSA	0.027	UJ	µg/kg	0.027	0.3
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	812-70-4	7:3 FTCA	0.041	UJ	µg/kg	0.041	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	39108-34-4	82FTSA	0.035	U	µg/kg	0.035	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	756426-58-1	9CLPF3ONSA	0.035	UJ	µg/kg	0.035	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	919005-14-4	ADONA	0.039	U	µg/kg	0.039	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	13252-13-6	HFPODA	0.041	U	µg/kg	0.041	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	4151-50-2	NETFOSA	0.047	U	µg/kg	0.047	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	2991-50-6	NETFOSAA	0.048	U	µg/kg	0.048	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	1691-99-2	NETFOSE	0.028	U	µg/kg	0.028	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	151772-58-6	NFDHA	0.04	U	µg/kg	0.04	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	31506-32-8	NMEFOSA	0.049	U	µg/kg	0.049	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	2355-31-9	NMEFOSAA	0.023	U	µg/kg	0.023	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	24448-09-7	NMEFOSE	0.047	U	µg/kg	0.047	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.038	U	µg/kg	0.038	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.046	UJ	µg/kg	0.046	0.3
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.052	U	µg/kg	0.052	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.048	U	µg/kg	0.048	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.03	U	µg/kg	0.03	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.049	U	µg/kg	0.049	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.038	U	µg/kg	0.038	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.029	U	µg/kg	0.029	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.031	U	µg/kg	0.031	0.2

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.038	U	µg/kg	0.038	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.066	U	µg/kg	0.066	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.029	U	µg/kg	0.029	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.022	U	µg/kg	0.022	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.033	U	µg/kg	0.033	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.055	J	µg/kg	0.043	0.3
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.092	J	µg/kg	0.053	0.3
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.037	U	µg/kg	0.037	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.041	U	µg/kg	0.041	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.037	UJ	µg/kg	0.037	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.021	U	µg/kg	0.021	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.042	U	µg/kg	0.042	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	113507-82-7	PFEESA	0.032	U	µg/kg	0.032	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	863090-89-5	PFMBA	0.045	UJ	µg/kg	0.045	0.2
BVBS1708	11/17/22	Soil	4	6	N	BVBS1708S002	E537M	377-73-1	PFMPA	0.024	U	µg/kg	0.024	0.2
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	120226-60-0	102FTSA	0.035	U	µg/kg	0.035	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	763051-92-9	11CLPF30UDSA	0.028	U	µg/kg	0.028	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	356-02-5	3:3 FTCA	0.038	UJ	µg/kg	0.038	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	757124-72-4	42FTSA	0.047	U	µg/kg	0.047	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	914637-49-3	5:3 FTCA	0.035	U	µg/kg	0.035	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	27619-97-2	62FTSA	0.025	UJ	µg/kg	0.025	0.28
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	812-70-4	7:3 FTCA	0.038	UJ	µg/kg	0.038	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	39108-34-4	82FTSA	0.032	U	µg/kg	0.032	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	756426-58-1	9CLPF3ONSA	0.032	U	µg/kg	0.032	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	919005-14-4	ADONA	0.036	U	µg/kg	0.036	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	13252-13-6	HFPODA	0.038	U	µg/kg	0.038	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	4151-50-2	NETFOSA	0.043	U	µg/kg	0.043	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	2991-50-6	NETFOSAA	0.044	U	µg/kg	0.044	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	1691-99-2	NETFOSE	0.026	U	µg/kg	0.026	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	151772-58-6	NFDHA	0.037	U	µg/kg	0.037	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	31506-32-8	NMEFOSA	0.045	U	µg/kg	0.045	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	2355-31-9	NMEFOSAA	0.021	U	µg/kg	0.021	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	24448-09-7	NMEFOSE	0.043	U	µg/kg	0.043	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.035	U	µg/kg	0.035	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.042	U	µg/kg	0.042	0.28
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.048	U	µg/kg	0.048	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.094	J	µg/kg	0.044	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.037	J	µg/kg	0.028	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.045	U	µg/kg	0.045	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.035	U	µg/kg	0.035	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.027	U	µg/kg	0.027	0.18

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.028	U	µg/kg	0.028	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.035	U	µg/kg	0.035	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.061	U	µg/kg	0.061	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.027	U	µg/kg	0.027	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.027	J	µg/kg	0.02	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.03	U	µg/kg	0.03	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.09	J	µg/kg	0.039	0.28
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.088	J	µg/kg	0.049	0.28
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.034	U	µg/kg	0.034	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.038	U	µg/kg	0.038	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.034	U	µg/kg	0.034	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.019	U	µg/kg	0.019	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.056	J	µg/kg	0.039	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	113507-82-7	PFEESA	0.029	U	µg/kg	0.029	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	863090-89-5	PFMBA	0.041	U	µg/kg	0.041	0.18
BVBS1709	11/17/22	Soil	0	1.8	N	BVBS1709S001	E537M	377-73-1	PFMPA	0.022	U	µg/kg	0.022	0.18
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	120226-60-0	102FTSA	0.036	U	µg/kg	0.036	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	763051-92-9	11CLPF3OUDSA	0.029	U	µg/kg	0.029	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	356-02-5	3:3 FTCA	0.038	U	µg/kg	0.038	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	757124-72-4	42FTSA	0.048	U	µg/kg	0.048	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	914637-49-3	5:3 FTCA	0.036	U	µg/kg	0.036	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	27619-97-2	62FTSA	0.025	UJ	µg/kg	0.025	0.28
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	812-70-4	7:3 FTCA	0.038	UJ	µg/kg	0.038	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	39108-34-4	82FTSA	0.033	U	µg/kg	0.033	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	756426-58-1	9CLPF3ONSA	0.033	U	µg/kg	0.033	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	919005-14-4	ADONA	0.036	U	µg/kg	0.036	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	13252-13-6	HFPODA	0.038	U	µg/kg	0.038	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	4151-50-2	NETFOSA	0.044	U	µg/kg	0.044	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	2991-50-6	NETFOSAA	0.045	U	µg/kg	0.045	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	1691-99-2	NETFOSE	0.026	U	µg/kg	0.026	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	151772-58-6	NFDHA	0.037	U	µg/kg	0.037	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	31506-32-8	NMEFOSA	0.046	U	µg/kg	0.046	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	2355-31-9	NMEFOSAA	0.021	U	µg/kg	0.021	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	24448-09-7	NMEFOSE	0.044	U	µg/kg	0.044	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.036	U	µg/kg	0.036	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.043	U	µg/kg	0.043	0.28
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.049	U	µg/kg	0.049	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.045	U	µg/kg	0.045	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.028	U	µg/kg	0.028	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.046	U	µg/kg	0.046	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.036	U	µg/kg	0.036	0.19

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.027	U	µg/kg	0.027	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.029	U	µg/kg	0.029	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.036	U	µg/kg	0.036	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.062	U	µg/kg	0.062	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.027	U	µg/kg	0.027	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.021	U	µg/kg	0.021	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.031	U	µg/kg	0.031	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.044	J	µg/kg	0.04	0.28
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.05	J	µg/kg	0.05	0.28
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.035	U	µg/kg	0.035	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.038	U	µg/kg	0.038	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.035	U	µg/kg	0.035	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.02	U	µg/kg	0.02	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.039	U	µg/kg	0.039	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	113507-82-7	PFEESA	0.03	U	µg/kg	0.03	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	863090-89-5	PFMBA	0.042	U	µg/kg	0.042	0.19
CABS1324	11/14/22	Soil	0	2	N	CABS1324S001	E537M	377-73-1	PFMPA	0.022	U	µg/kg	0.022	0.19
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	120226-60-0	102FTSA	0.035	U	µg/kg	0.035	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	763051-92-9	11CLPF30UDSA	0.028	U	µg/kg	0.028	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	356-02-5	3:3 FTCA	0.037	U	µg/kg	0.037	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	757124-72-4	42FTSA	0.047	U	µg/kg	0.047	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	914637-49-3	5:3 FTCA	0.035	U	µg/kg	0.035	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	27619-97-2	62FTSA	0.025	R	µg/kg	0.025	0.27
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	812-70-4	7:3 FTCA	0.037	UJ	µg/kg	0.037	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	39108-34-4	82FTSA	0.032	U	µg/kg	0.032	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	756426-58-1	9CLPF3ONSA	0.032	U	µg/kg	0.032	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	919005-14-4	ADONA	0.036	U	µg/kg	0.036	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	13252-13-6	HFPODA	0.037	U	µg/kg	0.037	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	4151-50-2	NETFOSA	0.043	U	µg/kg	0.043	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	2991-50-6	NETFOSAA	0.044	U	µg/kg	0.044	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	1691-99-2	NETFOSE	0.026	U	µg/kg	0.026	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	151772-58-6	NFDHA	0.037	U	µg/kg	0.037	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	31506-32-8	NMEFOSA	0.045	U	µg/kg	0.045	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	2355-31-9	NMEFOSAA	0.021	U	µg/kg	0.021	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	24448-09-7	NMEFOSE	0.043	U	µg/kg	0.043	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.035	U	µg/kg	0.035	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.042	U	µg/kg	0.042	0.27
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.048	U	µg/kg	0.048	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.044	U	µg/kg	0.044	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.027	U	µg/kg	0.027	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.045	U	µg/kg	0.045	0.18

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.035	U	µg/kg	0.035	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.027	U	µg/kg	0.027	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.028	U	µg/kg	0.028	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.035	U	µg/kg	0.035	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.06	U	µg/kg	0.06	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.027	U	µg/kg	0.027	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.02	U	µg/kg	0.02	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.03	U	µg/kg	0.03	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.039	U	µg/kg	0.039	0.27
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.048	U	µg/kg	0.048	0.27
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.034	U	µg/kg	0.034	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.037	U	µg/kg	0.037	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.034	U	µg/kg	0.034	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.019	U	µg/kg	0.019	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.038	U	µg/kg	0.038	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	113507-82-7	PFEESA	0.029	U	µg/kg	0.029	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	863090-89-5	PFMBA	0.041	U	µg/kg	0.041	0.18
CABS1324	11/14/22	Soil	6	8	N	CABS1324S002	E537M	377-73-1	PFMPA	0.022	U	µg/kg	0.022	0.18
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	120226-60-0	102FTSA	0.037	U	µg/kg	0.037	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	763051-92-9	11CLPF3OUDSA	0.03	UJ	µg/kg	0.03	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	356-02-5	3:3 FTCA	0.04	U	µg/kg	0.04	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	757124-72-4	42FTSA	0.049	U	µg/kg	0.049	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	914637-49-3	5:3 FTCA	0.037	U	µg/kg	0.037	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	27619-97-2	62FTSA	0.026	R	µg/kg	0.026	0.29
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	812-70-4	7:3 FTCA	0.04	UJ	µg/kg	0.04	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	39108-34-4	82FTSA	0.034	U	µg/kg	0.034	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	756426-58-1	9CLPF3ONSA	0.034	UJ	µg/kg	0.034	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	919005-14-4	ADONA	0.038	U	µg/kg	0.038	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	13252-13-6	HFPODA	0.04	U	µg/kg	0.04	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	4151-50-2	NETFOSA	0.045	U	µg/kg	0.045	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	2991-50-6	NETFOSAA	0.046	U	µg/kg	0.046	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	1691-99-2	NETFOSE	0.027	UJ	µg/kg	0.027	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	151772-58-6	NFDHA	0.039	U	µg/kg	0.039	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	31506-32-8	NMEFOSA	0.047	U	µg/kg	0.047	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	2355-31-9	NMEFOSAA	0.022	U	µg/kg	0.022	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	24448-09-7	NMEFOSE	0.045	UJ	µg/kg	0.045	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.037	U	µg/kg	0.037	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.044	U	µg/kg	0.044	0.29
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.05	U	µg/kg	0.05	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.046	U	µg/kg	0.046	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.029	U	µg/kg	0.029	0.19

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.047	U	µg/kg	0.047	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.037	U	µg/kg	0.037	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.028	U	µg/kg	0.028	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.032	J	µg/kg	0.03	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.037	UJ	µg/kg	0.037	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.064	UJ	µg/kg	0.064	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.028	U	µg/kg	0.028	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.021	U	µg/kg	0.021	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.032	U	µg/kg	0.032	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.042	U	µg/kg	0.042	0.29
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.051	U	µg/kg	0.051	0.29
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.036	U	µg/kg	0.036	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.04	U	µg/kg	0.04	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.036	UJ	µg/kg	0.036	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.02	U	µg/kg	0.02	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.041	U	µg/kg	0.041	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	113507-82-7	PFEESA	0.031	U	µg/kg	0.031	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	863090-89-5	PFMBA	0.044	U	µg/kg	0.044	0.19
CABS1325	11/14/22	Soil	0	2	N	CABS1325S001	E537M	377-73-1	PFMPA	0.023	U	µg/kg	0.023	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	120226-60-0	102FTSA	0.037	U	µg/kg	0.037	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	763051-92-9	11CLPF3OUDSA	0.03	UJ	µg/kg	0.03	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	356-02-5	3:3 FTCA	0.039	U	µg/kg	0.039	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	757124-72-4	42FTSA	0.049	U	µg/kg	0.049	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	914637-49-3	5:3 FTCA	0.037	U	µg/kg	0.037	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	27619-97-2	62FTSA	0.026	UJ	µg/kg	0.026	0.29
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	812-70-4	7:3 FTCA	0.039	UJ	µg/kg	0.039	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	39108-34-4	82FTSA	0.034	U	µg/kg	0.034	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	756426-58-1	9CLPF3ONSA	0.034	UJ	µg/kg	0.034	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	919005-14-4	ADONA	0.038	U	µg/kg	0.038	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	13252-13-6	HFPODA	0.039	U	µg/kg	0.039	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	4151-50-2	NETFOSA	0.045	U	µg/kg	0.045	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	2991-50-6	NETFOSAA	0.046	U	µg/kg	0.046	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	1691-99-2	NETFOSE	0.027	U	µg/kg	0.027	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	151772-58-6	NFDHA	0.039	U	µg/kg	0.039	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	31506-32-8	NMEFOSA	0.047	U	µg/kg	0.047	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	2355-31-9	NMEFOSAA	0.022	U	µg/kg	0.022	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	24448-09-7	NMEFOSE	0.045	U	µg/kg	0.045	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.037	U	µg/kg	0.037	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.044	U	µg/kg	0.044	0.29
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.05	U	µg/kg	0.05	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.046	U	µg/kg	0.046	0.19

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.029	U	µg/kg	0.029	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.047	U	µg/kg	0.047	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.037	U	µg/kg	0.037	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.028	U	µg/kg	0.028	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.03	U	µg/kg	0.03	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.037	UJ	µg/kg	0.037	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.064	UJ	µg/kg	0.064	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.028	U	µg/kg	0.028	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.021	U	µg/kg	0.021	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.032	U	µg/kg	0.032	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.041	U	µg/kg	0.041	0.29
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.051	U	µg/kg	0.051	0.29
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.036	U	µg/kg	0.036	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.039	U	µg/kg	0.039	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.036	U	µg/kg	0.036	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.02	U	µg/kg	0.02	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.04	U	µg/kg	0.04	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	113507-82-7	PFEEESA	0.031	U	µg/kg	0.031	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	863090-89-5	PFMBA	0.043	U	µg/kg	0.043	0.19
CABS1325	11/14/22	Soil	6	8	N	CABS1325S002	E537M	377-73-1	PFMPA	0.023	U	µg/kg	0.023	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	120226-60-0	102FTSA	0.037	U	µg/kg	0.037	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	763051-92-9	11CLPF3OUDSA	0.03	U	µg/kg	0.03	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	356-02-5	3:3 FTCA	0.04	UJ	µg/kg	0.04	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	757124-72-4	42FTSA	0.049	U	µg/kg	0.049	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	914637-49-3	5:3 FTCA	0.037	U	µg/kg	0.037	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	27619-97-2	62FTSA	0.026	U	µg/kg	0.026	0.29
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	812-70-4	7:3 FTCA	0.04	U	µg/kg	0.04	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	39108-34-4	82FTSA	0.034	U	µg/kg	0.034	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	756426-58-1	9CLPF3ONSA	0.034	U	µg/kg	0.034	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	919005-14-4	ADONA	0.038	U	µg/kg	0.038	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	13252-13-6	HFPODA	0.04	U	µg/kg	0.04	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	4151-50-2	NETFOSA	0.045	U	µg/kg	0.045	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	2991-50-6	NETFOSAA	0.046	U	µg/kg	0.046	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	1691-99-2	NETFOSE	0.027	U	µg/kg	0.027	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	151772-58-6	NFDHA	0.039	U	µg/kg	0.039	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	31506-32-8	NMEFOSA	0.047	U	µg/kg	0.047	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	2355-31-9	NMEFOSAA	0.022	U	µg/kg	0.022	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	24448-09-7	NMEFOSE	0.045	U	µg/kg	0.045	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.037	U	µg/kg	0.037	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.044	U	µg/kg	0.044	0.29
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.05	U	µg/kg	0.05	0.19

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.046	U	µg/kg	0.046	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.029	U	µg/kg	0.029	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.047	U	µg/kg	0.047	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.037	U	µg/kg	0.037	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.028	U	µg/kg	0.028	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.03	U	µg/kg	0.03	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.037	U	µg/kg	0.037	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.064	U	µg/kg	0.064	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.028	U	µg/kg	0.028	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.021	U	µg/kg	0.021	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.032	U	µg/kg	0.032	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.042	U	µg/kg	0.042	0.29
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.054	J	µg/kg	0.051	0.29
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.036	U	µg/kg	0.036	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.04	U	µg/kg	0.04	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.036	U	µg/kg	0.036	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	72629-94-8	Perfluorotridecanoic acid (PFTTrDA)	0.02	U	µg/kg	0.02	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.041	U	µg/kg	0.041	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	113507-82-7	PFEESA	0.031	U	µg/kg	0.031	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	863090-89-5	PFMBA	0.044	U	µg/kg	0.044	0.19
DABS1284	11/11/22	Soil	0	1.1	N	DABS1284S001	E537M	377-73-1	PFMPA	0.023	U	µg/kg	0.023	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	120226-60-0	102FTSA	0.037	U	µg/kg	0.037	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	120226-60-0	102FTSA	0.036	U	µg/kg	0.036	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	763051-92-9	11CLPF3OUDSA	0.03	U	µg/kg	0.03	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	763051-92-9	11CLPF3OUDSA	0.03	U	µg/kg	0.03	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	356-02-5	3:3 FTCA	0.04	UJ	µg/kg	0.04	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	356-02-5	3:3 FTCA	0.039	UJ	µg/kg	0.039	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	757124-72-4	42FTSA	0.05	U	µg/kg	0.05	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	757124-72-4	42FTSA	0.049	U	µg/kg	0.049	0.19
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	914637-49-3	5:3 FTCA	0.036	U	µg/kg	0.036	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	914637-49-3	5:3 FTCA	0.037	U	µg/kg	0.037	0.2
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	27619-97-2	62FTSA	0.026	UJ	µg/kg	0.026	0.29
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	27619-97-2	62FTSA	0.026	UJ	µg/kg	0.026	0.29
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	812-70-4	7:3 FTCA	0.13	J	µg/kg	0.04	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	812-70-4	7:3 FTCA	0.11	J	µg/kg	0.039	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	39108-34-4	82FTSA	0.034	U	µg/kg	0.034	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	39108-34-4	82FTSA	0.034	U	µg/kg	0.034	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	756426-58-1	9CLPF3ONSA	0.034	U	µg/kg	0.034	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	756426-58-1	9CLPF3ONSA	0.034	U	µg/kg	0.034	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	919005-14-4	ADONA	0.038	U	µg/kg	0.038	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	919005-14-4	ADONA	0.037	U	µg/kg	0.037	0.19

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	13252-13-6	HFPODA	0.039	U	µg/kg	0.039	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	13252-13-6	HFPODA	0.04	U	µg/kg	0.04	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	4151-50-2	NETFOSA	0.045	U	µg/kg	0.045	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	4151-50-2	NETFOSA	0.046	U	µg/kg	0.046	0.2
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	2991-50-6	NETFOSAA	0.18	J	µg/kg	0.047	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	2991-50-6	NETFOSAA	0.12	J	µg/kg	0.046	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	1691-99-2	NETFOSE	0.027	U	µg/kg	0.027	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	1691-99-2	NETFOSE	0.027	U	µg/kg	0.027	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	151772-58-6	NFDHA	0.039	U	µg/kg	0.039	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	151772-58-6	NFDHA	0.038	U	µg/kg	0.038	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	31506-32-8	NMEFOSA	0.048	U	µg/kg	0.048	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	31506-32-8	NMEFOSA	0.047	U	µg/kg	0.047	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	2355-31-9	NMEFOSAA	0.023	U	µg/kg	0.023	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	2355-31-9	NMEFOSAA	0.022	U	µg/kg	0.022	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	24448-09-7	NMEFOSE	0.046	U	µg/kg	0.046	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	24448-09-7	NMEFOSE	0.045	U	µg/kg	0.045	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.037	U	µg/kg	0.037	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.036	U	µg/kg	0.036	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.063	J	µg/kg	0.045	0.29
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.059	J	µg/kg	0.044	0.29
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.087	J	µg/kg	0.051	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.091	J	µg/kg	0.05	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.052	J	µg/kg	0.047	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.057	J	µg/kg	0.046	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.17	J	µg/kg	0.029	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.17	J	µg/kg	0.029	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.048	U	µg/kg	0.048	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.047	U	µg/kg	0.047	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.037	U	µg/kg	0.037	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.036	U	µg/kg	0.036	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.028	U	µg/kg	0.028	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.028	U	µg/kg	0.028	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.035	J	µg/kg	0.03	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.03	U	µg/kg	0.03	0.19
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.036	U	µg/kg	0.036	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.037	U	µg/kg	0.037	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.063	U	µg/kg	0.063	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.065	U	µg/kg	0.065	0.2
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.028	U	µg/kg	0.028	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.028	U	µg/kg	0.028	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.022	U	µg/kg	0.022	0.2

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.021	U	µg/kg	0.021	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.04	J	µg/kg	0.032	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.04	J	µg/kg	0.032	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.17	J	µg/kg	0.042	0.29
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.19	J	µg/kg	0.041	0.29
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.4		µg/kg	0.052	0.29
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.35		µg/kg	0.051	0.29
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.036	U	µg/kg	0.036	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.035	U	µg/kg	0.035	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.04	U	µg/kg	0.04	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.039	U	µg/kg	0.039	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.066	J	µg/kg	0.036	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.059	J	µg/kg	0.035	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.061	J	µg/kg	0.021	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.061	J	µg/kg	0.02	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.067	U	µg/kg	0.041	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.061	J	µg/kg	0.04	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	113507-82-7	PFEESA	0.031	U	µg/kg	0.031	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	113507-82-7	PFEESA	0.031	U	µg/kg	0.031	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	863090-89-5	PFMBA	0.044	UJ	µg/kg	0.044	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	863090-89-5	PFMBA	0.043	U	µg/kg	0.043	0.19
EVBS2000	11/17/22	Soil	0	2	N	EVBS2000S001	E537M	377-73-1	PFMPA	0.023	U	µg/kg	0.023	0.2
EVBS2000	11/17/22	Soil	0	2	FD	EVBS2000D001	E537M	377-73-1	PFMPA	0.023	U	µg/kg	0.023	0.19
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	120226-60-0	102FTSA	0.034	U	µg/kg	0.034	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	763051-92-9	11CLPF3OUDSA	0.028	U	µg/kg	0.028	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	356-02-5	3:3 FTCA	0.037	UJ	µg/kg	0.037	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	757124-72-4	42FTSA	0.046	U	µg/kg	0.046	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	914637-49-3	5:3 FTCA	0.034	U	µg/kg	0.034	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	27619-97-2	62FTSA	0.024	UJ	µg/kg	0.024	0.27
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	812-70-4	7:3 FTCA	0.037	UJ	µg/kg	0.037	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	39108-34-4	82FTSA	0.031	U	µg/kg	0.031	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	756426-58-1	9CLPF3ONSA	0.031	U	µg/kg	0.031	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	919005-14-4	ADONA	0.035	U	µg/kg	0.035	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	13252-13-6	HFPODA	0.037	U	µg/kg	0.037	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	4151-50-2	NETFOSA	0.042	U	µg/kg	0.042	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	2991-50-6	NETFOSAA	0.043	U	µg/kg	0.043	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	1691-99-2	NETFOSE	0.025	U	µg/kg	0.025	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	151772-58-6	NFDHA	0.036	U	µg/kg	0.036	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	31506-32-8	NMEFOSA	0.044	U	µg/kg	0.044	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	2355-31-9	NMEFOSAA	0.021	U	µg/kg	0.021	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	24448-09-7	NMEFOSE	0.042	U	µg/kg	0.042	0.18

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.034	U	µg/kg	0.034	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.09	J	µg/kg	0.041	0.27
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.047	U	µg/kg	0.047	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.12	J	µg/kg	0.043	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.036	J	µg/kg	0.027	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.044	U	µg/kg	0.044	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.039	J	µg/kg	0.034	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.026	U	µg/kg	0.026	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.028	U	µg/kg	0.028	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.034	U	µg/kg	0.034	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.059	U	µg/kg	0.059	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.026	U	µg/kg	0.026	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.062	J	µg/kg	0.02	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.03	U	µg/kg	0.03	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.34		µg/kg	0.039	0.27
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.38		µg/kg	0.048	0.27
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.033	U	µg/kg	0.033	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.037	U	µg/kg	0.037	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.033	U	µg/kg	0.033	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.019	U	µg/kg	0.019	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.038	U	µg/kg	0.038	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	113507-82-7	PFEESA	0.029	U	µg/kg	0.029	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	863090-89-5	PFMBA	0.04	UJ	µg/kg	0.04	0.18
EVBS2001	11/17/22	Soil	0	1.6	N	EVBS2001S001	E537M	377-73-1	PFMPA	0.022	U	µg/kg	0.022	0.18
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	120226-60-0	102FTSA	0.036	U	µg/kg	0.036	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	763051-92-9	11CLPF3OUDSA	0.03	UJ	µg/kg	0.03	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	356-02-5	3:3 FTCA	0.039	UJ	µg/kg	0.039	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	757124-72-4	42FTSA	0.049	U	µg/kg	0.049	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	914637-49-3	5:3 FTCA	0.045	J	µg/kg	0.036	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	27619-97-2	62FTSA	0.026	UJ	µg/kg	0.026	0.29
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	812-70-4	7:3 FTCA	0.07	J	µg/kg	0.039	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	39108-34-4	82FTSA	0.033	U	µg/kg	0.033	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	756426-58-1	9CLPF3ONSA	0.033	UJ	µg/kg	0.033	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	919005-14-4	ADONA	0.037	U	µg/kg	0.037	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	13252-13-6	HFPODA	0.039	U	µg/kg	0.039	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	4151-50-2	NETFOSA	0.045	U	µg/kg	0.045	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	2991-50-6	NETFOSAA	0.046	U	µg/kg	0.046	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	1691-99-2	NETFOSE	0.027	U	µg/kg	0.027	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	151772-58-6	NFDHA	0.038	U	µg/kg	0.038	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	31506-32-8	NMEFOSA	0.047	U	µg/kg	0.047	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	2355-31-9	NMEFOSAA	0.044	J	µg/kg	0.022	0.19

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	24448-09-7	NMEFOSE	0.066	J	µg/kg	0.045	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.036	U	µg/kg	0.036	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.095	J	µg/kg	0.044	0.29
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.05	U	µg/kg	0.05	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.31		µg/kg	0.046	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.14	J	µg/kg	0.029	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.047	U	µg/kg	0.047	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.036	U	µg/kg	0.036	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.028	U	µg/kg	0.028	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.03	U	µg/kg	0.03	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.043	J	µg/kg	0.036	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.063	U	µg/kg	0.063	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.028	U	µg/kg	0.028	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.098	J	µg/kg	0.021	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.031	U	µg/kg	0.031	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.51		µg/kg	0.041	0.29
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.22	J	µg/kg	0.05	0.29
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.035	U	µg/kg	0.035	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.039	U	µg/kg	0.039	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.08	J	µg/kg	0.035	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	72629-94-8	Perfluorotridecanoic acid (PFTTrDA)	0.068	J	µg/kg	0.02	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.1	J	µg/kg	0.04	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	113507-82-7	PFEEESA	0.03	U	µg/kg	0.03	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	863090-89-5	PFMBA	0.043	UJ	µg/kg	0.043	0.19
EVBS2002	11/17/22	Soil	0	0.75	N	EVBS2002S001	E537M	377-73-1	PFMPA	0.023	U	µg/kg	0.023	0.19
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	120226-60-0	102FTSA	0.21		µg/kg	0.038	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	763051-92-9	11CLPF3OUDSA	0.031	U	µg/kg	0.031	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	356-02-5	3:3 FTCA	0.041	UJ	µg/kg	0.041	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	757124-72-4	42FTSA	0.05	U	µg/kg	0.05	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	914637-49-3	5:3 FTCA	0.52		µg/kg	0.038	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	27619-97-2	62FTSA	0.056	J	µg/kg	0.027	0.3
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	812-70-4	7:3 FTCA	0.38	J	µg/kg	0.041	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	39108-34-4	82FTSA	0.21		µg/kg	0.035	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	756426-58-1	9CLPF3ONSA	0.035	U	µg/kg	0.035	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	919005-14-4	ADONA	0.039	U	µg/kg	0.039	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	13252-13-6	HFPODA	0.041	U	µg/kg	0.041	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	4151-50-2	NETFOSA	0.047	U	µg/kg	0.047	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	2991-50-6	NETFOSAA	0.048	U	µg/kg	0.048	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	1691-99-2	NETFOSE	0.028	U	µg/kg	0.028	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	151772-58-6	NFDHA	0.04	U	µg/kg	0.04	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	31506-32-8	NMEFOSA	0.049	U	µg/kg	0.049	0.2

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	2355-31-9	NMEFOSAA	0.023	U	µg/kg	0.023	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	24448-09-7	NMEFOSE	0.047	U	µg/kg	0.047	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.038	U	µg/kg	0.038	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.47	U	µg/kg	0.046	0.3
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.051	U	µg/kg	0.051	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.15	J	µg/kg	0.048	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.03	U	µg/kg	0.03	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.049	U	µg/kg	0.049	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.74		µg/kg	0.038	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.029	U	µg/kg	0.029	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	1.7		µg/kg	0.031	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.038	U	µg/kg	0.038	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.065	U	µg/kg	0.065	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.029	U	µg/kg	0.029	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.12	J	µg/kg	0.022	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.033	U	µg/kg	0.033	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.058	J	µg/kg	0.043	0.3
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.71		µg/kg	0.052	0.3
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.037	U	µg/kg	0.037	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	1.9		µg/kg	0.041	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.037	U	µg/kg	0.037	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	72629-94-8	Perfluorotridecanoic acid (PFTTrDA)	0.021	U	µg/kg	0.021	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.042	U	µg/kg	0.042	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	113507-82-7	PFEESA	0.032	U	µg/kg	0.032	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	863090-89-5	PFMBA	0.045	UJ	µg/kg	0.045	0.2
EVBS2003	11/10/22	Soil	0	2	N	EVBS2003S001	E537M	377-73-1	PFMPA	0.024	U	µg/kg	0.024	0.2
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	120226-60-0	102FTSA	0.036	U	µg/kg	0.036	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	763051-92-9	11CLPF3OUDSA	0.029	U	µg/kg	0.029	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	356-02-5	3:3 FTCA	0.039	UJ	µg/kg	0.039	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	757124-72-4	42FTSA	0.048	U	µg/kg	0.048	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	914637-49-3	5:3 FTCA	0.12	U	µg/kg	0.036	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	27619-97-2	62FTSA	0.025	UJ	µg/kg	0.025	0.28
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	812-70-4	7:3 FTCA	0.11	J	µg/kg	0.039	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	39108-34-4	82FTSA	0.033	U	µg/kg	0.033	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	756426-58-1	9CLPF3ONSA	0.033	U	µg/kg	0.033	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	919005-14-4	ADONA	0.037	U	µg/kg	0.037	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	13252-13-6	HFPODA	0.039	U	µg/kg	0.039	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	4151-50-2	NETFOSA	0.044	U	µg/kg	0.044	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	2991-50-6	NETFOSAA	0.045	U	µg/kg	0.045	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	1691-99-2	NETFOSE	0.026	U	µg/kg	0.026	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	151772-58-6	NFDHA	0.038	U	µg/kg	0.038	0.19

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	31506-32-8	NMEFOSA	0.046	U	µg/kg	0.046	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	2355-31-9	NMEFOSAA	0.022	U	µg/kg	0.022	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	24448-09-7	NMEFOSE	0.044	U	µg/kg	0.044	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.036	U	µg/kg	0.036	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.17	U	µg/kg	0.043	0.28
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.049	U	µg/kg	0.049	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.045	U	µg/kg	0.045	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.028	U	µg/kg	0.028	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.046	U	µg/kg	0.046	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.05	J	µg/kg	0.036	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.027	U	µg/kg	0.027	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.04	J	µg/kg	0.029	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.036	U	µg/kg	0.036	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.062	U	µg/kg	0.062	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.027	U	µg/kg	0.027	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.06	J	µg/kg	0.021	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.031	U	µg/kg	0.031	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.29		µg/kg	0.041	0.28
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.41		µg/kg	0.05	0.28
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.035	U	µg/kg	0.035	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.039	J	µg/kg	0.039	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.035	U	µg/kg	0.035	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.02	U	µg/kg	0.02	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.04	U	µg/kg	0.04	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	113507-82-7	PFEESA	0.03	U	µg/kg	0.03	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	863090-89-5	PFMBA	0.042	UJ	µg/kg	0.042	0.19
EVBS2004	11/10/22	Soil	0	2	N	EVBS2004S001	E537M	377-73-1	PFMPA	0.023	U	µg/kg	0.023	0.19
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	120226-60-0	102FTSA	0.038	U	µg/kg	0.038	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	763051-92-9	11CLPF3OUDSA	0.031	U	µg/kg	0.031	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	356-02-5	3:3 FTCA	0.041	UJ	µg/kg	0.041	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	757124-72-4	42FTSA	0.051	U	µg/kg	0.051	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	914637-49-3	5:3 FTCA	0.038	U	µg/kg	0.038	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	27619-97-2	62FTSA	0.027	R	µg/kg	0.027	0.3
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	812-70-4	7:3 FTCA	0.041	R	µg/kg	0.041	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	39108-34-4	82FTSA	0.035	U	µg/kg	0.035	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	756426-58-1	9CLPF3ONSA	0.035	U	µg/kg	0.035	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	919005-14-4	ADONA	0.039	U	µg/kg	0.039	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	13252-13-6	HFPODA	0.041	U	µg/kg	0.041	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	4151-50-2	NETFOSA	0.047	U	µg/kg	0.047	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	2991-50-6	NETFOSAA	0.048	U	µg/kg	0.048	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	1691-99-2	NETFOSE	0.028	U	µg/kg	0.028	0.2

Table 3-5. NASA SSFL PFAS Soil Data Results (Flat File)

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Location Name	Sample Date	Sample Matrix	Sample Beginning Depth (feet bgs)	Sample Ending Depth (feet bgs)	Sample Type Code	Sample Name	Analytical Method	CAS Number	Analyte Name	Result Value	Result Flag	Result Units	MDL	RL
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	151772-58-6	NFDHA	0.04	U	µg/kg	0.04	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	31506-32-8	NMEFOSA	0.049	U	µg/kg	0.049	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	2355-31-9	NMEFOSAA	0.023	U	µg/kg	0.023	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	24448-09-7	NMEFOSE	0.047	U	µg/kg	0.047	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.038	U	µg/kg	0.038	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	375-22-4	Perfluorobutanoic acid (PFBA)	0.17	U	µg/kg	0.046	0.3
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.052	U	µg/kg	0.052	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	335-76-2	Perfluorodecanoic acid (PFDA)	0.048	U	µg/kg	0.048	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	307-55-1	Perfluorododecanoic acid (PFDoA)	0.03	U	µg/kg	0.03	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	375-92-8	Perfluoroheptanesulfonic acid (PFHpS)	0.049	U	µg/kg	0.049	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	375-85-9	Perfluoroheptanoic acid (PFHpA)	0.088	J	µg/kg	0.038	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.032	J	µg/kg	0.029	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	307-24-4	Perfluorohexanoic acid (PFHxA)	0.045	J	µg/kg	0.031	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	67905-19-5	Perfluoro-n-hexadecanoic acid (PFHxDA)	0.038	U	µg/kg	0.038	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	16517-11-6	Perfluoro-n-octadecanoic acid (PFODA)	0.065	U	µg/kg	0.065	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	68259-12-1	Perfluorononanesulfonic acid (PFNS)	0.029	U	µg/kg	0.029	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	375-95-1	Perfluorononanoic acid (PFNA)	0.035	J	µg/kg	0.022	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	754-91-6	Perfluorooctanesulfonamide (FOSA)	0.033	U	µg/kg	0.033	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.32		µg/kg	0.043	0.3
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	335-67-1	Perfluorooctanoic acid (PFOA)	0.33		µg/kg	0.053	0.3
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	2706-91-4	Perfluoropentanesulfonic acid (PFPeS)	0.037	U	µg/kg	0.037	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	2706-90-3	Perfluoropentanoic acid (PFPeA)	0.046	J	µg/kg	0.041	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.037	U	µg/kg	0.037	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	72629-94-8	Perfluorotridecanoic acid (PFTrDA)	0.021	U	µg/kg	0.021	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.042	U	µg/kg	0.042	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	113507-82-7	PFEESA	0.032	U	µg/kg	0.032	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	863090-89-5	PFMBA	0.045	U	µg/kg	0.045	0.2
EVBS2004	11/10/22	Soil	2.5	4.5	N	EVBS2004S002	E537M	377-73-1	PFMPA	0.024	U	µg/kg	0.024	0.2

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

S = screening-level sample due to sampling method (for example, parameter stabilization not achieved or limited purge performed because of well yield).

R = The sample results are rejected because of serious deficiencies in the ability to analyze the sample and to meet the quality control criteria. The presence or absence of the analyte cannot be verified.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was below the reported sample quantitation limit. However, the reported value is approximate.

µg/kg = microgram(s) per kilogram

CAS = Chemical Abstracts Service

bgs = below ground surface

FD = field duplicate sample

MDL = method detection limit

N = normal samples

RL = reporting limit

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Table 4-1. Groundwater Analytical Results
Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

PFAS Analyte	Screening Level ^[a]	Units	Area II Landfill ^[b]	Area II Landfill ^[b]	Area II Landfill ^[b]	Area II Landfill ^[b]	Area II Landfill ^[b]	Area II Landfill ^[b]	Delta Test Stands/ Delta Skim Pond ^[b]	Delta Test Stands/ Delta Skim Pond	Building 2207 ^[b]	Building 2207 ^[b]
			ND-126 CFGW ND126GWS013 20 to 205 5/23/2022	RD-81-1 CFGW RD81GW01S016 114 to 129 5/24/2022	RD-82 CFGW RD82GW01S005 20 to 197 5/25/2022	RD-82 CFGW RD82GW01D005 20 to 197 5/25/2022	RD-83 CFGW RD83GW01S012 20 to 143 7/29/2022	RD-83 CFGW RD83GW01D012 20 to 143 7/29/2022	HAR-27 NSGW HAR27GWS014 21 to 40 6/1/2022	HAR-28 NSGW HAR28GW01S021 20 to 40 5/31/2022	RD-26 CFGW RD26GWS005 30 to 160 6/7/2022	RD-26 CFGW RD26GWS006 30 to 160 7/28/2022
HFPO-DA	0.006	µg/L	0.00056 U	0.0006 U	0.00059 U	0.00059 U	0.00064 U	0.00063 U	0.00056 U	0.00054 U	0.00061 U	0.00063 U
Perfluorobutanesulfonic acid (PFBS)	0.6	µg/L	0.00044 U	0.00085 [^] J	0.00029 U	0.00029 U	0.00031 U	0.00031 U	0.0023 [^]	0.00076 [^] J	0.0036 [^]	0.0033 [^]
Perfluorohexanesulfonic acid (PFHxS)	0.039	µg/L	0.00048 U	0.00034 U	0.00033 U	0.00033 U	0.00035 U	0.00035 U	0.00094 [^] J	0.00064 [^] J	0.011 [^]	0.01 [^]
Perfluorononanoic acid (PFNA)	0.006	µg/L	0.00045 U	0.00091 [^] J	0.00048 U	0.00048 U	0.00052 U	0.00051 U	0.00045 U	0.00044 U	0.0016 [^] J	0.00094 [^] J
Perfluorooctanesulfonic acid (PFOS)	0.004	µg/L	0.00047 U	0.0005 U	0.0005 U	0.0005 U	0.00054 U	0.00053 U	0.0023 [^]	0.0015 [^] J	0.0061 [^] †	0.0042 [^] †
Perfluorooctanoic acid (PFOA)	0.006	µg/L	0.0054 [^]	0.0068 [^] †	0.00048 U	0.00048 U	0.00052 U	0.00051 U	0.018 [^] †	0.00087 [^] J	0.014 [^] †	0.012 [^] †

PFAS Analyte	Screening Level ^[a]	Units	Coca Test Stands and Coca Skim Pond ^[b]	Coca Test Stands and Coca Skim Pond ^[b]	Coca Test Stands and Coca Skim Pond ^[b]	Coca Test Stands and Coca Skim Pond ^[b]	Coca Test Stands and Coca Skim Pond ^[b]	Alfa Test Stands, Alfa Retention Pond, and Alfa Skim Pond ^[b]	Alfa Test Stands, Alfa Retention Pond, and Alfa Skim Pond ^[b]	Alfa Test Stands, Alfa Retention Pond, and Alfa Skim Pond ^[b]	Alfa Test Stands, Alfa Retention Pond, and Alfa Skim Pond ^[b]	Alfa Test Stands, Alfa Retention Pond, and Alfa Skim Pond ^[b]
			ND-113-1 CFGW ND113GW01S014 197 to 212 5/26/2022	PZ-017A NSGW PZ017AGWS003 7 to 17 5/26/2022	PZ-045 NSGW PZ045GWS002 0 to 0 5/27/2022	PZ-048 NSGW PZ048GWS004 9 to 19 5/25/2022	RD-79 CFGW RD79GWS011 10 to 55 5/25/2022	HAR-11 NSGW HAR11GW01S022 11.2 to 31 6/6/2022	HAR-20 CFGW HAR20GW01S023 30 to 230 6/2/2022	PZ-154 NSGW PZ154GWS004 50 to 60 6/1/2022	RD-49A NSGW RD49AGW01S012 18.5 to 50 6/1/2022	RD-49B CFGW RD49BGW01S012 250 to 298 6/2/2022
HFPO-DA	0.006	µg/L	0.00057 U	0.00056 U	0.00058 U	0.00059 U	0.00063 U	0.00062 U	0.00061 U	0.00062 U	0.00057 U	0.0006 U
Perfluorobutanesulfonic acid (PFBS)	0.6	µg/L	0.0017 [^]	0.0054 [^]	0.0033 [^]	0.0057 [^]	0.01 [^]	0.0021 [^]	0.00094 U	0.0011 [^] J	0.0019 [^]	0.0021 [^]
Perfluorohexanesulfonic acid (PFHxS)	0.039	µg/L	0.0011 [^] J	0.0019 [^]	0.0017 [^]	0.0033 [^]	0.0026 [^]	0.0017 [^] J	0.00058 [^] J	0.00047 [^] J	0.00095 [^] J	0.00049 [^] J
Perfluorononanoic acid (PFNA)	0.006	µg/L	0.0027 [^]	0.0089 [^] †	0.0029 [^]	0.0015 [^] J	0.017 [^] †	0.00051 [^] J	0.00049 U	0.00075 [^] J	0.023 [^] †	0.00057 [^] J
Perfluorooctanesulfonic acid (PFOS)	0.004	µg/L	0.0038 [^]	0.0056 [^] †	0.01 [^] †	0.0051 [^] †	0.014 [^] †	0.00052 U	0.0009 [^] J	0.0058 U	0.00048 U	0.002 [^]
Perfluorooctanoic acid (PFOA)	0.006	µg/L	0.021 [^] †	0.039 [^] †	0.024 [^] †	0.055 [^] †	0.071 [^] †	0.12 [^] †	0.05 [^] †	0.07 [^] †	0.096 [^] †	0.017 [^] †

PFAS Analyte	Screening Level ^[a]	Units	Bravo Test Stands, Alfa-Bravo Skim Pond, and Bravo Skim Pond ^[b]	Bravo Test Stands, Alfa-Bravo Skim Pond, and Bravo Skim Pond ^[b]	Bravo Test Stands, Alfa-Bravo Skim Pond, and Bravo Skim Pond ^[b]	Bravo Test Stands, Alfa-Bravo Skim Pond, and Bravo Skim Pond ^[b]	Bravo Test Stands, Alfa-Bravo Skim Pond, and Bravo Skim Pond ^[b]	Building 2206 ^[b]	Building 2206 ^[b]	Building 2206 ^[b]
			HAR-09 NSGW HAR09GW01S020 16.1 to 30.5 6/6/2022	HAR-19 CFGW HAR19GW01S030 30 to 220 5/27/2022	HAR-21 CFGW HAR21GW01S019 30 to 130 6/6/2022	ND-134-1 CFGW ND134GW01S014 275.5 to 291.5 5/27/2022	ND-135-1 CFGW ND135GW01S024 198 to 213 5/31/2022	PZ-140 NSGW PZ140GWS009 52 to 62 6/3/2022	PZ-140 NSGW PZ140GWD009 52 to 62 6/3/2022	ND-125-1 CFGW ND125GW01S014 190 to 205 6/3/2022
HFPO-DA	0.006	µg/L	0.00062 U	0.00054 U	0.0035 U	0.00057 U	0.00055 U	0.00062 U	0.00061 U	0.00062 SU
Perfluorobutanesulfonic acid (PFBS)	0.6	µg/L	0.005 [^]	0.0022 U	0.0035 [^] J	0.00028 U	0.00027 U	0.0074 [^]	0.0063 [^]	0.0028 [^] S
Perfluorohexanesulfonic acid (PFHxS)	0.039	µg/L	0.0014 [^] J	0.002 [^]	0.0019 U	0.00031 U	0.00068 [^] J	0.0027 [^]	0.0031 [^]	0.0024 [^] S
Perfluorononanoic acid (PFNA)	0.006	µg/L	0.0005 U	0.00044 U	0.0028 U	0.00046 U	0.00044 U	0.0019 [^]	0.002 [^]	0.006 [^] S
Perfluorooctanesulfonic acid (PFOS)	0.004	µg/L	0.00052 U	0.0044 [^] †	0.0029 U	0.00048 U	0.00046 U	0.01 [^] †	0.011 [^] †	0.014 [^] † S
Perfluorooctanoic acid (PFOA)	0.006	µg/L	0.067 [^] †	0.51 [^] †	0.057 [^] †	0.00046 U	0.19 [^] †	2.9 [^] †	3 [^] †	1.2 [^] † S

^[a] U.S. Environmental Protection Agency 2022 Regional Screening Level for PFAS

^[b] Information identified is location ID, groundwater formation, sample ID, sample depth (feet), and sample date.

J = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.

S = The sample results are unvalidated and should be used for screening purposes only.

SU = The sample results are unvalidated and should be used for screening purposes only.

U = The analyte was analyzed for but was not detected above the reported sample quantitation limit.

Bold[^] = Bold text with a ^ symbol indicates a detected analyte.

Gray† = Gray shading with a † symbol indicates a result exceeded screening criteria.

µg/L = microgram(s) per liter

CFGW = Chatsworth Formation groundwater

HFPO-DA = hexafluoropropylene oxide dimer acid

ID = identification number

NSGW = near-surface groundwater

PFAS = per- and polyfluoroalkyl substances

Table 4-2. Soil Analytical Results
 Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

PFAS Analyte	Screening Level ^[a]	Units	Area II Landfill ^[b]	Area II Landfill ^[b]	Area II Landfill ^[b]	Area II Landfill ^[b]	Building 2207 ^[b]	Building 2207 ^[b]	Building 2207 ^[b]	Area II STP ^[b]	Area II STP ^[b]	Area II STP ^[b]	Area II STP ^[b]
			A2BS1243 Hand Auger A2BS1243S001 0 to 2 11/9/2022	A2BS1243 Hand Auger A2BS1243D001 0 to 2 11/9/2022	A2BS1243 Hand Auger A2BS1243S002 6 to 8 11/9/2022	A2BS1244 Hand Auger A2BS1244S001 0 to 1.67 11/9/2022	EVBS2003 Direct Push EVBS2003S001 0 to 2 11/10/2022	EVBS2004 Direct Push EVBS2004S001 0 to 2 11/10/2022	EVBS2004 Direct Push EVBS2004S002 2.5 to 4.5 11/10/2022	APBS1245 Direct Push APBS1245S001 0 - 2 11/10/2022	APBS1245 Direct Push APBS1245S002 6 - 8 11/10/2022	APBS1246 Direct Push APBS1246S001 0 - 2 11/10/2022	APBS1246 Direct Push APBS1246S002 4 to 6 11/10/2022
HFPO-DA	23	µg/kg	0.041 U	0.04 U	0.039 U	0.038 U	0.041 U	0.039 U	0.041 U	0.038 U	0.037 U	0.039 U	0.038 U
Perfluorobutanesulfonic acid (PFBS)	1900	µg/kg	0.038 U	0.037 U	0.036 U	0.036 U	0.038 U	0.036 U	0.038 U	0.035 U	0.035 U	0.036 U	0.036 U
Perfluorohexanesulfonic acid (PFHxS)	13	µg/kg	0.029 U	0.028 U	0.028 U	0.027 U	0.029 U	0.027 U	0.032 ^J	0.027 U	0.026 U	0.028 U	0.027 U
Perfluorononanoic acid (PFNA)	19	µg/kg	0.026^J	0.022 U	0.021 U	0.028^J	0.12^J	0.06^J	0.035^J	0.02 U	0.02 U	0.046^J	0.021 U
Perfluorooctanesulfonic acid (PFOS)	13	µg/kg	0.2^J	0.15^J	0.072^J	0.62^J	0.058^J	0.29^J	0.32^J	0.17^J	0.18^J	0.21^J	0.062^J
Perfluorooctanoic acid (PFOA)	19	µg/kg	0.11^J	0.1^J	0.051 U	0.073^J	0.71^J	0.41^J	0.33^J	0.4^J	0.28^J	0.1^J	0.12^J

PFAS Analyte	Screening Level ^[a]	Units	Alfa Test Stands, Alfa Retention Pond, and Alfa Skim Pond ^[b]	Alfa Test Stands, Alfa Retention Pond, and Alfa Skim Pond ^[b]	Alfa Test Stands, Alfa Retention Pond, and Alfa Skim Pond ^[b]	Alfa Test Stands, Alfa Retention Pond, and Alfa Skim Pond ^[b]	Alfa Test Stands, Alfa Retention Pond, and Alfa Skim Pond ^[b]	Coca Test Stands and Coca Skim Pond ^[b]	Coca Test Stands and Coca Skim Pond ^[b]	Coca Test Stands and Coca Skim Pond ^[b]	Coca Test Stands and Coca Skim Pond ^[b]	Delta Test Stands/Delta Skim Pond
			AABS1262 Hand Auger AABS1262S001 0 to 2 11/11/2022	AABS1262 Hand Auger AABS1262S002 4.6 to 6.6 11/11/2022	AABS1263 Hand Auger AABS1263S001 0 to 2.1 11/11/2022	AABS1264 Hand Auger AABS1264S001 0 to 1.4 11/11/2022	AABS1265 Hand Auger AABS1265S001 0 to 1.8 11/10/2022	CABS1324 Direct Push CABS1324S001 0 to 2 11/14/2022	CABS1324 Direct Push CABS1324S002 6 to 8 11/14/2022	CABS1325 Direct Push CABS1325S001 0 to 2 11/14/2022	CABS1325 Direct Push CABS1325S002 6 to 8 11/14/2022	DABS1284 Hand Auger DABS1284S001 0 to 1.1 11/11/2022
HFPO-DA	23	µg/kg	0.039 U	0.039 U	0.04 U	0.04 U	0.041 U	0.038 U	0.037 U	0.04 U	0.039 U	0.04 U
Perfluorobutanesulfonic acid (PFBS)	1900	µg/kg	0.036 U	0.036 U	0.037 U	0.037 U	0.038 U	0.036 U	0.035 U	0.037 U	0.037 U	0.037 U
Perfluorohexanesulfonic acid (PFHxS)	13	µg/kg	0.028 U	0.028 U	0.028 U	0.028 U	0.029 U	0.027 U	0.027 U	0.028 U	0.028 U	0.028 U
Perfluorononanoic acid (PFNA)	19	µg/kg	0.023^J	0.021 U	0.037^J	0.12^J	0.022 U	0.021 U	0.02 U	0.021 U	0.021 U	0.021 U
Perfluorooctanesulfonic acid (PFOS)	13	µg/kg	0.096^J	0.051^J	0.3^J	0.17 U	0.086^J	0.044^J	0.039 U	0.042 U	0.041 U	0.042 U
Perfluorooctanoic acid (PFOA)	19	µg/kg	1.2^J	2^J	0.5^J	0.22^J	0.06^J	0.05^J	0.048 U	0.051 U	0.051 U	0.054^J

PFAS Analyte	Screening Level ^[a]	Units	Bravo Test Stands, Alfa-Bravo Skim Pond, Bravo Skim Pond ^[b]	Bravo Test Stands, Alfa-Bravo Skim Pond, Bravo Skim Pond ^[b]	Bravo Test Stands, Alfa-Bravo Skim Pond, Bravo Skim Pond ^[b]	Building 2206 ^[b]	Building 2206 ^[b]	Building 2206 ^[b]	Building 2206 ^[b]
			BVBS1708 Direct Push BVBS1708S001 0 to 2 11/17/2022	BVBS1708 Direct Push BVBS1708S002 4 to 6 11/17/2022	BVBS1709 Direct Push BVBS1709S001 0 to 1.8 11/17/2022	EVBS2000 Hand Auger EVBS2000S001 0 to 2 11/17/2022	EVBS2000 Hand Auger EVBS2000D001 0 to 2 11/17/2022	EVBS2001 Hand Auger EVBS2001S001 0 to 1.6 11/17/2022	EVBS2002 Hand Auger EVBS2002S001 0 to 0.75 11/17/2022
HFPO-DA	23	µg/kg	0.041 U	0.041 U	0.038 U	0.04 U	0.039 U	0.037 U	0.039 U
Perfluorobutanesulfonic acid (PFBS)	1900	µg/kg	0.038 U	0.038 U	0.035 U	0.037 U	0.036 U	0.034 U	0.036 U
Perfluorohexanesulfonic acid (PFHxS)	13	µg/kg	0.029 U	0.029 U	0.027 U	0.028 U	0.028 U	0.026 U	0.028 U
Perfluorononanoic acid (PFNA)	19	µg/kg	0.022 U	0.022 U	0.027^J	0.022 U	0.021 U	0.062^J	0.098^J
Perfluorooctanesulfonic acid (PFOS)	13	µg/kg	0.12^J	0.055^J	0.09^J	0.17^J	0.19^J	0.34^J	0.51^J
Perfluorooctanoic acid (PFOA)	19	µg/kg	0.065^J	0.092^J	0.088^J	0.4^J	0.35^J	0.38^J	0.22^J

^[a] Residential Soil Ingestion Regional Screening Level for PFAS

^[b] Information identified is location ID, sampling method, sample ID, sample depth (feet), and sample date.

J = The analyte was positively identified: the associated numerical value is the approximate concentration of the analyte in the sample.

S = The sample results are unvalidated and should be used for screening purposes only.

SU = The sample results are unvalidated and should be used for screening purposes only.

U = The analyte was analyzed for but was not detected above the reported sample quantitation limit.

Bold^J = Bold text with a ^J symbol indicates a detected analyte.

µg/kg= microgram(s) per kilogram

HFPO-DA = hexafluoropropylene oxide dimer acid

ID = identification number

PFAS = per- and polyfluoroalkyl substances

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater

Table 4-3. Area II Landfill Site Summary - SI Results Compared to SLs

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Analyte	Frequency of Detection (Surface Soil)	Frequency of Exceedance (Surface Soil)	Maximum Concentration (Surface Soil) (µg/kg)	Frequency of Detection (Subsurface Soil)	Frequency of Exceedance (Subsurface Soil)	Maximum Concentration (Subsurface Soil) (µg/kg)	Frequency of Detection (Groundwater)	Frequency of Exceedance (Groundwater)	Maximum Concentration (Groundwater) (µg/L)
PFOA	2/2	0/2	0.11 J	0/1	0/1	No data	2/4	1/4	0.0068
PFOS	2/2	0/2	0.62	1/1	0/1	0.072 J	0/4	0/4	No data
PFBS	0/2	0/2	No data	0/1	0/1	No data	1/4	0/4	0.00085 J
PFHxS	0/2	0/2	No data	0/1	0/1	No data	0/4	0/4	No data
HFPO-DA	0/2	0/2	No data	0/1	0/1	No data	0/4	0/4	No data
PFNA	2/2	0/2	0.028 J	0/1	0/1	No data	1/4	0/4	0.00091 J

Note:

Results are generated from soil sample stations A2BS1243S001 (with FD), A2BS1243S002, and A2BS1244S001.

µg/kg = microgram(s) per kilogram

µg/L = microgram(s) per liter

HFPO-DA = hexafluoropropylene oxide dimer acid

PFBS = perfluorobutane sulfonate

PFHxS = perfluorohexanesulfonic acid

PFNA = perfluorononanoic acid

PFOA = perfluorooctanoic acid

PFOS = perfluorooctane sulfonate

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater

Table 4-4. Building 2206 Site Summary - SI Results Compared to SLs

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Analyte	Frequency of Detection (Surface Soil)	Frequency of Exceedance (Surface Soil)	Maximum Concentration (Surface Soil) (µg/kg)	Frequency of Detection (Groundwater)	Frequency of Exceedance (Groundwater)	Maximum Concentration (Groundwater) (µg/L)
PFOA	3/3	0/3	0.4	2/2	2/2	2.9
PFOS	3/3	0/3	0.51	2/2	2/2	0.014
PFBS	0/3	0/3	No data	2/2	0/2	0.0074
PFHxS	0/3	0/3	No data	2/2	0/2	0.0027
HFPO-DA	0/3	0/3	No data	0/2	0/2	No data
PFNA	2/3	0/3	0.098 J	2/2	0/2	0.006

Note:

Results are generated from soil sample stations EVBS2000S001 (with FD), EVBS2001S001, and EVBS2002S001.

µg/kg = microgram(s) per kilogram

µg/L = microgram(s) per liter

HFPO-DA = hexafluoropropylene oxide dimer acid

PFBS = perfluorobutane sulfonate

PFHxS = perfluorohexanesulfonic acid

PFNA = perfluorononanoic acid

PFOA = perfluorooctanoic acid

PFOS = perfluorooctane sulfonate

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater

Table 4-5. Area II Sewage Treatment Plant and Building 2207 Site Summary - SI Results Compared to SLs

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Analyte	Frequency of Detection (Surface Soil)	Frequency of Exceedance (Surface Soil)	Maximum Concentration (Surface Soil) (µg/kg)	Frequency of Detection (Subsurface Soil)	Frequency of Exceedance (Subsurface Soil)	Maximum Concentration (Subsurface Soil) (µg/kg)	Frequency of Detection (Groundwater)	Frequency of Exceedance (Groundwater)	Maximum Concentration (Groundwater) (µg/L)
PFOA	4/4	0/4	0.71	3/3	0/3	0.33	1/1	1/1	0.012
PFOS	4/4	0/4	0.29	3/3	0/3	0.32	1/1	1/1	0.0042
PFBS	0/4	0/4	No data	0/3	0/3	No data	1/1	0/1	0.0033
PFHxS	0/4	0/4	No data	1/3	0/3	0.32 J	1/1	0/1	0.01
HFPO-DA	0/4	0/4	No data	0/3	0/3	No data	0/1	0/1	No data
PFNA	3/4	0/4	0.12 J	1/3	0/3	0.035 J	1/1	0/1	0.00094 J

Note:

Results are generated from soil sample stations EVBS2003S001, EVBS2004S001, EVBS2004S002, APBS1245S001, APBS1245S002, APBS12465S001, and APBS1245S002

µg/kg = microgram(s) per kilogram

µg/L = microgram(s) per liter

HFPO-DA = hexafluoropropylene oxide dimer acid

PFBS = perfluorobutane sulfonate

PFHxS = perfluorohexanesulfonic acid

PFNA = perfluorononanoic acid

PFOA = perfluorooctanoic acid

PFOS = perfluorooctane sulfonate

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater

Table 4-6. Alfa Test Stands, Alfa Retention Ponds, and Alfa Skim Pond Site Summary - SI Results Compared to SLs

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Analyte	Frequency of Detection (Surface Soil)	Frequency of Exceedance (Surface Soil)	Maximum Concentration (Surface Soil) (µg/kg)	Frequency of Detection (Subsurface Soil)	Frequency of Exceedance (Subsurface Soil)	Maximum Concentration (Subsurface Soil) (µg/kg)	Frequency of Detection (Groundwater)	Frequency of Exceedance (Groundwater)	Maximum Concentration (Groundwater) (µg/L)
PFOA	4/4	0/4	1.2	1/1	0/1	2	5/5	5/5	0.12
PFOS	3/4	0/4	0.3	1/1	0/1	0.051 J	2/5	0/5	0.002
PFBS	0/4	0/4	No data	0/1	0/1	No data	4/5	0/5	0.0021
PFHxS	0/4	0/4	No data	0/1	0/1	No data	5/5	0/5	0.0017
HFPO-DA	0/4	0/4	No data	0/1	0/1	No data	0/5	0/5	No data
PFNA	3/4	0/4	0.12 J	0/1	0/1	No data	4/5	1/5	0.023

Note:

Results are generated from soil sample stations AABS1262S001, AABS1262S002, AABS1263S001, AABS1264S001, and AABS1265S001.

µg/kg = microgram(s) per kilogram

µg/L = microgram(s) per liter

HFPO-DA = hexafluoropropylene oxide dimer acid

PFBS = perfluorobutane sulfonate

PFHxS = perfluorohexanesulfonic acid

PFNA = perfluorononanoic acid

PFOA = perfluorooctanoic acid

PFOS = perfluorooctane sulfonate

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater

Table 4-7. Bravo Test Stands, Alfa-Bravo Skim Pond, and Bravo Skim Pond Site Summary - SI Results Compared to SLs

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Analyte	Frequency of Detection (Surface Soil)	Frequency of Exceedance (Surface Soil)	Maximum Concentration (Surface Soil) (µg/kg)	Frequency of Detection (Subsurface Soil)	Frequency of Exceedance (Subsurface Soil)	Maximum Concentration (Subsurface Soil) (µg/kg)	Frequency of Detection (Groundwater)	Frequency of Exceedance (Groundwater)	Maximum Concentration (Groundwater) (µg/L)
PFOA	2/2	0/2	0.088 J	1/1	0/1	0.092 J	4/5	4/5	0.51
PFOS	2/2	0/2	0.12 J	1/1	0/1	0.055 J	1/5	1/5	0.0044
PFBS	0/2	0/2	No data	0/1	0/1	No data	2/5	0/5	0.005
PFHxS	0/2	0/2	No data	0/1	0/1	No data	3/5	0/5	0.002
HFPO-DA	0/2	0/2	No data	0/1	0/1	No data	0/5	0/5	No data
PFNA	1/2	0/2	0.027 J	0/1	0/1	No data	0/5	0/5	No data

Note:

Results are generated from soil sample stations BVBS1708S001, BVBS1708S002, and BVBS1709S001.

µg/kg = microgram(s) per kilogram

µg/L = microgram(s) per liter

HFPO-DA = hexafluoropropylene oxide dimer acid

PFBS = perfluorobutane sulfonate

PFHxS = perfluorohexanesulfonic acid

PFNA = perfluorononanoic acid

PFOA = perfluorooctanoic acid

PFOS = perfluorooctane sulfonate

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater

Table 4-8. Coca Test Stands and Coca Skim Pond Site Summary - SI Results Compared to SLs

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Analyte	Frequency of Detection (Surface Soil)	Frequency of Exceedance (Surface Soil)	Maximum Concentration (Surface Soil) (µg/kg)	Frequency of Detection (Subsurface Soil)	Frequency of Exceedance (Subsurface Soil)	Maximum Concentration (Subsurface Soil) (µg/kg)	Frequency of Detection (Groundwater)	Frequency of Exceedance (Groundwater)	Maximum Concentration (Groundwater) (µg/L)
PFOA	1/2	0/2	0.05 J	0/2	0/2	No data	5/5	5/5	0.071
PFOS	1/2	0/2	0.044 J	0/2	0/2	No data	4/5	5/5	0.014
PFBS	0/2	0/2	No data	0/2	0/2	No data	5/5	0/5	0.01
PFHxS	0/2	0/2	No data	0/2	0/2	No data	5/5	0/5	0.0033
HFPO-DA	0/2	0/2	No data	0/2	0/2	No data	0/5	0/5	No data
PFNA	0/2	0/2	No data	0/2	0/2	No data	5/5	2/5	0.017

Note:

Results are generated from soil sample stations CABS1324S001, CABS1324S002, CABS1325S001, and CABS1325S002.

µg/kg = microgram(s) per kilogram

µg/L = microgram(s) per liter

HFPO-DA = hexafluoropropylene oxide dimer acid

PFBS = perfluorobutane sulfonate

PFHxS = perfluorohexanesulfonic acid

PFNA = perfluorononanoic acid

PFOA = perfluorooctanoic acid

PFOS = perfluorooctane sulfonate

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater

Table 4-9. Delta Test Stands and Delta Skim Pond Site Summary - SI Results Compared to SLs

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

Analyte	Frequency of Detection (Surface Soil)	Frequency of Exceedance (Surface Soil)	Maximum Concentration (Surface Soil) (µg/kg)	Frequency of Detection (Groundwater)	Frequency of Exceedance (Groundwater)	Maximum Concentration (Groundwater) (µg/L)
PFOA	1/1	0/1	0.054 J	2/2	1/2	0.018
PFOS	0/1	0/1	No data	2/2	0/2	0.0023
PFBS	0/1	0/1	No data	2/2	0/2	0.0023
PFHxS	0/1	0/1	No data	2/2	0/2	0.00094 J
HFPO-DA	0/1	0/1	No data	0/2	0/2	No data
PFNA	0/1	0/1	No data	0/2	0/2	No data

Note:

Results are generated from soil sample station DABS1284S001.

µg/kg = microgram(s) per kilogram

µg/L = microgram(s) per liter

HFPO-DA = hexafluoropropylene oxide dimer acid

PFBS = perfluorobutane sulfonate

PFHxS = perfluorohexanesulfonic acid

PFNA = perfluorononanoic acid

PFOA = perfluorooctanoic acid

PFOS = perfluorooctane sulfonate

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater

Table 5-1. Site Inspection Summary and Recommendations

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

AOPC	Rationale	Maximum Concentrations of Exceedances	Recommendation
Area II Landfill	<ul style="list-style-type: none"> ▪ PFOA was detected in two wells and at concentrations exceeding the SL in groundwater in one well. PFBS and PFNA were detected below the SLs in one of four wells. PFOS, PFHxS, and HFPO-DA were not detected. Although the extent of PFOA impacts is not delineated, the exceedance is inconsequential (0.0068 µg/L versus SL of 0.006 µg/L). ▪ PFOA, PFOS, and PFNA were detected at concentrations below the SLs in two of two surface soil samples. PFBS, PFHxS, and HFPO-DA were not detected. ▪ PFOS was detected at concentrations below the SLs in one of one subsurface sample. PFOA, PFBS, PFHxS, HFPO-DA, and PFNA were not detected. ▪ The groundwater exceedance monitoring well (RD-81-1) is downgradient northeast of the Area II Landfill. 	<ul style="list-style-type: none"> - No exceedances in surface or subsurface soil. Groundwater (µg/L) - PFOA: 0.0068 	Further evaluation is not recommended
Building 2206	<ul style="list-style-type: none"> ▪ PFOA and PFOS were detected at concentrations exceeding the SLs in groundwater in the two wells sampled. PFBS, PFHxS, and PFNA were detected below the SLs in the two wells sampled. HFPO-DA was not detected. The extent of the exceedances is not delineated, and the maximum PFOA concentration is three orders of magnitude above the SLs. ▪ PFOA and PFOS were detected at concentrations below the SLs in three of three surface soil samples. PFNA was detected at concentrations below the SLs in two of three surface soil samples. PFBS, PFHxS, and HFPO-DA were not detected. ▪ The locations of the groundwater exceedance monitoring wells (PZ-140 and ND-125-1) are downgradient (to the north) of Building 2206. 	<ul style="list-style-type: none"> - No exceedances in surface soil. Groundwater (µg/L) - PFOS: 0.014 S - PFOA: 2.9 	Further evaluation is recommended in groundwater and soil
Area II Sewage Treatment Plant and Building 2207	<ul style="list-style-type: none"> ▪ PFOA and PFOS were detected at concentrations exceeding the SLs in groundwater in the one well sampled. PFBS, PFHxS, and PFNA were detected below the SLs in the one well sampled. HFPO-DA was not detected. The extent of the exceedances is not delineated, and the maximum PFOA concentration is one order of magnitude higher than the SL. ▪ PFOA and PFOS were detected at concentrations below the SLs in four of four surface soil samples. PFNA was detected at concentrations below the SLs in three of four surface soil samples. PFBS, PFHxS, and HFPO-DA were not detected. ▪ PFOA and PFOS were detected at concentrations below the SLs in three of three subsurface surface soil samples. PFHxS and PFNA were detected at concentrations below the SLs in two of three subsurface surface soil samples. PFBS and HFPO-DA were not detected. ▪ The groundwater exceedance monitoring well (RD-26) is cross-gradient to the west of Building 2207. 	<ul style="list-style-type: none"> - No exceedances in surface or subsurface soil. Groundwater (µg/L) - PFOS: 0.0042 - PFOA: 0.012 	Further evaluation is recommended in groundwater and soil

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater

Table 5-1. Site Inspection Summary and Recommendations

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

AOPC	Rationale	Maximum Concentrations of Exceedances	Recommendation
Alfa Test Stands and Alfa Skim Pond	<ul style="list-style-type: none"> ▪ PFOA was detected at concentrations exceeding the SLs in groundwater in five of five wells. PFNA was detected at a concentration exceeding the SL in groundwater in one of five wells. PFHxS was detected at concentrations below the SLs in groundwater at five of five wells. PFBS and PFNA were detected at concentrations below the SLs in groundwater in four of five wells. PFOS was detected at concentrations below the SLs in groundwater in two of five wells. HFPO-DA was not detected. The extent of the exceedances is not delineated, and the maximum PFOA concentration is one order of magnitude greater than the SL. ▪ PFOA was detected at concentrations below the SLs in four of four surface soil samples. PFOS and PFNA were detected at concentrations below the SLs in three of four surface soil samples. PFBS, PFHxS, and HFPO-DA were not detected. ▪ PFOA and PFOS were detected at concentrations below the SLs in one of one subsurface surface soil samples. PFBS, PFHxS, HFPO-DA, and PFNA were not detected. ▪ The locations of the groundwater exceedance monitoring wells (HAR-11, HAR-20, RD-49A, RD-49B, and PZ-154) are within and downgradient of the Alfa Test Stands and Alfa Skim Pond. 	<ul style="list-style-type: none"> - No exceedances in surface or subsurface soil. Groundwater (µg/L) - PFOA: 0.12 - PFNA: 0.023 	Further evaluation is recommended in groundwater and soil
Bravo Test Stands, Alfa-Bravo Skim Pond, and Bravo Skim Pond	<ul style="list-style-type: none"> ▪ PFOA was detected at concentrations exceeding the SLs in groundwater in four of five wells. PFHxS was detected at concentrations exceeding the SLs in groundwater in three of five wells. PFBS was detected at concentrations above the SLs in groundwater at two of five wells. PFOS was detected at concentrations greater than the SLs in groundwater in one of five wells. HFPO-DS and PFNA were not detected. The extent of the exceedances is not delineated, and the maximum PFOA concentration is two orders of magnitude greater than the SL. ▪ PFOA and PFOS were detected at concentrations below the SLs in two of two surface soil samples. PFNA was detected at a concentration below the SL in one of two surface soil samples. PFBS, PFHxS, and HFPO-DA were not detected. ▪ PFOA and PFOS were detected at concentrations below the SLs in one of one subsurface surface soil samples. PFBS, PFHxS, HFPO-DA, and PFNA were not detected. ▪ The locations of the groundwater exceedance monitoring wells (HAR-09, HAR-21, HAR-19, and ND-135-1) are within and downgradient of the Bravo Test Stands, Alfa-Bravo Skim Pond, and Bravo Skim Pond. 	<ul style="list-style-type: none"> - No exceedances in surface or subsurface soil. Groundwater (µg/L) - PFOS: 0.0044 - PFOA: 0.51 	Further evaluation is recommended in groundwater and soil

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater

Table 5-1. Site Inspection Summary and Recommendations

Site Investigation Report for Per- and Polyfluoroalkyl Substances in Soil and Groundwater, Santa Susana Field Laboratory, Ventura County, California

AOPC	Rationale	Maximum Concentrations of Exceedances	Recommendation
Coca Test Stands and Coca Skim Pond	<ul style="list-style-type: none"> ▪ PFOA was detected at concentrations exceeding the SL in groundwater in five of five wells. PFOS was detected at concentrations exceeding the SL in four of five wells. PFNA was detected at concentrations exceeding the SL in groundwater in two of five wells. PFBS and PFHxS was detected at concentrations below the SLs in groundwater in five of five wells. HFPO-DA was not detected. The extent of the exceedances is not delineated and the maximum PFOA concentration is one order of magnitude greater than the SL. ▪ PFOA and PFOS were detected at concentrations below the SLs in one of two surface soil samples. PFBS, PFHxS, HFPO-DA, and PFNA were not detected. ▪ PFOA, PFOS, PFBS, PFHxS, HFPO-DA, and PFNA were not detected in subsurface soil samples. ▪ The locations of the groundwater exceedance monitoring wells (ND-113-1, PZ-017A, PZ-045, PZ-048, and RD-79) are within and downgradient of the Coca Test Stands and Coca Skim Pond. 	<ul style="list-style-type: none"> - No exceedances in surface or subsurface soil. Groundwater (µg/L) - PFOS: 0.014 - PFOA: 0.071 - PFNA: 0.017 	Further evaluation is recommended in groundwater and soil
Delta Test Stands and Delta Skim Pond	<ul style="list-style-type: none"> ▪ PFOA was detected at a concentration exceeding the SL in groundwater in one of two wells. PFOS, PFBS, and PFHxS were detected at concentrations below the SLs in groundwater in two of two wells. HFPO-DA and PFNA were not detected. The extent of the exceedances is not delineated, and the maximum PFOA concentration is one order of magnitude greater than the SL. ▪ PFOA was detected at concentrations below the SLs in one of one surface soil samples. PFBS, PFHxS, HFPO-DA, and PFNA were not detected. ▪ The groundwater exceedance monitoring well (HAR-27) is downgradient of the Delta Test Stands and Delta Skim Pond. 	<ul style="list-style-type: none"> - No exceedances in surface soil. Groundwater (µg/L) - PFOA: 0.018 	Further evaluation is recommended in groundwater and soil

µg/L= microgram(s) per liter

HFPO-DA = hexafluoropropylene oxide dimer acid

PFBS = perfluorobutane sulfonate

PFHxS = perfluorohexanesulfonic acid

PFNA = perfluorononanoic acid

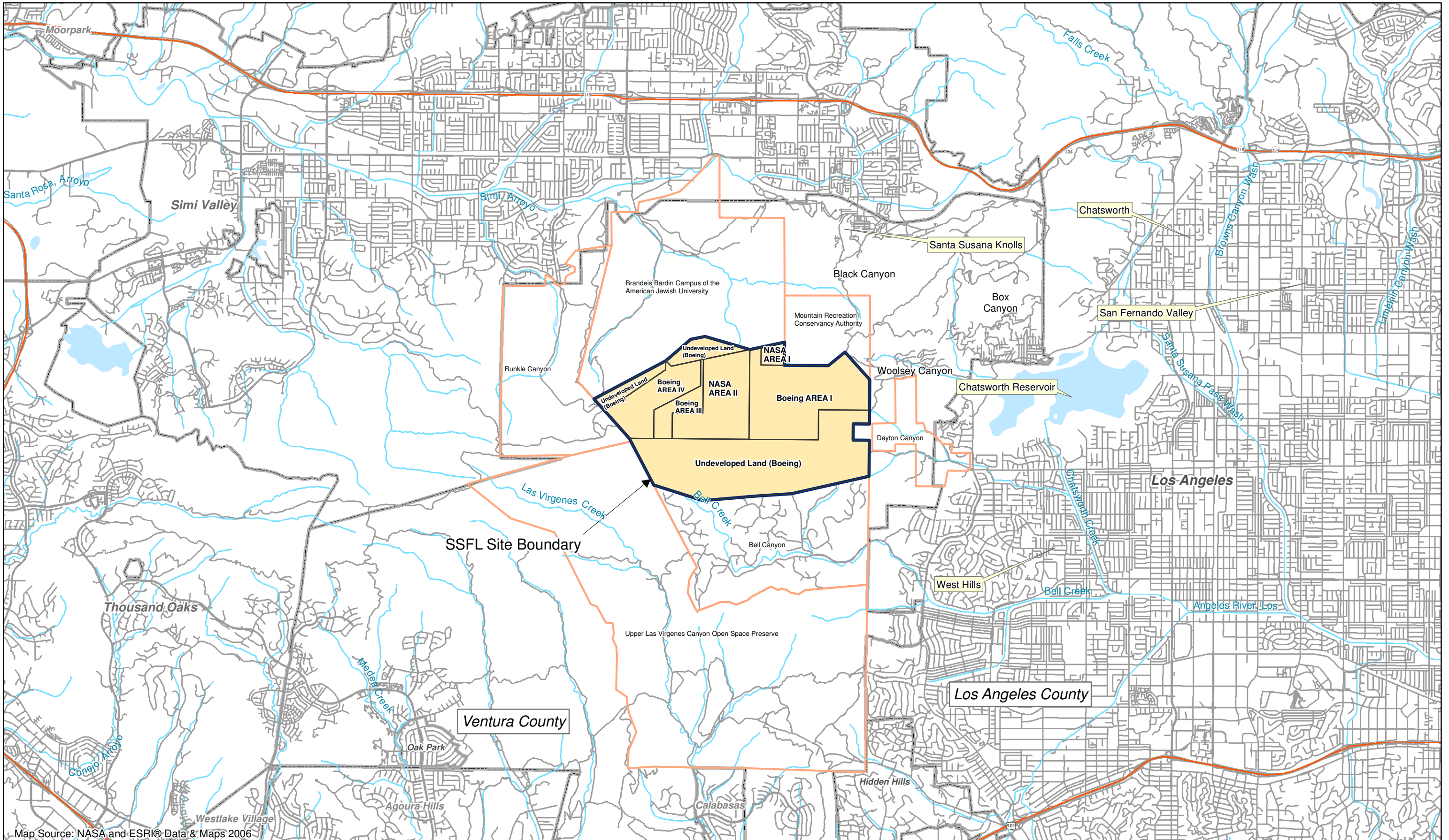
PFOA = perfluorooctanoic acid

PFOS = perfluorooctane sulfonate

SL = screening level

Figures

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Map Source: NASA and ESRI® Data & Maps 2006



05-Apr-2022

FIGURE ES-1
 SSFL Site Location
 Site Inspection Report of Per- and Polyfluoroalkyl Substances in Soil and Groundwater
 Santa Susana Field Laboratory
 Ventura County, California

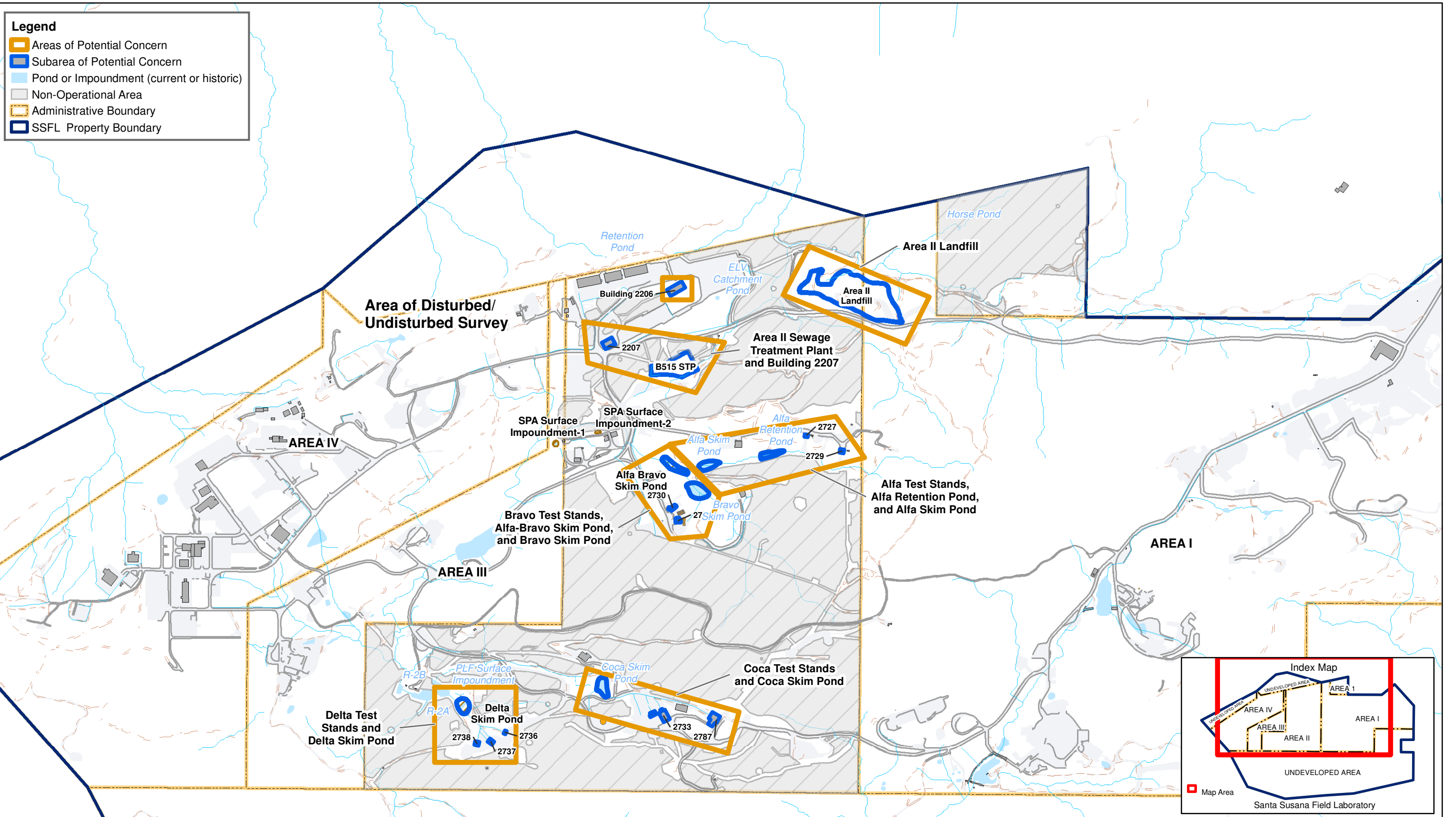
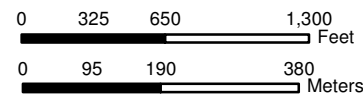
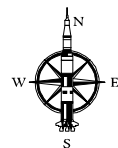


FIGURE ES-2
 SSFL Facility Layout
 Site Inspection Report of Per- and Polyfluoroalkyl Substances in Soil and Groundwater
 Santa Susana Field Laboratory
 Ventura County, California



22-Mar-2023

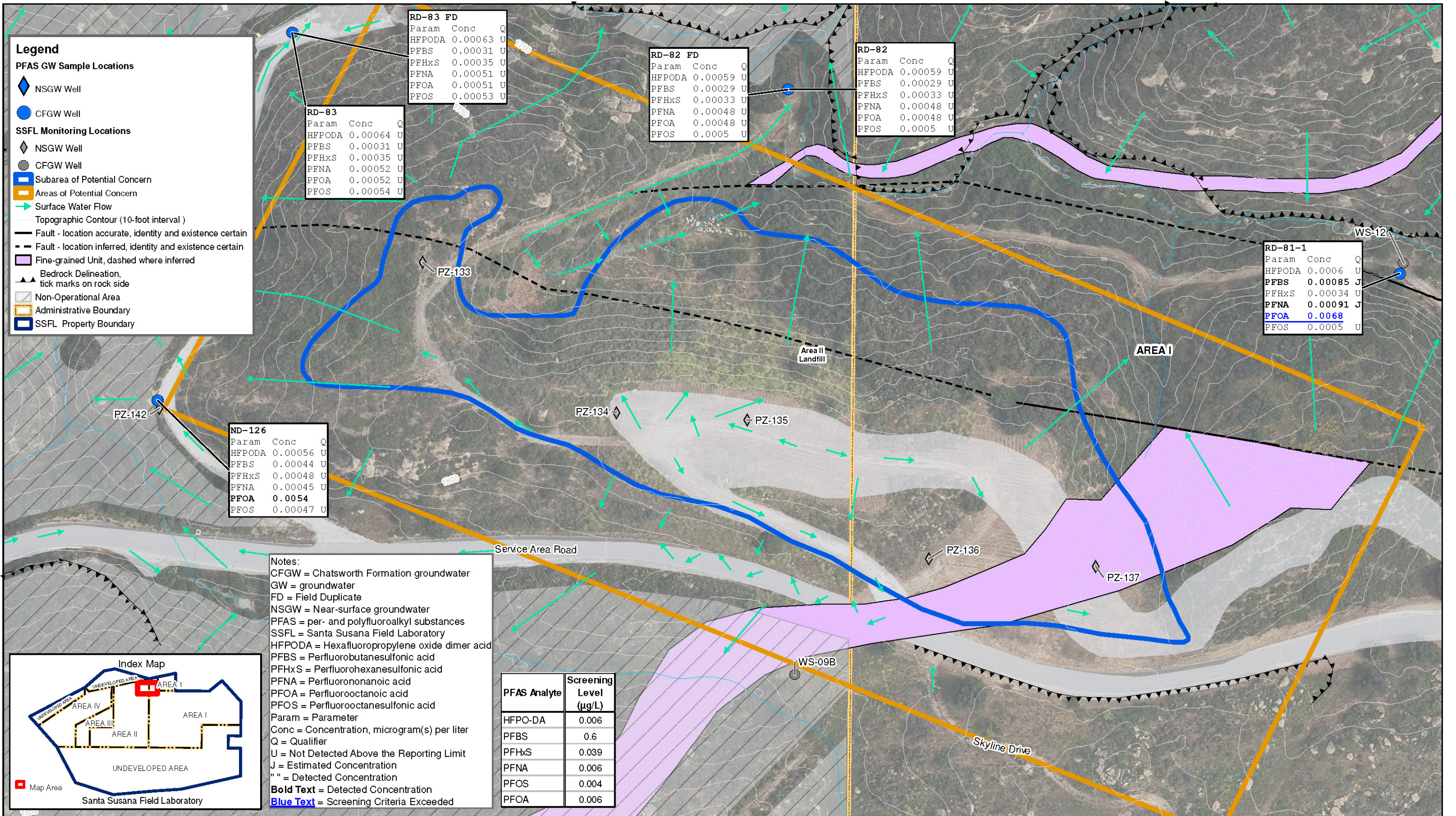


FIGURE 2-1
Summary of PFAS Results in Groundwater: Area II Landfill
Site Inspection Report of Per- and Polyfluoroalkyl Substances in Soil and Groundwater
Santa Susana Field Laboratory
Ventura County, California

Legend

Sample Locations

- ◆ NSGW Well
- CFGW Well

Monitoring Location

- ◆ NSGW Well
- CFGW Well
- ▭ Subarea of Potential Concern
- ▭ Areas of Potential Concern
- Soil Sample Locations

→ Surfacewater Flow

→ Near Surface Groundwater Flow

— Topographic Contour (10ft interval)

— Fault - location accurate, identity and existence certain

- - - Fault - location inferred, identity and existence certain

▭ Fine-grained Unit, dashed where inferred

▲ Bedrock Delineation, tick marks on rock side

▭ Non-Operational Area

▭ Administrative Boundary

▭ SSFL Property Boundary

A2BS1243

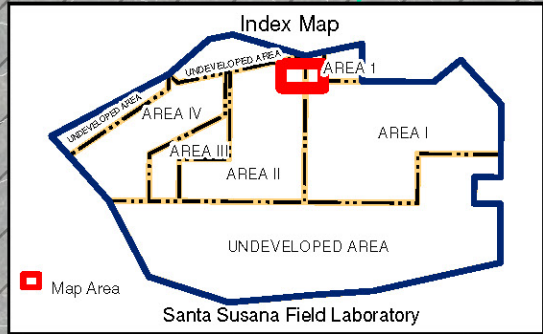
Depth	Param	Conc	Q	Date
0 - 2	HFPODA	0.041	U	11/9/2022
0 - 2	PFBS	0.038	U	11/9/2022
0 - 2	PFHxS	0.029	U	11/9/2022
0 - 2	PFNA	0.026	J	11/9/2022
0 - 2	PFOS	0.2	J	11/9/2022
0 - 2	PFOA	0.11	J	11/9/2022
6 - 8	HFPODA	0.039	U	11/9/2022
6 - 8	PFBS	0.036	U	11/9/2022
6 - 8	PFHxS	0.028	U	11/9/2022
6 - 8	PFNA	0.021	U	11/9/2022
6 - 8	PFOA	0.051	U	11/9/2022
6 - 8	PFOS	0.072	J	11/9/2022

A2BS1244

Depth	Param	Conc	Q	Date
0 - 2	HFPODA	0.038	U	11/9/2022
0 - 2	PFBS	0.036	U	11/9/2022
0 - 2	PFHxS	0.027	U	11/9/2022
0 - 2	PFNA	0.028	J	11/9/2022
0 - 2	PFOS	0.62	J	11/9/2022
0 - 2	PFOA	0.073	J	11/9/2022

Notes:

PFAS = per- and polyfluoroalkyl substances
 SSFL = Santa Susana Field Laboratory
 HFPODA = Hexafluoropropylene oxide dimer acid
 PFBS = Perfluorobutanesulfonic acid
 PFHxS = Perfluorohexanesulfonic acid
 PFNA = Perfluorononanoic acid
 PFOA = Perfluorooctanoic acid
 PFOS = Perfluorooctanesulfonic acid
 Param = Parameter
 Conc = Concentration, microgram(s) per kilogram
 Q = Qualifier
 U = Not Detected Above the Reporting Limit
 J = Estimated Concentration
 " " = Detected Concentration
Bold Text = Screening Criteria Detected



PFAS Analyte	Screening Level (µg/kg)
HFPO-DA	23
PFBS	1900
PFHxS	13
PFNA	19
PFOS	13
PFOA	19

12-Jun-2023
 Drawn By:
 Erin Epling

FIGURE 2-2
 Summary of PFAS Results in Soil: Area II Landfill
 Site Inspection Report of Per- and Polyfluoroalkyl Substances in Soil and Groundwater
 Santa Susana Field Laboratory
 Ventura County, California

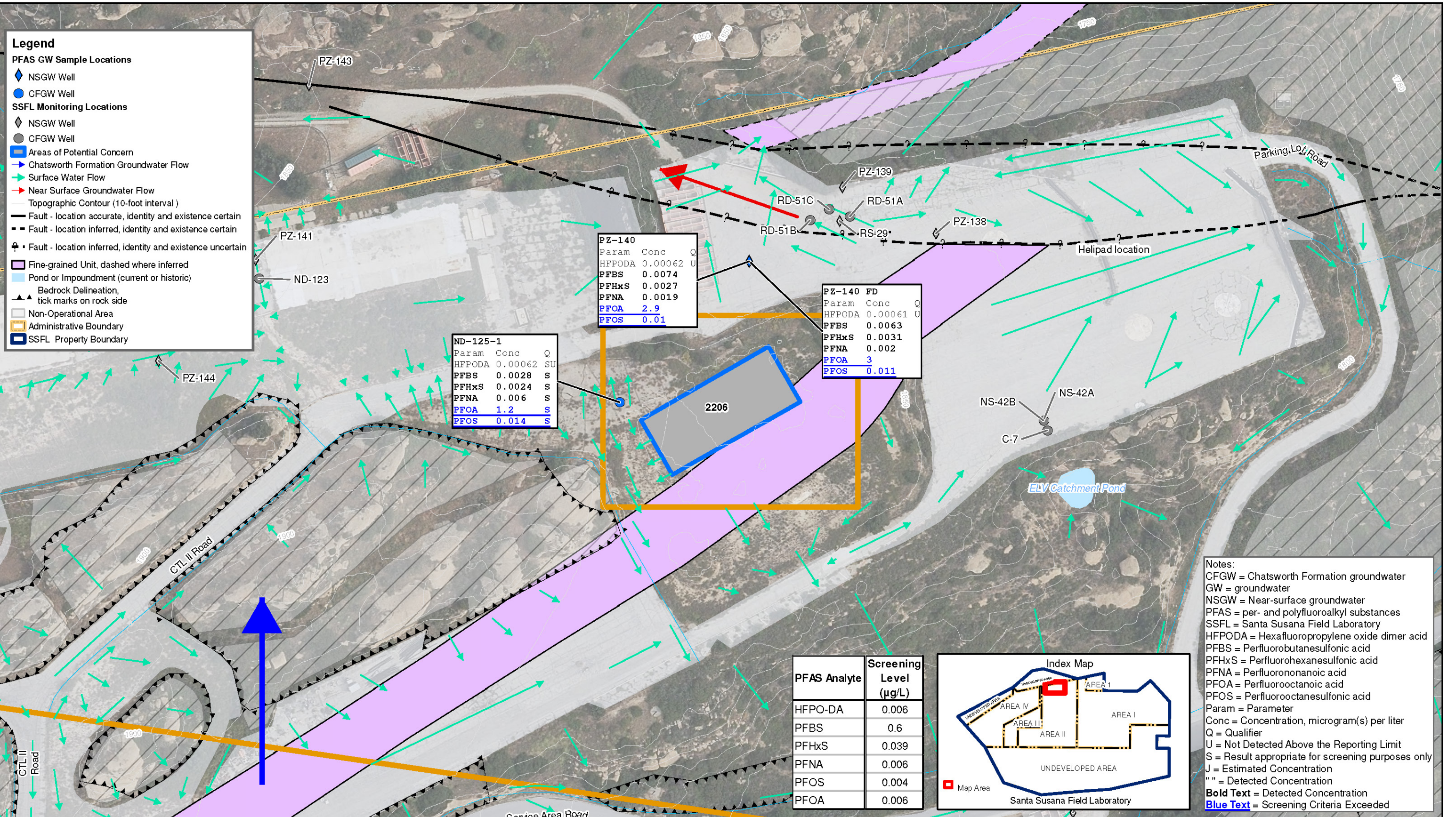
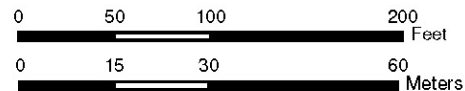
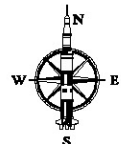
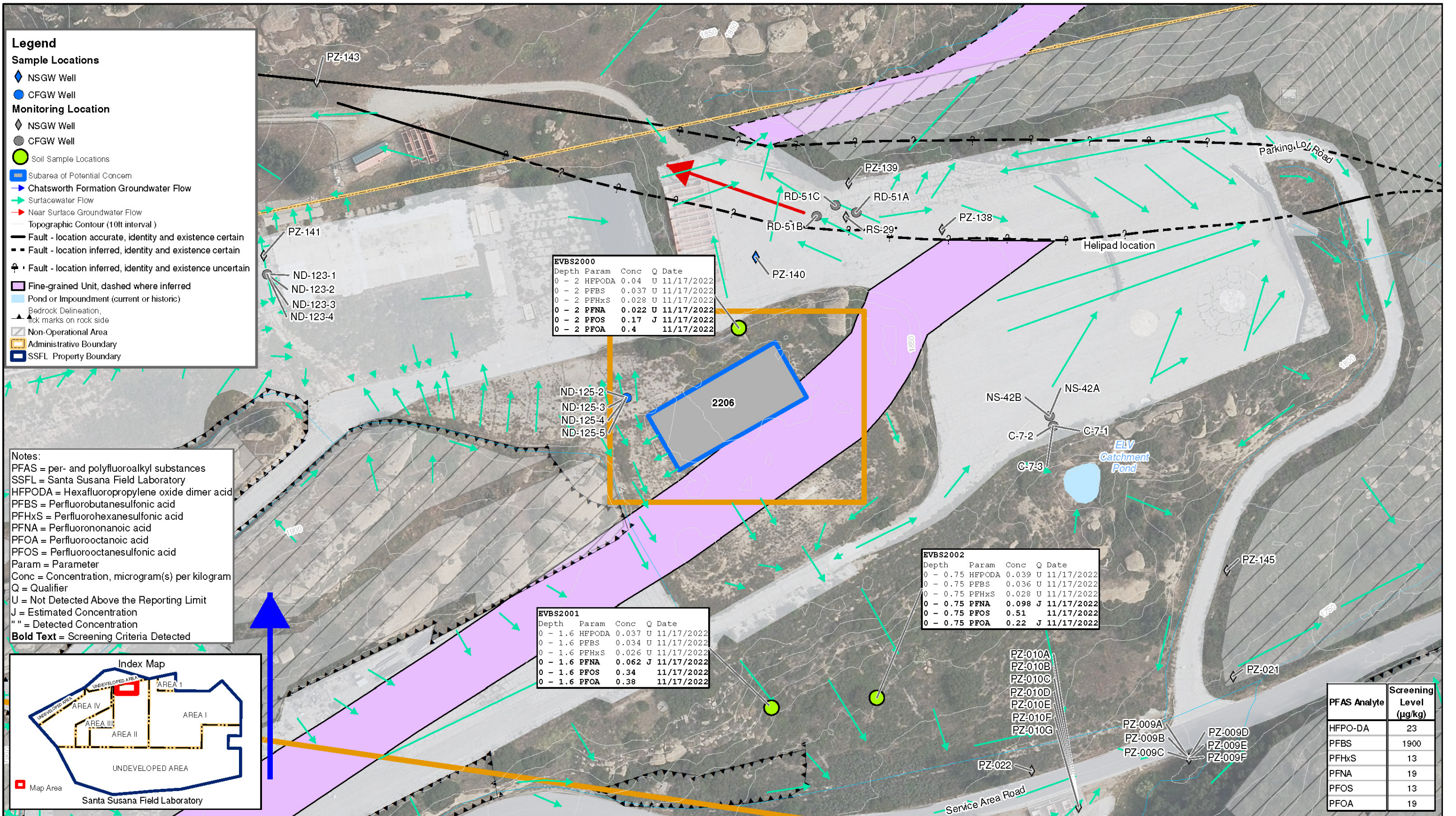


FIGURE 2-3
 Summary of PFAS Results in Groundwater: Building 2206
 Site Inspection Report of Per- and Polyfluoroalkyl Substances in Soil and Groundwater
 Santa Susana Field Laboratory
 Ventura County, California



22-May-2023
 Drawn By:
 Erin Epling



EVBS2000				
Depth	Param	Conc	Q	Date
0 - 2	HFPODA	0.04	U	11/17/2022
0 - 2	PFBS	0.037	U	11/17/2022
0 - 2	PFHxS	0.028	U	11/17/2022
0 - 2	PFNA	0.022	J	11/17/2022
0 - 2	PFOS	0.17	J	11/17/2022
0 - 2	PFOA	0.4		11/17/2022

EVBS2001				
Depth	Param	Conc	Q	Date
0 - 1.6	HFPODA	0.037	U	11/17/2022
0 - 1.6	PFBS	0.034	U	11/17/2022
0 - 1.6	PFHxS	0.026	U	11/17/2022
0 - 1.6	PFNA	0.062	J	11/17/2022
0 - 1.6	PFOS	0.34		11/17/2022
0 - 1.6	PFOA	0.38		11/17/2022

EVBS2002				
Depth	Param	Conc	Q	Date
0 - 0.75	HFPODA	0.039	U	11/17/2022
0 - 0.75	PFBS	0.036	U	11/17/2022
0 - 0.75	PFHxS	0.028	U	11/17/2022
0 - 0.75	PFNA	0.098	J	11/17/2022
0 - 0.75	PFOS	0.51		11/17/2022
0 - 0.75	PFOA	0.22	J	11/17/2022

PFAS Analyte	Screening Level (µg/kg)
HFPO-DA	23
PFBS	1900
PFHxS	13
PFNA	19
PFOS	13
PFOA	19

Notes:
 PFAS = per- and polyfluoroalkyl substances
 SSFL = Santa Susana Field Laboratory
 HFPODA = Hexafluoropropylene oxide dimer acid
 PFBS = Perfluorobutanesulfonic acid
 PFHxS = Perfluorohexanesulfonic acid
 PFNA = Perfluorononanoic acid
 PFOA = Perfluorooctanoic acid
 PFOS = Perfluorooctanesulfonic acid
 Param = Parameter
 Conc = Concentration, microgram(s) per kilogram
 Q = Qualifier
 U = Not Detected Above the Reporting Limit
 J = Estimated Concentration
 " " = Detected Concentration
Bold Text = Screening Criteria Detected

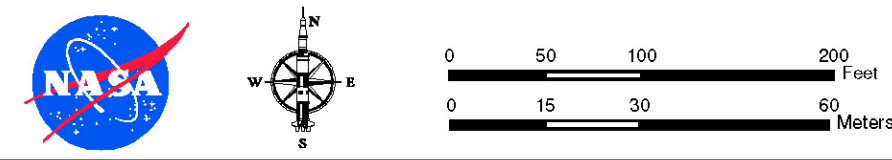
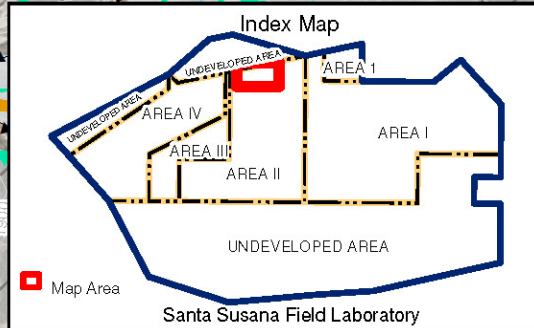
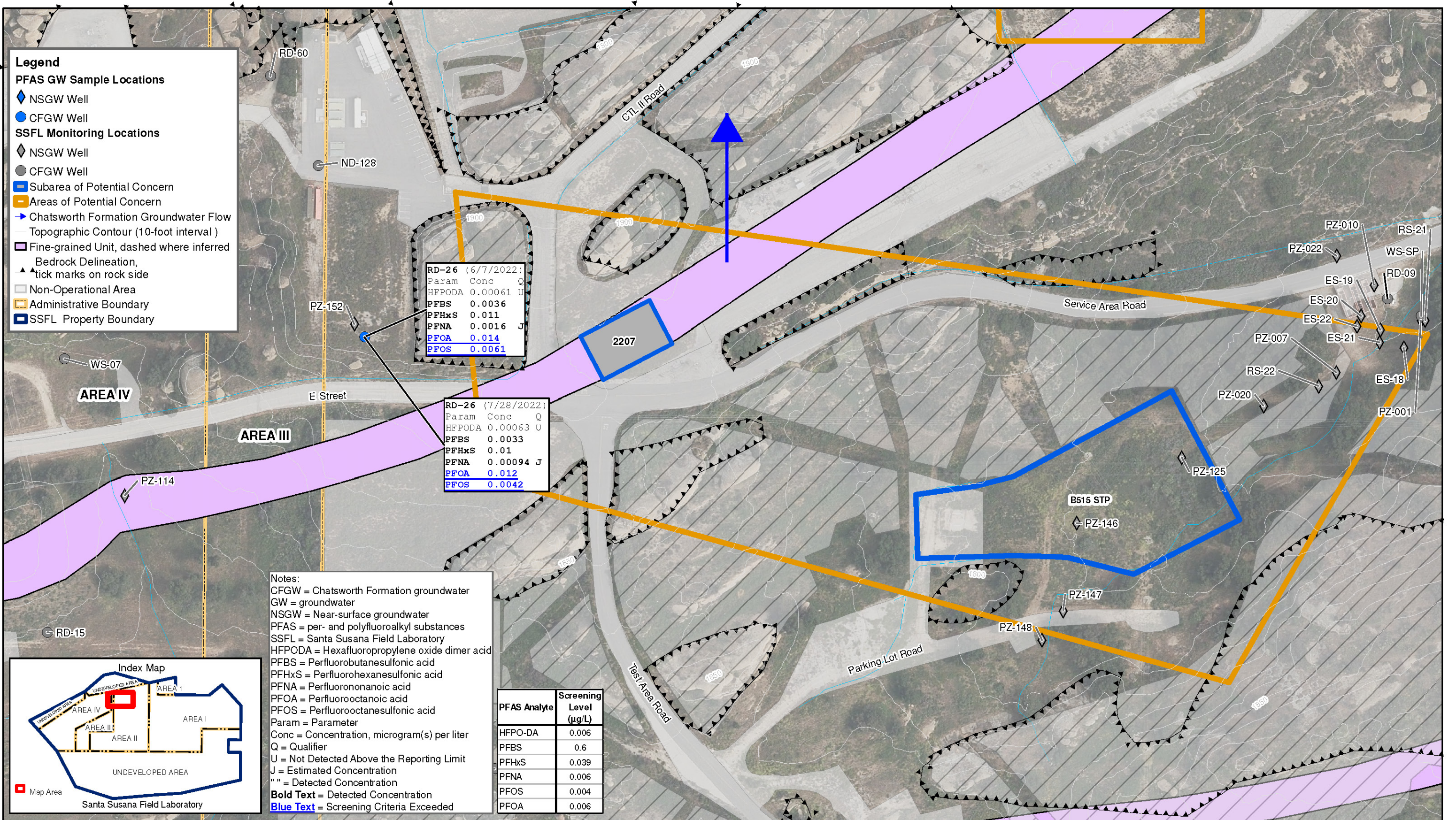


FIGURE 2-4
 Summary of PFAS Results in Soil: Building 2206
 Site Inspection Report of Per- and Polyfluoroalkyl Substances in Soil and Groundwater
 Santa Susana Field Laboratory
 Ventura County, California



Legend

- PFAS GW Sample Locations
 - ◆ NSGW Well
 - CFGW Well
- SSFL Monitoring Locations
 - ◆ NSGW Well
 - CFGW Well
- Subarea of Potential Concern
- Areas of Potential Concern
- Chatsworth Formation Groundwater Flow
- Topographic Contour (10-foot interval)
- Fine-grained Unit, dashed where inferred
- Bedrock Delineation, tick marks on rock side
- Non-Operational Area
- Administrative Boundary
- SSFL Property Boundary

RD-26 (6/7/2022)

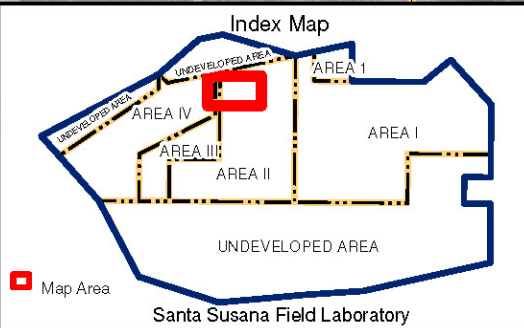
Param	Conc	Q
HFPODA	0.00061	U
PFBS	0.0036	
PFHxS	0.011	
PFNA	0.0016	J
PFOA	0.014	
PFOS	0.0061	

RD-26 (7/28/2022)

Param	Conc	Q
HFPODA	0.00063	U
PFBS	0.0033	
PFHxS	0.01	
PFNA	0.00094	J
PFOA	0.012	
PFOS	0.0042	

PFAS Analyte	Screening Level (µg/L)
HFPO-DA	0.006
PFBS	0.6
PFHxS	0.039
PFNA	0.006
PFOS	0.004
PFOA	0.006

Notes:
 CFGW = Chatsworth Formation groundwater
 GW = groundwater
 NSGW = Near-surface groundwater
 PFAS = per- and polyfluoroalkyl substances
 SSFL = Santa Susana Field Laboratory
 HFPODA = Hexafluoropropylene oxide dimer acid
 PFBS = Perfluorobutanesulfonic acid
 PFHxS = Perfluorohexanesulfonic acid
 PFNA = Perfluorononanoic acid
 PFOA = Perfluorooctanoic acid
 PFOS = Perfluorooctanesulfonic acid
 Param = Parameter
 Conc = Concentration, microgram(s) per liter
 Q = Qualifier
 U = Not Detected Above the Reporting Limit
 J = Estimated Concentration
 " " = Detected Concentration
Bold Text = Detected Concentration
Blue Text = Screening Criteria Exceeded



22-May-2023
 Drawn By:
 Erin Epling

FIGURE 2-5
 Summary of PFAS Results in Groundwater: Area II Sewage Treatment Plant and Building 2207
 Site Inspection Report of Per- and Polyfluoroalkyl Substances in Soil and Groundwater
 Santa Susana Field Laboratory
 Ventura County, California

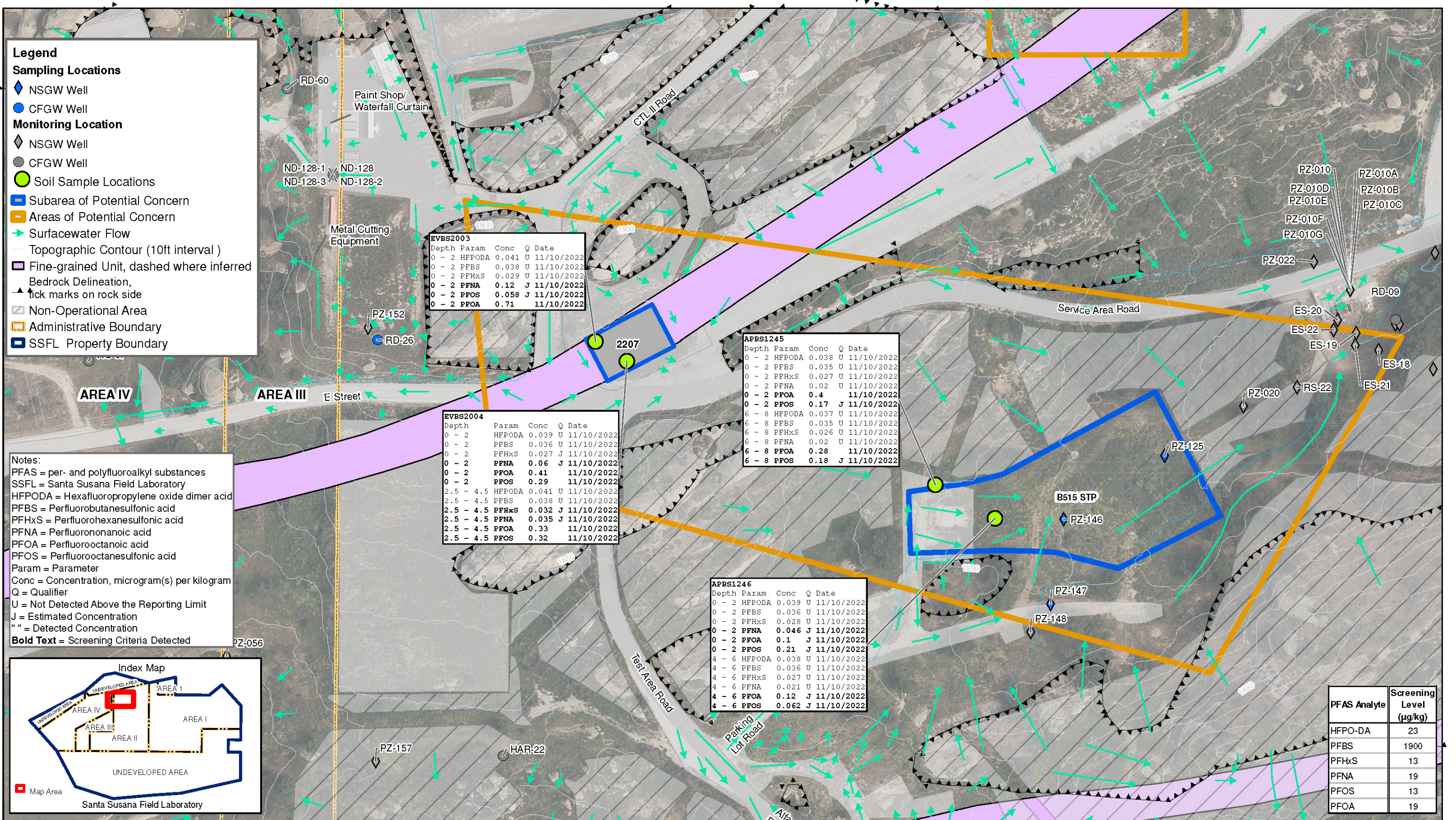
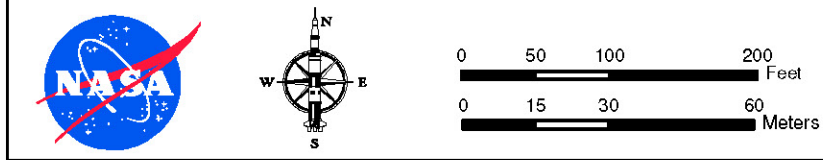


FIGURE 2-6
 Summary of PFAS Results in Soil: Area II Sewage Treatment Plant and Building 2207
 Site Inspection Report of Per- and Polyfluoroalkyl Substances in Soil and Groundwater
 Santa Susana Field Laboratory
 Ventura County, California



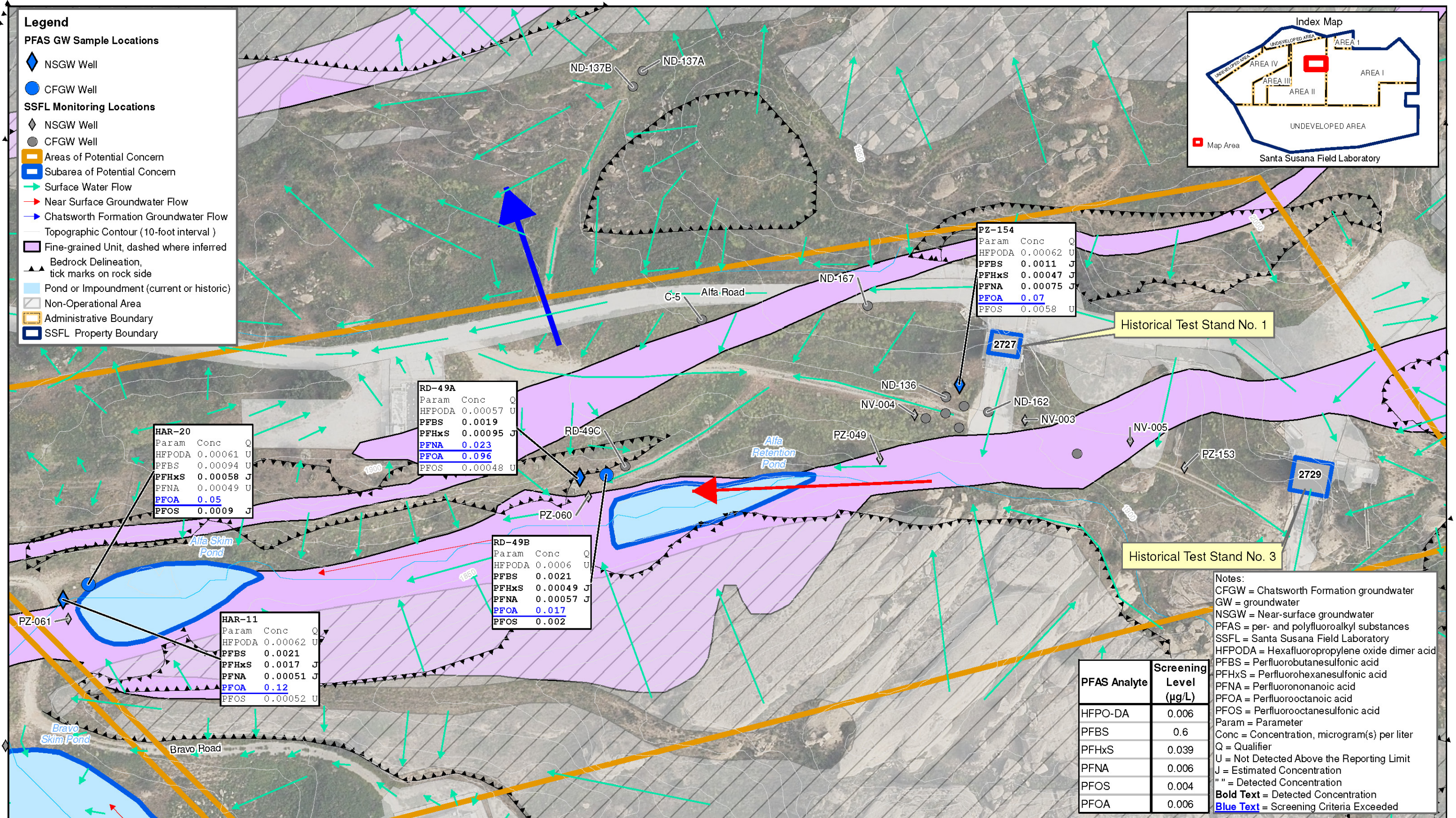
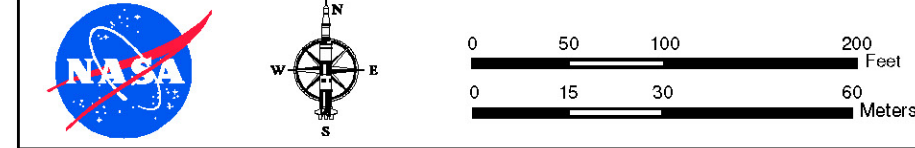


FIGURE 2-7
 Summary of PFAS Results in Groundwater: Alfa Test Stands and Alfa Skim Pond
 Site Inspection Report of Per- and Polyfluoroalkyl Substances in Soil and Groundwater
 Santa Susana Field Laboratory
 Ventura County, California



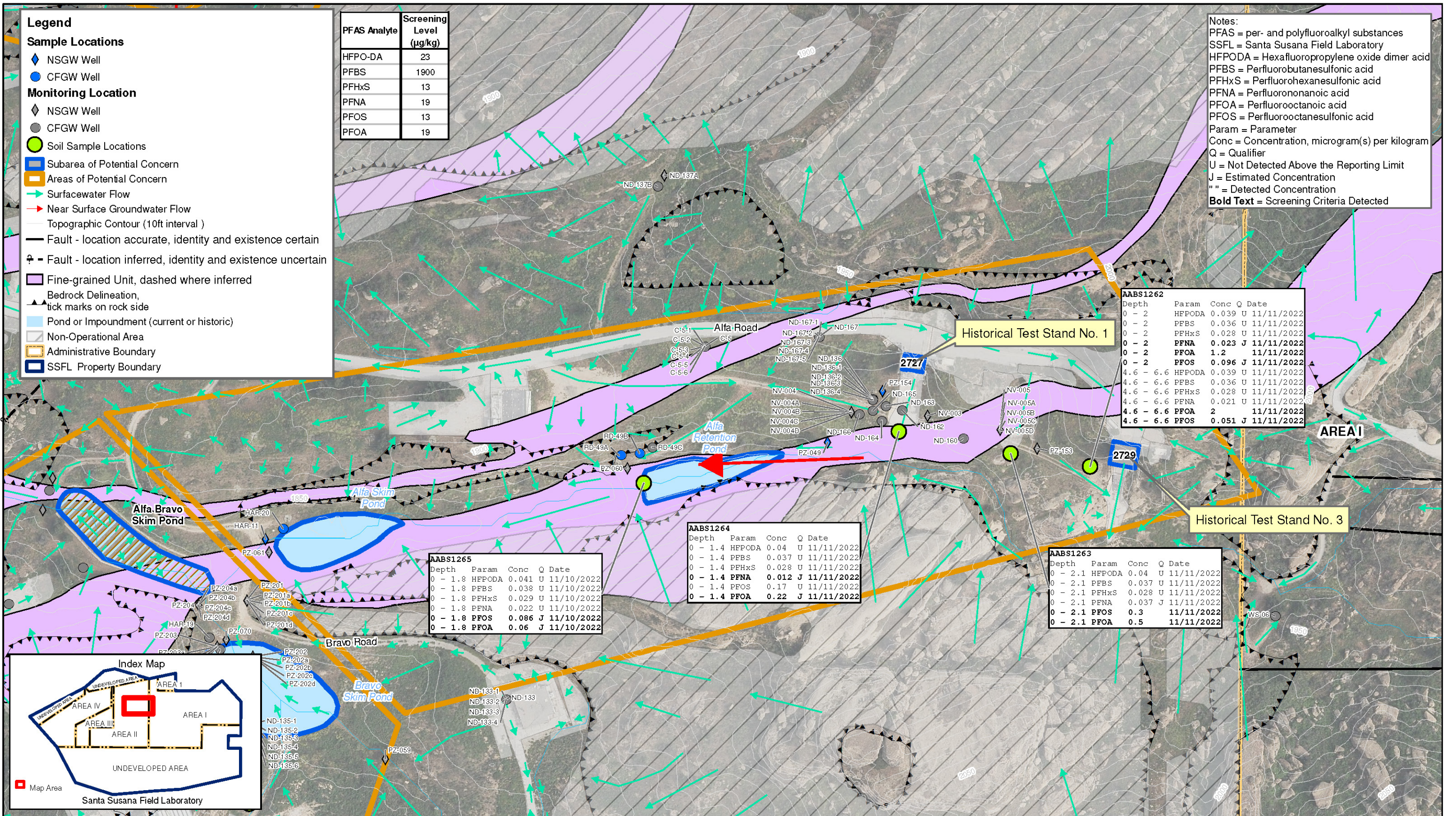


FIGURE 2-8
 Summary of PFAS Results in Soil: Alfa Test Stands and Alfa Skim Pond
 Site Inspection Report of Per- and Polyfluoroalkyl Substances in Soil and Groundwater
 Santa Susana Field Laboratory
 Ventura County, California

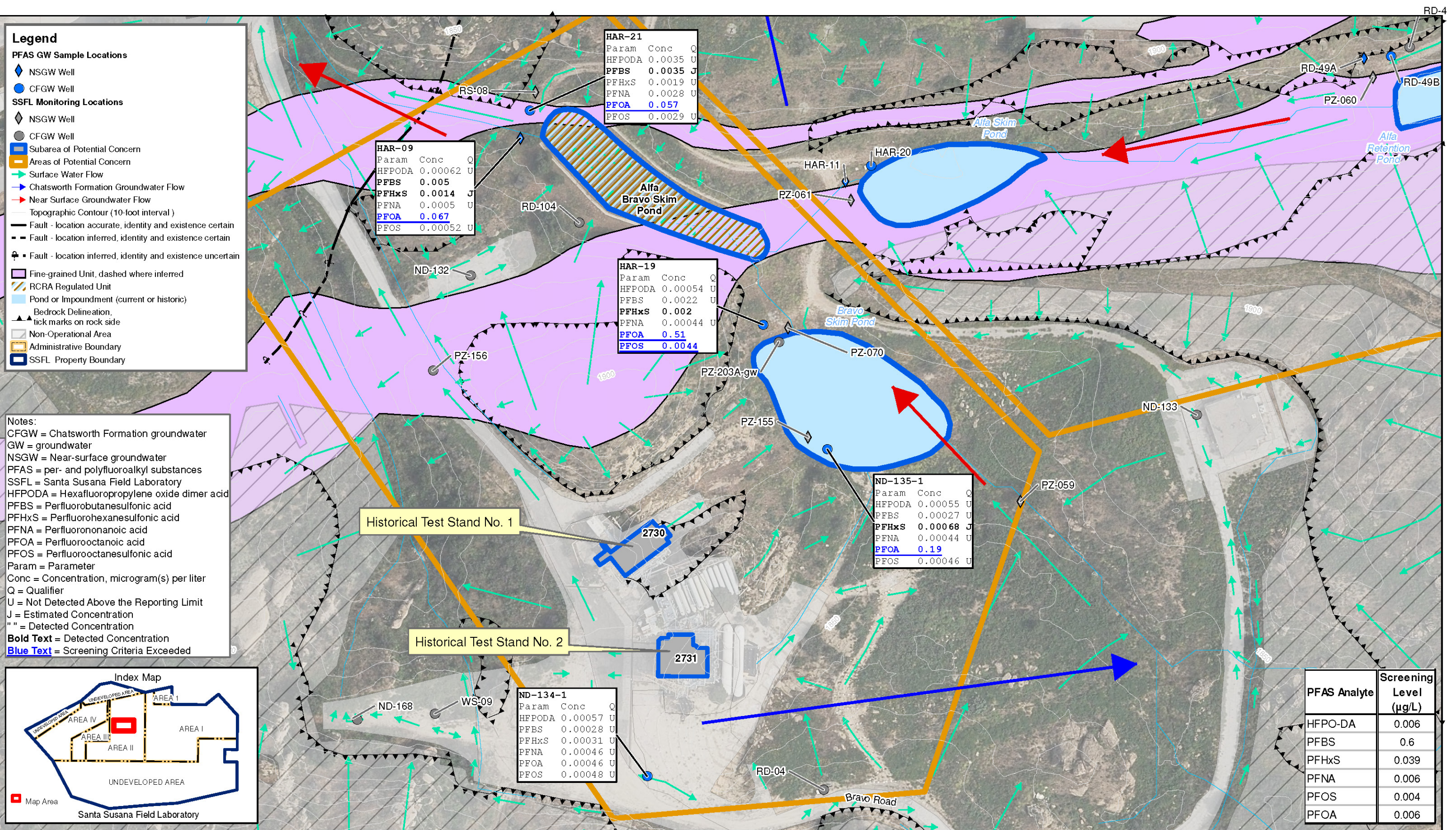
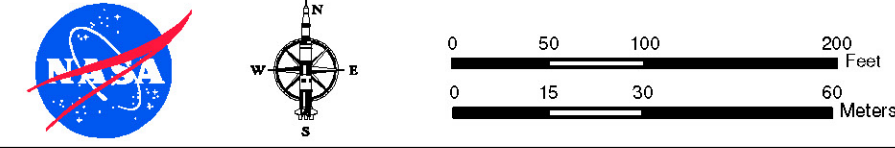


FIGURE 2-9
 Summary of PFAS Results in Groundwater: Bravo Test Stands, Alfa-Bravo Skim Pond, and Bravo Skim Pond
 Site Inspection Report of Per- and Polyfluoroalkyl Substances in Soil and Groundwater
 Santa Susana Field Laboratory
 Ventura County, California



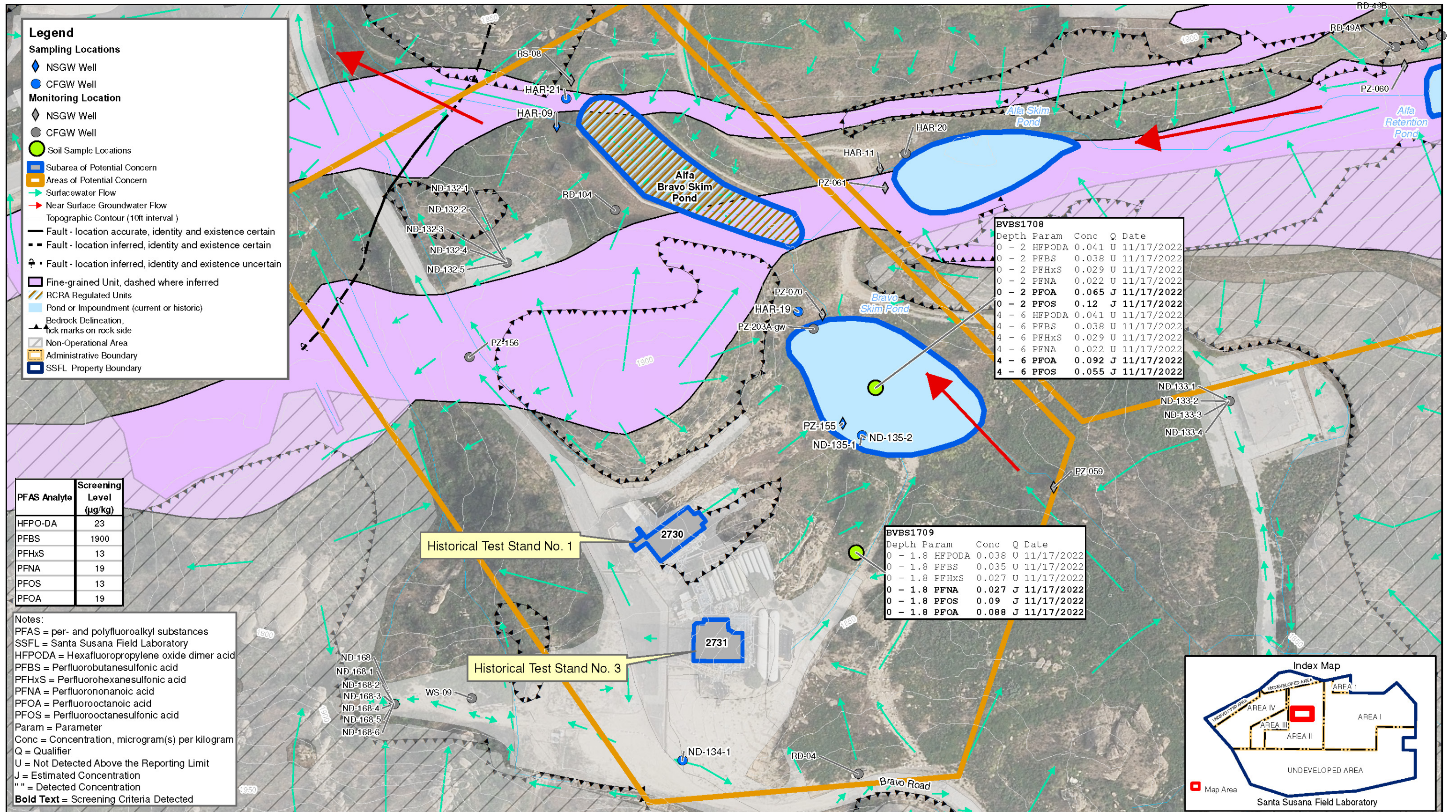
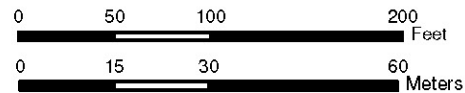
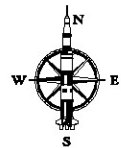
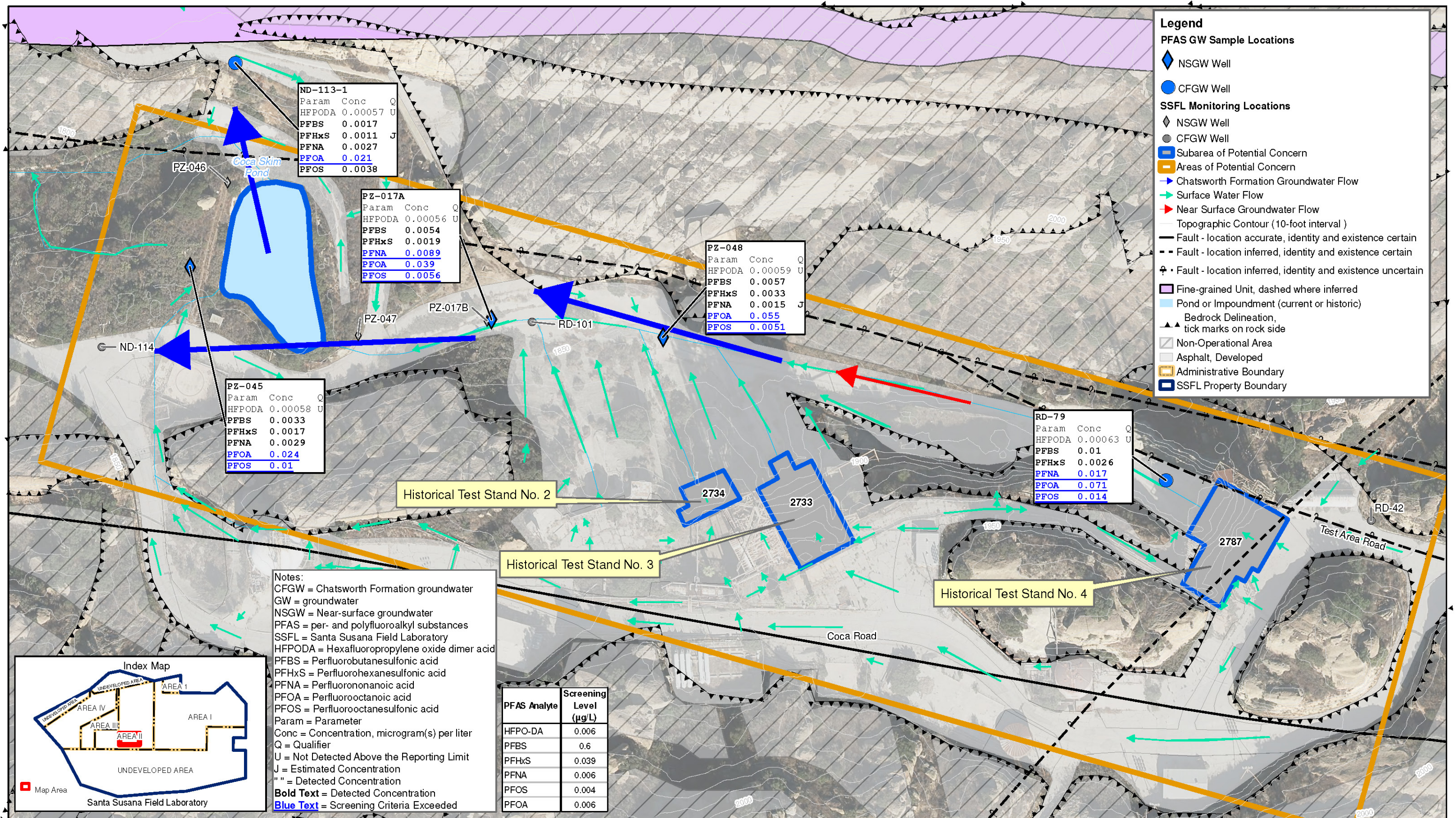


Figure 2-10
 Summary of PFAS Results in Soil: Bravo Test Stands, Alfa-Bravo Skim Pond, and Bravo Skim Pond
 Site Inspection Report of Per- and Polyfluoroalkyl Substances in Soil and Groundwater
 Santa Susana Field Laboratory
 Ventura County, California



12-Jun-2023
 Drawn By:
 Erin Epling



Legend

PFAS GW Sample Locations

- ◆ NSGW Well
- CFGW Well

SSFL Monitoring Locations

- ◆ NSGW Well
- CFGW Well
- ▭ Subarea of Potential Concern
- ▭ Areas of Potential Concern
- ➔ Chatsworth Formation Groundwater Flow
- ➔ Surface Water Flow
- ➔ Near Surface Groundwater Flow
- Topographic Contour (10-foot interval)
- Fault - location accurate, identity and existence certain
- - - Fault - location inferred, identity and existence certain
- ⊕ Fault - location inferred, identity and existence uncertain
- ▭ Fine-grained Unit, dashed where inferred
- ▭ Pond or Impoundment (current or historic)
- ▭ Bedrock Delineation, tick marks on rock side
- ▭ Non-Operational Area
- ▭ Asphalt, Developed
- ▭ Administrative Boundary
- ▭ SSFL Property Boundary

ND-113-1

Param	Conc	Q
HFPODA	0.00057	U
PFBS	0.0017	J
PFHxS	0.0011	J
PFNA	0.0027	J
PFOA	0.021	J
PFOS	0.0038	J

PZ-017A

Param	Conc	Q
HFPODA	0.00056	U
PFBS	0.0054	J
PFHxS	0.0019	J
PFNA	0.0089	J
PFOA	0.039	J
PFOS	0.0056	J

PZ-048

Param	Conc	Q
HFPODA	0.00059	U
PFBS	0.0057	J
PFHxS	0.0033	J
PFNA	0.0015	J
PFOA	0.055	J
PFOS	0.0051	J

PZ-045

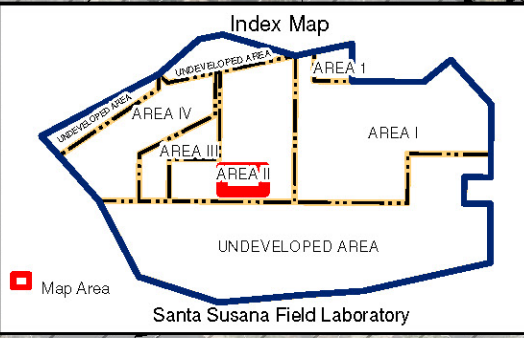
Param	Conc	Q
HFPODA	0.00058	U
PFBS	0.0033	J
PFHxS	0.0017	J
PFNA	0.0029	J
PFOA	0.024	J
PFOS	0.01	J

RD-79

Param	Conc	Q
HFPODA	0.00063	U
PFBS	0.01	J
PFHxS	0.0026	J
PFNA	0.017	J
PFOA	0.071	J
PFOS	0.014	J

Notes:
 CFGW = Chatsworth Formation groundwater
 GW = groundwater
 NSGW = Near-surface groundwater
 PFAS = per- and polyfluoroalkyl substances
 SSFL = Santa Susana Field Laboratory
 HFPODA = Hexafluoropropylene oxide dimer acid
 PFBS = Perfluorobutanesulfonic acid
 PFHxS = Perfluorohexanesulfonic acid
 PFNA = Perfluorononanoic acid
 PFOA = Perfluorooctanoic acid
 PFOS = Perfluorooctanesulfonic acid
 Param = Parameter
 Conc = Concentration, microgram(s) per liter
 Q = Qualifier
 U = Not Detected Above the Reporting Limit
 J = Estimated Concentration
 " " = Detected Concentration
Bold Text = Detected Concentration
Blue Text = Screening Criteria Exceeded

PFAS Analyte	Screening Level (µg/L)
HFPO-DA	0.006
PFBS	0.6
PFHxS	0.039
PFNA	0.006
PFOS	0.004
PFOA	0.006



22-May-2023
 Drawn By:
 Erin Epling

FIGURE 2-11
 Summary of PFAS Results in Groundwater: Coca Test Stands and Coca Skim Pond
 Site Inspection Report of Per- and Polyfluoroalkyl Substances in Soil and Groundwater
 Santa Susana Field Laboratory
 Ventura County, California

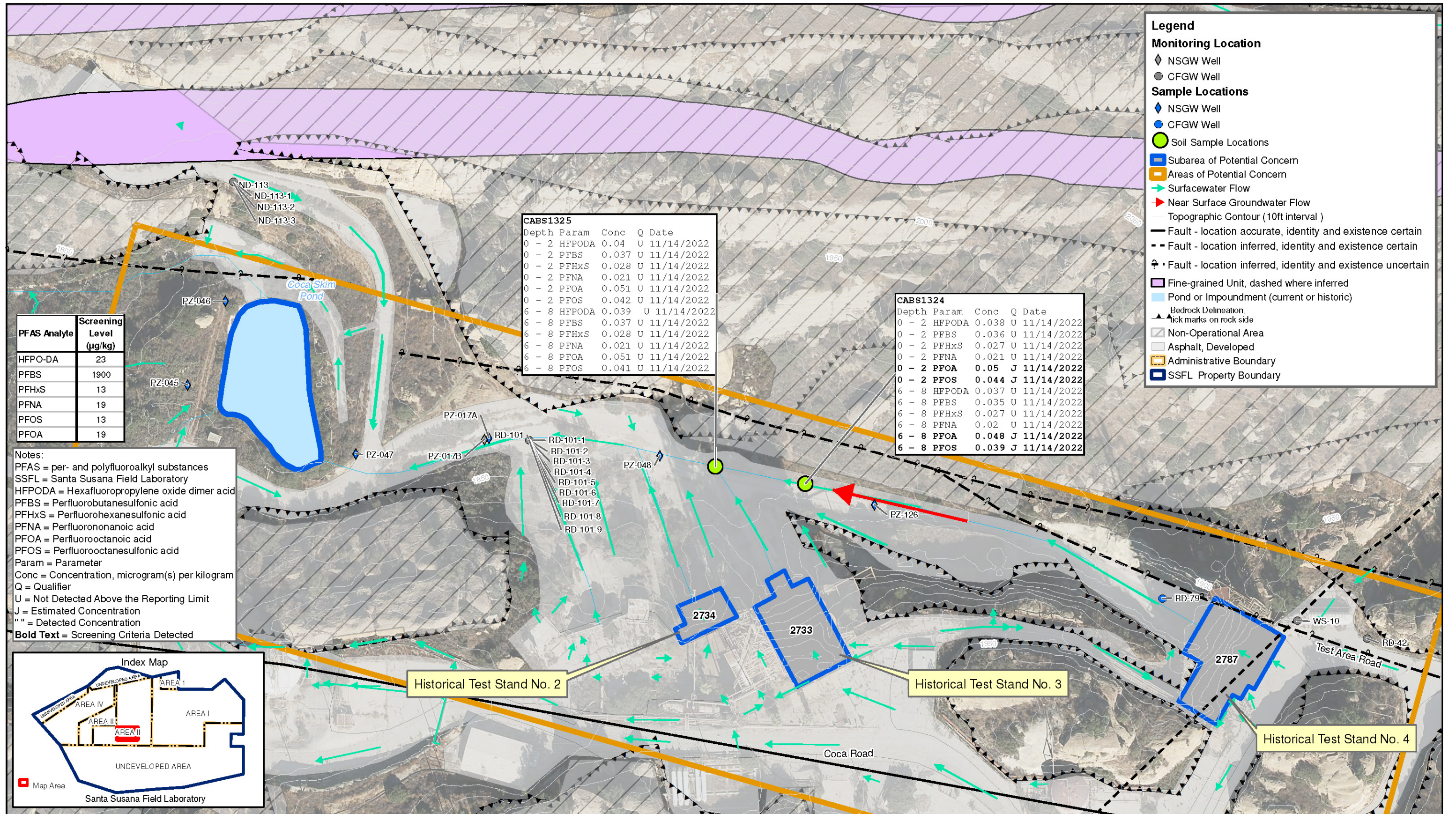
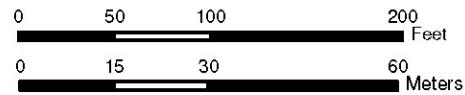
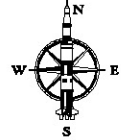
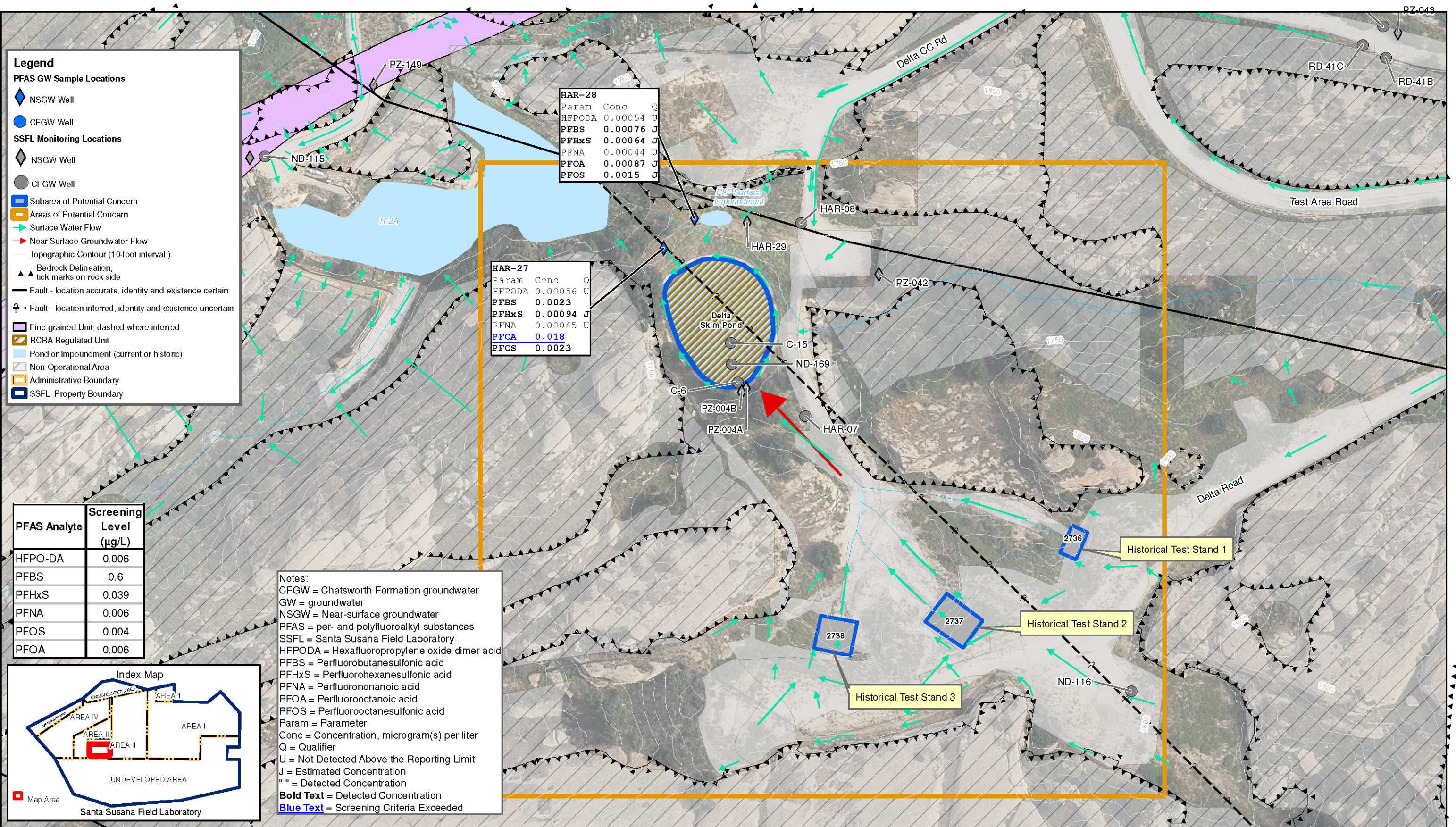


FIGURE 2-12
 Summary of PFAS Results in Soil: Coca Test Stands and Coca Skim Pond
 Site Inspection Report of Per- and Polyfluoroalkyl Substances in Soil and Groundwater
 Santa Susana Field Laboratory
 Ventura County, California



12-Jun-2023
 Drawn By:
 Erin Epling



Legend

PFAS GW Sample Locations

- ◆ NSGW Well
- CFGW Well

SSFL Monitoring Locations

- ◆ NSGW Well
- CFGW Well

- Subarea of Potential Concern
- Areas of Potential Concern
- Surface Water Flow
- Near Surface Groundwater Flow
- Topographic Contour (10-foot interval)
- ▲ Bedrock Delineation, tick marks on rock side
- Fault - location accurate, identity and existence certain
- ⊕ Fault - location inferred, identity and existence uncertain
- ▨ Fine-grained Unit, dashed where inferred
- ▨ RCRA Regulated Unit
- Pond or Impoundment (current or historic)
- Non-Operational Area
- Administrative Boundary
- SSFL Property Boundary

HAR-28

Param	Conc	Q
HFPODA	0.00054	U
PFBS	0.00076	J
PFHxS	0.00064	J
PFNA	0.00044	U
PFOA	0.00087	J
PFOS	0.0015	J

HAR-27

Param	Conc	Q
HFPODA	0.00056	U
PFBS	0.0023	J
PFHxS	0.00094	J
PFNA	0.00045	U
PFOA	0.018	J
PFOS	0.0023	J

PFAS Analyte	Screening Level (µg/L)
HFPO-DA	0.006
PFBS	0.6
PFHxS	0.039
PFNA	0.006
PFOS	0.004
PFOA	0.006

Notes:
 CFGW = Chatsworth Formation groundwater
 GW = groundwater
 NSGW = Near-surface groundwater
 PFAS = per- and polyfluoroalkyl substances
 SSFL = Santa Susana Field Laboratory
 HFPODA = Hexafluoropropylene oxide dimer acid
 PFBS = Perfluorobutanesulfonic acid
 PFHxS = Perfluorohexanesulfonic acid
 PFNA = Perfluorononanoic acid
 PFOA = Perfluorooctanoic acid
 PFOS = Perfluorooctanesulfonic acid
 Param = Parameter
 Conc = Concentration, microgram(s) per liter
 Q = Qualifier
 U = Not Detected Above the Reporting Limit
 J = Estimated Concentration
 " " = Detected Concentration
Bold Text = Detected Concentration
Blue Text = Screening Criteria Exceeded

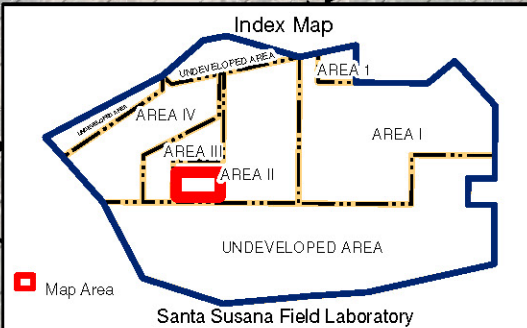
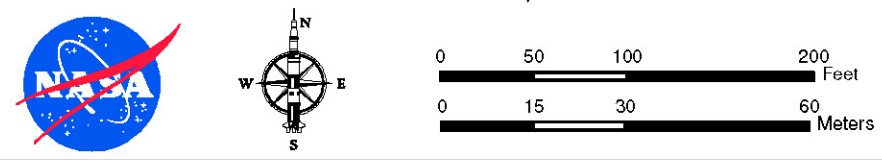


FIGURE 2-13
 Summary of PFAS Results in Groundwater: Delta Test Stands and Delta Skim Pond
 Site Inspection Report of Per- and Polyfluoroalkyl Substances in Soil and Groundwater
 Santa Susana Field Laboratory
 Ventura County, California



22-May-2023
 Drawn By:
 Erin Epling

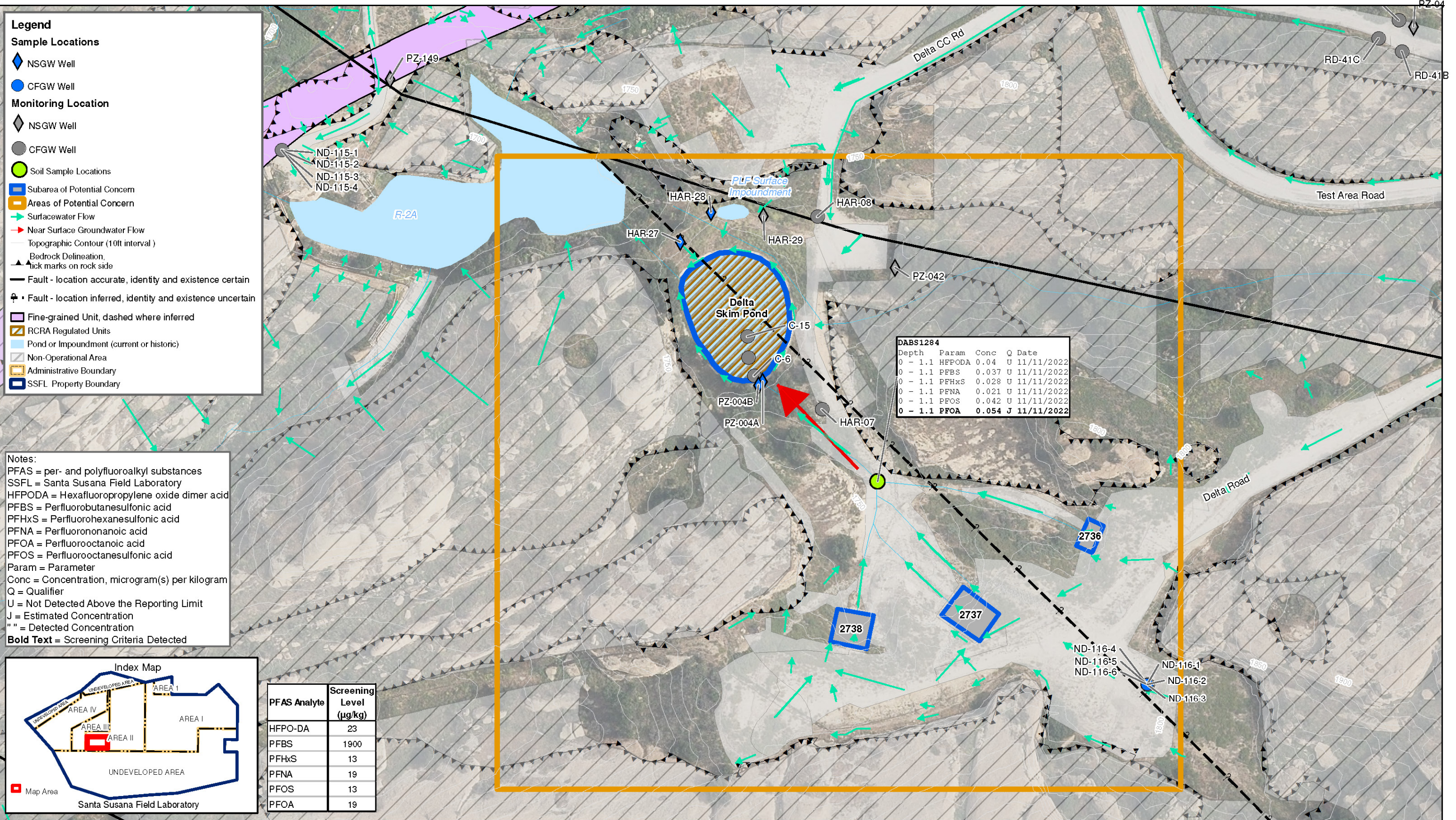
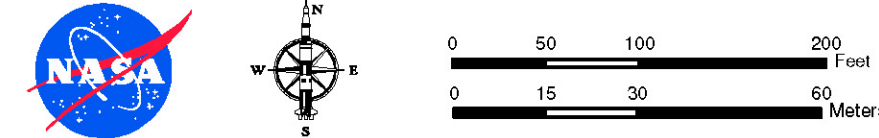


FIGURE 2-14
 Summary of PFAS Results in Soil: Delta Test Stands and Delta Skim Pond
 Site Inspection Report of Per- and Polyfluoroalkyl Substances in Soil and Groundwater
 Santa Susana Field Laboratory
 Ventura County, California



12-Jun-2023
 Drawn By:
 Erin Epling

Appendix A
Soil Boring Logs

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PROJECT NUMBER: D3498300	BORING NUMBER: A2BS1243	SHEET 1 OF 1
<h2>Soil Boring Log</h2>		

PROJECT : NASA SSFL CJ063 PFAS Site Inspection LOCATION : 5800 Woolsey Canyon Road, Canoga Park, California
 ELEVATION : N/A DRILLING CONTRACTOR AND DRILL RIG : EST Inc., Geoprobe Rig
 COORDINATES : DRILLING METHOD AND EQUIPMENT : Hand Auger 2" Diameter
 WATER LEVEL : NA START : 11/9/2022 END : 11/9/2022 LOGGED BY : R. Lucich

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	SAMPLE TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS	BACKFILL GRAPHIC	BOREHOLE BACKFILL DETAIL
8	8	HA	N/A		SANDY SILT (ML) brown (10YR 5/3), slightly moist, soft, no plasticity, sand is fine-grained, lithics, 20% sand, 80% fines yellowish brown (10YR 5/4) yellowish brown (10YR 5/6)	PID = 0.0 ppm VOC (headspace) 1010 Collected: A2BS1243S001 (0-2 ft) A2BS1243D001 (0-2 ft) PID = 0.0 ppm VOC (headspace) PID = 0.0 ppm VOC (headspace) 1110 Collected: A2BS1243S002 (6-8 ft)		← Borehole backfilled with soil cuttings.
15					Boring terminated at 8.0 ft bgs.	0950 Collected: FBQW18850001 (field blank)		



PROJECT NUMBER: D3498300	BORING NUMBER: A2BS1244	SHEET 1 OF 1
Soil Boring Log		

PROJECT : NASA SSFL CJ063 PFAS Site Inspection LOCATION : 5800 Woolsey Canyon Road, Canoga Park, California
 ELEVATION : N/A DRILLING CONTRACTOR AND DRILL RIG : EST Inc., Geoprobe Rig
 COORDINATES : DRILLING METHOD AND EQUIPMENT : Hand Auger 2" Diameter
 WATER LEVEL : NA START : 11/9/2022 END : 11/9/2022 LOGGED BY : R. Lucich

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	SAMPLE TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS	BACKFILL GRAPHIC	BOREHOLE BACKFILL DETAIL
1.67	HA	N/A			SILT (ML) dark grayish brown (10YR 4/2), slightly moist, soft, no plasticity, 100% fines brown (10YR 5/3) SILTY SAND (SM) light yellowish brown (10YR 6/4), slightly moist, loose, fine to medium grained, subangular to subrounded Boring terminated at 1.7 ft bgs.	PID = 0.0 ppm VOC (headspace) 1200 Collected: A2BS1244S001 (0-1.67 ft) Refusal encountered at 1.67 ft.		← Borehole backfilled with soil cuttings.



PROJECT NUMBER: D3498300	BORING NUMBER: AABS1262	SHEET 1 OF 1
<h1>Soil Boring Log</h1>		

PROJECT : NASA SSFL CJ063 PFAS Site Inspection LOCATION : 5800 Woolsey Canyon Road, Canoga Park, California
 ELEVATION : N/A DRILLING CONTRACTOR AND DRILL RIG : EST Inc., Geoprobe Rig
 COORDINATES : DRILLING METHOD AND EQUIPMENT : Hand Auger 2" Diameter
 WATER LEVEL : NA START : 11/11/2022 END : 11/11/2022 LOGGED BY : R. Lucich

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	SAMPLE TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS	BACKFILL GRAPHIC	BOREHOLE BACKFILL DETAIL
2	HA	N/A			SANDY SILT (ML) dark brown (10YR 3/3), moist, soft, no plasticity, sand fine grained, 30% sand, 70% fines <hr/> SILTY SAND (SM) brown (10YR 5/3), dry, loose, fine grained, subangular to subrounded, 75% sand, 25% fines yellowish brown (10YR 5/4)	PID = 0.0 ppm VOC (headspace) 0850 Collected: AABS1262S001 (0-2 ft) AABS1262S001MS (0-2 ft) AABS1262S001SD (0-2 ft) PID = 0.0 ppm VOC (headspace) 0915 Collected: AABS1262S002 (4.6-6.6 ft)		← Borehole backfilled with soil cuttings.
5					SANDSTONE (SS), light yellowish brown (10YR 6/4), dry, hard, fine to medium grained Boring terminated at 6.6 ft bgs.	Refusal encountered at 6.6 ft. 0830 Collected field blank FBQW18860001		



PROJECT NUMBER: D3498300	BORING NUMBER: AABS1263	SHEET 1 OF 1
Soil Boring Log		

PROJECT : NASA SSFL CJ063 PFAS Site Inspection LOCATION : 5800 Woolsey Canyon Road, Canoga Park, California
 ELEVATION : N/A DRILLING CONTRACTOR AND DRILL RIG : EST Inc., Geoprobe Rig
 COORDINATES : DRILLING METHOD AND EQUIPMENT : Hand Auger 2" Diameter
 WATER LEVEL : NA START : 11/11/2022 END : 11/11/2022 LOGGED BY : R. Lucich

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	SAMPLE TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS	BACKFILL GRAPHIC	BOREHOLE BACKFILL DETAIL
	2.1	HA	N/A		SANDY SILT (ML) brown (10YR 5/3), moist, soft, no plasticity, sand fine grained, 35% sand, 65% fines	PID = 0.0 ppm VOC (headspace) 1010 Collected: AABS1263 (0-2.1 ft)		← Borehole backfilled with soil cuttings.
					Boring terminated at 2.1 ft bgs.	Refusal encountered at 2.1 ft.		
5								
10								
15								



PROJECT NUMBER: D3498300	BORING NUMBER: AABS1264	SHEET 1 OF 1
Soil Boring Log		

PROJECT : NASA SSFL CJ063 PFAS Site Inspection LOCATION : 5800 Woolsey Canyon Road, Canoga Park, California
 ELEVATION : N/A DRILLING CONTRACTOR AND DRILL RIG : EST Inc., Geoprobe Rig
 COORDINATES : DRILLING METHOD AND EQUIPMENT : Hand Auger 2" Diameter
 WATER LEVEL : NA START : 11/11/2022 END : 11/11/2022 LOGGED BY : R. Lucich

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	SAMPLE TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS	BACKFILL GRAPHIC	BOREHOLE BACKFILL DETAIL
	1.4	HA	N/A		SANDY SILT (ML) dark brown (10YR 3/3), moist, no plasticity, soft, brick debris, sand fine grained, 25% sand, 75% fines	PID = 0.0 ppm VOC (headspace) 1035 Collected: AABS1264S001 (0-1.4 ft)		← Borehole backfilled with soil cuttings.
					Encountered debris Boring terminated at 1.4 ft bgs.	Refusal encountered at 1.4 ft.		
5								
10								
15								



PROJECT NUMBER: D3498300	BORING NUMBER: AABS1265	SHEET 1 OF 1
Soil Boring Log		

PROJECT : NASA SSFL CJ063 PFAS Site Inspection LOCATION : 5800 Woolsey Canyon Road, Canoga Park, California
 ELEVATION : N/A DRILLING CONTRACTOR AND DRILL RIG : EST Inc., Geoprobe Rig
 COORDINATES : DRILLING METHOD AND EQUIPMENT : Hand Auger 2" Diameter
 WATER LEVEL : NA START : 11/10/2022 END : 11/10/2022 LOGGED BY : R. Lucich

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	SAMPLE TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS	BACKFILL GRAPHIC	BOREHOLE BACKFILL DETAIL
	1.8	HA	N/A		SILTY SAND (SM) brown (10YR 5/3), slightly moist, loose, fine grained, subrounded	PID = 0.0 ppm VOC (headspace) 1505 Collected: AABS1265S001 (0-1.8 ft)		← Borehole backfilled with soil cuttings.
					Boring terminated at 1.8 ft bgs.	Refusal encountered at 1.8 ft.		
5								
10								
15								



PROJECT NUMBER: D3498300	BORING NUMBER: ARBS1245	SHEET 1 OF 1
Soil Boring Log		

PROJECT : NASA SSFL CJ063 PFAS Site Inspection LOCATION : 5800 Woolsey Canyon Road, Canoga Park, California
 ELEVATION : N/A DRILLING CONTRACTOR AND DRILL RIG : EST Inc., Geoprobe Rig
 COORDINATES : DRILLING METHOD AND EQUIPMENT : Direct Push Technology 2.5" Diameter
 WATER LEVEL : NA START : 11/10/2022 END : 11/10/2022 LOGGED BY : S. Sanchez

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	SAMPLE TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS	BACKFILL GRAPHIC	BOREHOLE BACKFILL DETAIL
4	4	DPT	N/A		SANDY SILT (ML) brown (10YR 4/3), slightly moist, soft, no plasticity, 25% fine sand, 75% fines SILTY SAND (SM) yellowish brown (10YR 5/4), slightly moist, loose, fine grained, subrounded, 80% sand, 20% fines	PID = 0.0 ppm VOC (headspace) 1255 Collected: ARBS1245S001 (0-2 ft)		← Borehole backfilled with soil cuttings.
5	4	DPT	N/A		PID = 0.0 ppm VOC (headspace) 1300 Collected: ARBS1245S002 (6-8 ft)			
Boring terminated at 8.0 ft bgs.								



PROJECT NUMBER: D3498300	BORING NUMBER: ARBS1246	SHEET 1 OF 1
Soil Boring Log		

PROJECT : NASA SSFL CJ063 PFAS Site Inspection LOCATION : 5800 Woolsey Canyon Road, Canoga Park, California
 ELEVATION : N/A DRILLING CONTRACTOR AND DRILL RIG : EST Inc., Geoprobe Rig
 COORDINATES : DRILLING METHOD AND EQUIPMENT : Direct Push Technology 2.5" Diameter
 WATER LEVEL : NA START : 11/10/2022 END : 11/10/2022 LOGGED BY : R. Lucich

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	SAMPLE TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS	BACKFILL GRAPHIC	BOREHOLE BACKFILL DETAIL
4	4	DPT	N/A		SILTY SAND (SM) brown (10YR 5/3), slightly moist, loose, fine to medium grained, subrounded yellowish brown (10YR 5/4), dry, loose, fine grained, 75% sand, 25% fines	PID = 0.0 ppm VOC (headspace) 1350 Collected: ARBS1246S001 (0-2 ft)		← Borehole backfilled with soil cuttings.
5	2	DPT	N/A			PID = 0.0 ppm VOC (headspace) 1400 Collected: ARBS1246S002 (4-6 ft)		
					SANDSTONE (SS), light yellowish brown (10YR 6/4), dry, fine grained, subrounded Boring terminated at 6.0 ft bgs.	Refusal encountered at 6 ft.		



PROJECT NUMBER: D3498300	BORING NUMBER: BVBS1708	SHEET 1 OF 1
<h2>Soil Boring Log</h2>		

PROJECT : NASA SSFL CJ063 PFAS Site Inspection LOCATION : 5800 Woolsey Canyon Road, Canoga Park, California
 ELEVATION : N/A DRILLING CONTRACTOR AND DRILL RIG : EST Inc., Geoprobe Rig
 COORDINATES : DRILLING METHOD AND EQUIPMENT : Direct Push Technology 2.5" Diameter
 WATER LEVEL : NA START : 11/17/2022 END : 11/17/2022 LOGGED BY : S. Sanchez

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	SAMPLE TYPE	STANDARD PENETRATION TEST RESULTS 6"-6'-6" (N)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS	BACKFILL GRAPHIC	BOREHOLE BACKFILL DETAIL
4	4	DPT	N/A		SILTY SAND (SM) yellowish brown (10YR 5/6), dry, loose, fine to medium grained, 90% sand, 10% fines, trace mica and fine gravel, subround to subangular	PID = 0.1 ppm VOC (headspace) Collected: BVBS1708S001 (0-2 ft) BVBS1708S001MS (0-2 ft) BVBS1708S001SD (0-2 ft)		← Borehole backfilled with hydrated bentonite chips.
5					PID = 18.6 ppm VOC (headspace) Collected: BVBS1708S002 (4-6 ft)			
4	4	DPT	N/A		SANDY SILT (ML) very dark greenish gray (10BG 3/1), moist, medium dense, fine grained, 80% fines, 20% sand, micaceous			
Boring terminated at 8.0 ft bgs.								



PROJECT NUMBER: D3498300	BORING NUMBER: BVBS1709	SHEET 1 OF 1
Soil Boring Log		

PROJECT : NASA SSFL CJ063 PFAS Site Inspection LOCATION : 5800 Woolsey Canyon Road, Canoga Park, California
 ELEVATION : N/A DRILLING CONTRACTOR AND DRILL RIG : EST Inc., Geoprobe Rig
 COORDINATES : DRILLING METHOD AND EQUIPMENT : Hand Auger 2" Diameter
 WATER LEVEL : NA START : 11/17/2022 END : 11/17/2022 LOGGED BY : S. Sanchez

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	SAMPLE TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS	BACKFILL GRAPHIC	BOREHOLE BACKFILL DETAIL
	1.8	HA	N/A		POORLY GRADED SAND (SP) brown (10YR 4/3), dry, loose, fine to medium grained, subrounded to subangular, 95% sand, 5% fines, trace mica	PID = 0.0 ppm VOC (headspace) Collected: BVBS1709S001 (0-1.8 ft)		← Borehole backfilled with soil cuttings.
					Boring terminated at 1.8 ft bgs.	Refusal encountered at 1.8 ft.		
5								
10								
15								



PROJECT NUMBER: D3498300	BORING NUMBER: CABS1324	SHEET 1 OF 1
<h2>Soil Boring Log</h2>		

PROJECT : NASA SSFL CJ063 PFAS Site Inspection LOCATION : 5800 Woolsey Canyon Road, Canoga Park, California
 ELEVATION : N/A DRILLING CONTRACTOR AND DRILL RIG : EST Inc., Geoprobe Rig
 COORDINATES : DRILLING METHOD AND EQUIPMENT : Direct Push Technology 2.5" Diameter, Corer 5" Diameter
 WATER LEVEL : NA START : 11/14/2022 END : 11/14/2022 LOGGED BY : S. Sanchez

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	SAMPLE TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS	BACKFILL GRAPHIC	BOREHOLE BACKFILL DETAIL
3.5	DPT	N/A			CONCRETE 6" thick	PID = 0.0 ppm VOC (headspace) Collected: CABS1324S001 (0-2 ft)		Surface completed with concrete.
					SILTY SAND (SM) dark yellowish brown (10YR 4/4), dry, loose, fine to medium grained, subangular to subrounded, 80% sand, 20% fines, trace mica			Borehole backfilled with soil cuttings.
5					POORLY GRADED SAND (SP) light olive brown (2.5Y 5/4), dry, medium dense, fine grained, subangular to subrounded, 90% sand, 10% fines, trace mica			
4	DPT	N/A			SILTY SAND (SM) dark yellowish brown (10YR 3/4), moist, medium dense, fine to medium grained, 70% sand, 30% fines, trace mica	PID = 0.0 ppm VOC (headspace) Collected: CABS1324S002 (6-8 ft)		
Boring terminated at 8.0 ft bgs.								



PROJECT NUMBER: D3498300	BORING NUMBER: CABS1325	SHEET 1 OF 1
<h2>Soil Boring Log</h2>		

PROJECT : NASA SSFL CJ063 PFAS Site Inspection LOCATION : 5800 Woolsey Canyon Road, Canoga Park, California
 ELEVATION : N/A DRILLING CONTRACTOR AND DRILL RIG : EST Inc., Geoprobe Rig
 COORDINATES : DRILLING METHOD AND EQUIPMENT : Direct Push Technology 2.5" Diameter, Corer 5" Diameter
 WATER LEVEL : NA START : 11/14/2022 END : 11/14/2022 LOGGED BY : S. Sanchez

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	SAMPLE TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS	BACKFILL GRAPHIC	BOREHOLE BACKFILL DETAIL
0.7	CORE	N/A			CONCRETE 8" thick			Surface completed with concrete.
3.3	DPT	N/A			POORLY GRADED SAND WITH SILT (SP-SM) very dark greenish gray (10BG 3/1), dry, loose to medium dense, fine grained, 90% sand, 10% fines, micaceous	PID = 0.0 ppm VOC (headspace) Collected: CABS1325S001 (0-2 ft)		Borehole backfilled with soil cuttings.
4	DPT	N/A			SILTY SAND (SM) dark greenish gray (10BG 4/1), dry, medium dense, fine grained, subangular to subrounded, 80% sand, 20% fines, trace mica	PID = 0.0 ppm VOC (headspace) Collected: CABS1325S002 (6-8 ft)		
Boring terminated at 8.0 ft bgs.								



PROJECT NUMBER: D3498300	BORING NUMBER: DABS1284	SHEET 1 OF 1
Soil Boring Log		

PROJECT : NASA SSFL CJ063 PFAS Site Inspection LOCATION : 5800 Woolsey Canyon Road, Canoga Park, California

ELEVATION : N/A DRILLING CONTRACTOR AND DRILL RIG : EST Inc., Geoprobe Rig

COORDINATES : DRILLING METHOD AND EQUIPMENT : Hand Auger 2" Diameter

WATER LEVEL : NA START : 11/11/2022 END : 11/11/2022 LOGGED BY : R. Lucich

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	SAMPLE TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS	BACKFILL GRAPHIC	BOREHOLE BACKFILL DETAIL
	1.1	HA	N/A		SILTY SAND (SM) yellowish brown (10YR 5/4), slightly moist, loose, fine to medium grained, subangular to subrounded, 80% sand, 20% fines	PID = 0.0 ppm VOC (BZ) 1325 Collected: DABS1284S001 (0-1.1 ft)		← Borehole backfilled with soil cuttings.
					Boring terminated at 1.1 ft bgs.	Refusal encountered at 1.1 ft.		
5								
10								
15								



PROJECT NUMBER: D3498300	BORING NUMBER: EVBS2000	SHEET 1 OF 1
Soil Boring Log		

PROJECT : NASA SSFL CJ063 PFAS Site Inspection LOCATION : 5800 Woolsey Canyon Road, Canoga Park, California
 ELEVATION : N/A DRILLING CONTRACTOR AND DRILL RIG : EST Inc., Geoprobe Rig
 COORDINATES : DRILLING METHOD AND EQUIPMENT : Direct Push Technology 2.5" Diameter
 WATER LEVEL : NA START : 11/17/2022 END : 11/17/2022 LOGGED BY : S. Sanchez

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	SAMPLE TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS	BACKFILL GRAPHIC	BOREHOLE BACKFILL DETAIL
	2	DPT	N/A		WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM) dark yellowish brown (10YR 3/4), loose to medium dense, fine to coarse grained, fine to medium gravel, subrounded to subangular, 70% sand, 20% gravel, 10% fines	PID = 0.0 ppm VOC (headspace) Collected: EVBS2000S001 (0-2 ft) EVBS2000D001 (0-2 ft)		← Borehole backfilled with soil cuttings.
					Boring terminated at 2.0 ft bgs.	Refusal encountered at 2 ft.		
5								
10								
15								



PROJECT NUMBER: D3498300	BORING NUMBER: EVBS2001	SHEET 1 OF 1
Soil Boring Log		

PROJECT : NASA SSFL CJ063 PFAS Site Inspection LOCATION : 5800 Woolsey Canyon Road, Canoga Park, California

ELEVATION : N/A DRILLING CONTRACTOR AND DRILL RIG : EST Inc., Geoprobe Rig

COORDINATES : DRILLING METHOD AND EQUIPMENT : Hand Auger 2" Diameter

WATER LEVEL : NA START : 11/17/2022 END : 11/17/2022 LOGGED BY : S. Sanchez

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	SAMPLE TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS	BACKFILL GRAPHIC	BOREHOLE BACKFILL DETAIL
1.6	HA	N/A			SM (SM) dark yellowish brown (10YR 4/6), dry, loose, fine grained, 80% sand, 20% fines, trace mica	PID = 0.0 ppm VOC (headspace) Collected: EVBS2001S001 (0-1.6 ft)		← Borehole backfilled with soil cuttings.
Boring terminated at 1.6 ft bgs.					Refusal encountered at 1.6 ft.			
5								
10								
15								



PROJECT NUMBER: D3498300	BORING NUMBER: EVBS2002	SHEET 1 OF 1
Soil Boring Log		

PROJECT : NASA SSFL CJ063 PFAS Site Inspection LOCATION : 5800 Woolsey Canyon Road, Canoga Park, California
 ELEVATION : N/A DRILLING CONTRACTOR AND DRILL RIG : EST Inc., Geoprobe Rig
 COORDINATES : DRILLING METHOD AND EQUIPMENT : Hand Auger 2" Diameter
 WATER LEVEL : NA START : 11/17/2022 END : 11/17/2022 LOGGED BY : S. Sanchez

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	SAMPLE TYPE	STANDARD PENETRATION TEST RESULTS 6"-6'-6" (N)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS	BACKFILL GRAPHIC	BOREHOLE BACKFILL DETAIL
	0.75	HA	N/A		SILTY SAND (SM) dark yellowish brown (10YR 4/6), dry, loose, fine grained, 80% sand, 20% fines, trace mica Boring terminated at 0.8 ft bgs.	PID = 0.0 ppm VOC (headspace) Collected: EVBS2002S001 (0-0.75 ft) Refusal encountered at 0.75 ft.		← Borehole backfilled with soil cuttings.
5								
10								
15								



PROJECT NUMBER: D3498300	BORING NUMBER: EVBS2003	SHEET 1 OF 1
Soil Boring Log		

PROJECT : NASA SSFL CJ063 PFAS Site Inspection LOCATION : 5800 Woolsey Canyon Road, Canoga Park, California

ELEVATION : N/A DRILLING CONTRACTOR AND DRILL RIG : EST Inc., Geoprobe Rig

COORDINATES : DRILLING METHOD AND EQUIPMENT : Direct Push Technology 2.5" Diameter

WATER LEVEL : NA START : 11/10/2022 END : 11/10/2022 LOGGED BY : R. Lucich

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	SAMPLE TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS	BACKFILL GRAPHIC	BOREHOLE BACKFILL DETAIL
	2	DPT	N/A		SILTY SAND (SM) brown (10YR 4/3), moist, loose, fine grained, 80% sand, 20% fines pale brown (10YR 6/3), slightly moist, loose, fine grained, 80% sand, 20% fines light yellowish brown (10YR 6/4), dry, loose, fine grained, 80% sand, 20% fines	PID = 0.0 ppm VOC (headspace) 0945 Collected: EVBS2003S001		← Borehole backfilled with soil cuttings.
					SILTSTONE (SLST) , light yellowish brown (10YR 6/4), dry, hard, 100% fines Boring terminated at 2.0 ft bgs.	Refusal encountered at 2 ft.		
5								
10								
15								



PROJECT NUMBER: D3498300	BORING NUMBER: EVBS2004	SHEET 1 OF 1
<h2>Soil Boring Log</h2>		

PROJECT : NASA SSFL CJ063 PFAS Site Inspection LOCATION : 5800 Woolsey Canyon Road, Canoga Park, California

ELEVATION : N/A DRILLING CONTRACTOR AND DRILL RIG : EST Inc., Geoprobe Rig

COORDINATES : DRILLING METHOD AND EQUIPMENT : Direct Push Technology 2.5" Diameter

WATER LEVEL : NA START : 11/10/2022 END : 11/10/2022 LOGGED BY : R. Lucich

DEPTH BELOW GROUND SURFACE (ft)	RECOVERY (ft)	SAMPLE TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	GRAPHIC LOG	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS	BACKFILL GRAPHIC	BOREHOLE BACKFILL DETAIL
4	DPT	N/A	N/A		SILTY SAND (SM) brown (10YR 5/3), slightly moist, loose, fine to medium grained	PID = 0.0 ppm VOC (headspace)		← Borehole backfilled with soil cuttings.
					SANDY SILT (ML) yellowish brown (10YR 5/4), dry, soft, 20% fine sand, 80% fines, no plasticity	1055 Collected: EVBS2004S001 (0-2 ft)		
0.5	DPT	N/A	N/A	SILT (ML) grayish brown (10YR 5/2), dry, 100% fines, slightly fissile	PID = 0.0 ppm VOC (headspace) 1100 Collected: EVBS2004S002			
5	Boring terminated at 4.5 ft bgs.				Refusal encountered at 4.5 ft.			

Appendix B

Data Usability Assessment Reports

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**Site Inspection of Per- and Polyfluoroalkyl Substances in
Groundwater
Data Usability Assessment Report**

March 2023

Prepared for
**National Aeronautics and Space Administration
Santa Susana Field Laboratory, Ventura County, California**

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Site Inspection of Per- and Polyfluoroalkyl Substances in Groundwater
Data Usability Assessment Report

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Acronyms and Abbreviations

Acronym	Definition
EPA	U.S. Environmental Protection Agency
FD	field duplicate
QAPP	Quality Assurance Project Plan
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
MDL	method detection limit
MRL	method reporting limit
MS	matrix spike
MSD	matrix spike duplicate
NASA	National Aeronautics and Space Administration
PARCCS	precision, accuracy, representativeness, completeness, comparability, and sensitivity
PFAS	per- and polyfluoroalkyl substances
QC	quality control
RPD	relative percent difference
SDG	sample delivery group
SSFL	Santa Susana Field Laboratory

Site Inspection of Per- and Polyfluoroalkyl Substances in Groundwater
Data Usability Assessment Report

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1. Introduction

The objective of this data usability assessment report is to assess the data quality of analytical results for groundwater samples collected during the site inspection procedure activities at the National Aeronautics and Space Administration (NASA) Santa Susana Field Laboratory (SSFL) in Ventura County, California. Samples were collected and analyzed to evaluate the presence or absence of per- and polyfluoroalkyl substances (PFAS) in groundwater near and/or within the areas of potential concern. The data may also be used to support future activities such as feasibility studies, risk assessments, fate-and-transport modeling, and remedial actions.

Individual method requirements and guidelines from the *Quality Assurance Project Plan, Santa Susana Field Laboratory, RCRA Facility Investigation, Surficial Media Operable Unit (SSFL QAPP) (MECx 2013)* as well as the QAPP Addendum (NASA 2022) were used in this assessment. The SSFL QAPP and QAPP Addendum include the quality assurance/quality control (QC) procedures to confirm the quality of field and laboratory data and to evaluate that the project work meets the data quality objectives for the intended use of the data for NASA SSFL site inspection procedures. This report is intended as a general data quality evaluation designed to summarize data issues and to provide an overall data usability assessment.

Site Inspection of Per- and Polyfluoroalkyl Substances in Groundwater
Data Usability Assessment Report

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2. Analytical Data

This data usability assessment report covers 25 environmental groundwater samples, 3 groundwater field duplicate (FD) samples, 6 ambient blanks, and 16 field equipment blanks. These samples were reported under six sample delivery groups (SDGs) by the laboratory. Samples were collected between May 23 and July 29, 2022. One method was used to analyze the environmental samples and is listed in Table 2-1. The analysis was performed by Eurofins TestAmerica in West Sacramento, California. Samples were collected and delivered by overnight carrier to the laboratory.

The chains of custody and case narratives associated with each of the laboratory SDGs are included in the laboratory data summary reports provided in Appendix A to this report. The data validation summary reports associated with each of these SDGs are provided in Appendix B.

All the data were evaluated on an SDG-by-SDG basis by CH2M HILL chemists for data quality using Level V validation, as specified in the SSFL QAPP (MECx 2013). The data evaluation included a review of the following information:

- Chain-of-custody documentation
- Holding time compliance
- Required QC samples at the specified frequencies
- Flagging for analytical blanks
- Laboratory control sample/laboratory control sample duplicates (LCS/LCSD)
- Surrogate spike recoveries for organic analyses
- Matrix spike/matrix spike duplicate (MS/MSD) recoveries
- Other method-specific criteria as defined by the SSFL QAPP or QAPP Addendum

Field samples also were reviewed to determine field compliance and data quality issues. This review included field blanks and FDs.

Data flags were assigned according to the SSFL QAPP (MECx 2013). These flags, as well as the reason for each flag, are uploaded into the NASA electronic database and are included in the data validation summary reports (provided in Appendix B). Multiple flags are routinely applied to specific sample method/matrix/analyte combinations, but there will be only one final flag. A final flag is applied to the data and is the most conservative of the applied validation flags. The final flag also includes matrix and blank sample impacts. The data flags are those listed in the SSFL QAPP and are defined as follows:

- J = Analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample (estimated).
- R = Data are unusable. The sample results are rejected because of serious deficiencies in the ability to analyze the sample and to meet QC criteria. The presence or absence of the analyte cannot be verified.
- U = Analyte was analyzed for but not detected above the reported sample quantitation limit, or this analyte was considered not detected because of laboratory or field blank contamination.
- UJ = Analyte was analyzed for but not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- N = Analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
- S = Screening level data only; the associated numerical value represents its approximate concentration.

Site Inspection of Per- and Polyfluoroalkyl Substances in Groundwater
Data Usability Assessment Report

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3. Findings

The following sections provide overall summaries of the data validation findings. Specific analyte results and samples that were qualified are discussed in the data validation summary reports (Appendix B).

3.1 Calibration

Level V validation, as defined in the SSFL QAPP (MECx 2013), does not include review of initial or continuing calibration information. The laboratories did not report any criteria exceedances in the case narrative.

3.2 Holding Times

Analytical holding times were evaluated against the criteria listed in Table B-3 of the QAPP Addendum (NASA 2022). For methods requiring both sample preparation and analysis, the preparation/extraction holding time will be calculated from the time of sampling to the initiation of preparation/extraction. The analysis holding time will be calculated from the time of completion of preparation/extraction to the time of completion of the analysis, including any required dilutions, confirmation analysis, and reanalysis. Holding times were met.

3.3 Analytical Blanks

Method blanks are used to monitor each preparation and/or analytical batch for interference and/or contamination from glassware, reagents, and other potential contaminant sources within the laboratory. A method blank is an analyte-free matrix (laboratory reagent water for aqueous samples) to which all reagents are added in the same amount or proportions as are added to samples. It is processed through the entire sample preparation and analytical procedures along with the samples in the batch. At least one method blank is prepared for each analytical batch of 20 samples or fewer.

Method blanks were analyzed at the required frequency and frequency and were generally free of contamination that would affect the sample results, with the exceptions listed in Table 3-1.

Data qualification flags were applied to the individual results as indicated in Section 2. One associated detected sample concentration was less than 5 times the blank concentration and was qualified as nondetect and flagged "U." Overall, the blank qualification was considered to be acceptable; therefore, the data are usable.

3.4 Field Blanks

Field blanks (ambient blanks) and equipment rinse blanks are collected to monitor interference and/or contamination from potential sources associated with field collection activities. Ambient blanks were collected each week for this sampling event. The first ambient blank was collected during sampling of the first well of this event, and subsequent ambient blanks were collected at separate areas of potential concern at the discretion of the Field Team Leader. The laboratory-grade PFAS-free water was directly poured into the sample containers. Equipment rinse blanks were collected for each type of nondedicated sampling equipment and each type of dedicated tubing used for the sampling event. One equipment blank was collected from portable pump and water level meter probe each day. The laboratory-grade

PFAS-free water was placed into a decontaminated or new container or bag consisting of approved material. The pump and water level meter probe were placed into the water, and the pump was operated to fill the sample containers. One blank from each type of new tubing was also collected to evaluate potential PFAS contamination from the manufacturer. The laboratory-grade PFAS-free water was poured over/into the tubing and into the sample containers. Ambient blanks and equipment rinsate blanks were collected and analyzed at the required frequency and were free of contamination that would affect the sample results.

3.5 Field Duplicates

An FD, or collocated sample, is an independent sample collected as close as possible to the original sample from the same source under identical conditions. FDs are to be collected in the field for 5% or more of the samples collected for analysis during each sampling event, by matrix and method, and are used to document sampling and analytical precision and representativeness. Precision is expressed in terms of the relative percent difference (RPD) between the native and FD sample results. The RPD criterion for FDs for waters is 35%. Qualification is performed on the native sample and associated FD results in accordance with the SSFL QAPP (MECx 2013). FDs were collected and analyzed at the required frequency and precision criteria were acceptable.

3.6 Matrix Spike Samples

A sample matrix fortified with known quantities of specific compounds is called a “matrix spike.” It is subjected to the same preparation and analytical procedures as the native sample. The results of MS/MSD analyses provide information about the possible influence of the matrix on either the accuracy or precision of the measurements. Samples used for MS/MSD analysis were either collected in the field for 5% of the samples collected for analysis during each sampling event, by matrix and method, or were reported by the laboratory as part of their analytical batch requirements. Qualification of sample results because of MS/MSD recovery or precision exceedances was done on a sample batch basis for inorganic methods and on the parent sample only for organic methods in accordance with the SSFL QAPP (MECx 2013). Accuracy and precision criteria are listed in Table B-4 of the QAPP Addendum (NASA 2022).

Accuracy and precision limits were generally met, with the exception listed in Table 3-2.

Data qualification flags were applied to the individual results as indicated in Section 2. One detected result was qualified as estimated and flagged “J.” Sample results that have been qualified as estimated due to accuracy or precision criteria are usable for project decisions; however, data users should consider the impact to any result that is qualified as estimated because it may contain a bias and should be considered during the decision-making process.

3.7 Surrogates

Surrogates, or extracted internal standards, are organic analytes that behave similarly to the analytes of interest or have been chemically altered (that is, chemically deuterated), but are not expected to occur naturally in the samples. They are spiked into the standards, field samples, and laboratory QC samples prior to sample preparation. The results of surrogate spikes provide additional information about the possible influence of the matrix on the accuracy of the measurements for organic analyses only. Accuracy criteria are listed in Table B-4 of the QAPP Addendum (NASA 2022).

Accuracy limits were generally met, with the exception listed in Table 3-3.

Data qualification flags were applied to the individual results as indicated in Section 2. Two detected results were qualified as estimated and flagged "J," and four nondetected results were qualified as estimated and flagged "UJ." Sample results that have been qualified as estimated due to accuracy criteria are usable for project decisions; however, data users should consider the impact to any result that is qualified as estimated because it may contain a bias and should be considered during the decision-making process.

3.8 Laboratory Control Samples

LCSs are used to monitor method performance for a given analyte in each matrix. An LCS is an analyte-free matrix (laboratory reagent water for aqueous samples or Ottawa sand for soil samples) spiked with known amounts of analytes that come from a source different than that used for calibration standards. Target analytes specified in the QAPP Addendum are spiked into the LCS. It is processed through the entire sample preparation and analytical procedures along with the samples in the batch. At least one LCS is prepared for each analytical batch of 20 samples or fewer. Accuracy and precision criteria are listed in Table B-4 of the QAPP Addendum (NASA 2022). LCSs and LCSDs were analyzed at the required frequency. Accuracy and precision limits were met.

3.9 Laboratory Duplicates

A laboratory duplicate is a separate sample aliquot that is subjected to the same preparation and analytical procedures as the native sample. Laboratory duplicates were analyzed to measure the precision of sample results reported as required by the analytical method. Precision is expressed in terms of the RPD between the native and laboratory duplicate sample results. The RPD criterion for laboratory duplicates is 20%. Laboratory duplicates were analyzed at the required frequency, and precision criteria were acceptable.

3.10 Tentatively Identified Compounds

Tentatively identified compounds were not evaluated for any samples reported at this site.

3.11 Other

The detections of one or more PFAS in 10 samples were qualified as not detected because either the signal-to-noise ratio of greater than 10 was not met for the primary quantitation ion, or the transition ion criteria of 50 to 150% were not met. A total of 12 sample results were qualified.

The analytical results for sample ND125GW01S014 were qualified as screening level data ("S" flag) because the desired amount of purge water was not generated prior to sample collection. The water volume in the well was insufficient to properly purge the well.

3.12 Chain of Custody

No discrepancies were noted. Chain-of-custody documentation is provided in the laboratory data summary reports included in Appendix A.

3.13 Overall Assessment

The final activity in the data quality evaluation is an assessment of whether the data meet the data quality objectives. The goal of this assessment is to demonstrate that a sufficient number of representative samples were collected, and the resulting analytical data can be used to support the decision-making process. The precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS) are addressed in the SSFL QAPP (MECx 2013). The following summary highlights the data evaluation findings:

- Precision of the data was verified through the review of the field and laboratory data quality indicators that include FD, LCS/LCSD, MS/MSD, and laboratory duplicate RPDs. Precision was acceptable.
- Accuracy of the data was verified through the review of the LCS, MS/MSD, and surrogate standard recoveries, as well as the evaluation of the method blank/field blank data. Accuracy was generally acceptable, with the exception of some analytical results being qualified as estimated detected and nondetected results resulting from MS/MSD or surrogate recovery issues. Overall, 7 results out of 1,176 total results (approximately 0.6%) were qualified for accuracy exceptions. Analytical/field blank data were generally free of contamination, with one analytical result being qualified as nondetect. Overall, 1 result out of 1,176 total results (less than 0.1%) were qualified for blank contamination.
- Representativeness of the data was verified through the sample's collection, storage, and the verification of holding time compliance. All data were reported from analyses within U.S. Environmental Protection Agency (EPA) recommended holding times.
- Comparability of the data was verified through the use of standard EPA analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.
- Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as data that are not rejected for project use. The completeness goal of 90% was met for all analytes and methods, as indicated in Table 3-4. Evaluation of 100% of the chemical data was performed by using the SSFL QAPP as a guide for data quality evaluation. The overall completeness was met and no other systematic protocol errors were identified during the monitoring of the field or laboratory efforts. This outcome, along with the PARCCS evaluation, demonstrates that the overall quality of the analytical program and laboratory are sufficient to meet the project data quality objectives.
- Sensitivity is a measurement based upon the analytical instrument method reporting limits (MRLs) determined by the laboratory. The analytical reporting limits were determined based upon the completion of instrument-specific method detection limit (MDL) studies performed annually in accordance with the *Code of Federal Regulations* Title 40, Part 136, Appendix B (EPA 1984). The MRLs are generally established by multiplying the MDL by a factor of three to five as recommended by generally accepted laboratory practice and is further supported by the lowest-level analytical standard in the initial calibration process. Sensitivity is ensured through compliance with the MRLs specified in the SSFL QAPP. Any nondetect results that were reported by the laboratory, or were flagged nondetect because of blank contamination, have been evaluated against the project screening levels as discussed in the work plan.

4. References

MEC^x, LP (MEC^x). 2013. *Quality Assurance Project Plan, SSFL RFI Surficial Media Operable Unit, Revision 5*. March.

National Aeronautics and Space Administration (NASA). 2022. *Groundwater Quality Assurance Project Plan Addendum, Site Inspection of Per- and Polyfluoroalkyl Substances in Soil and Groundwater*.

U.S. Environmental Protection Agency (EPA). 1984. *Guidelines Establishing Test Procedures for the Analysis of Pollutants. Code of Federal Regulations*. Title 40, Part 136, Appendix B. Government Printing Office. Washington, D.C. March.

Site Inspection of Per- and Polyfluoroalkyl Substances in Groundwater
Data Usability Assessment Report

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Tables

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Table 2-1. Analytical Parameters by Method

SSFL NASA Site Inspection of Per- and Polyfluoroalkyl Substances in Groundwater, Data Usability Assessment, SSFL, Ventura County, California

Parameter	Method	Laboratory
PFAS	E537M	TAMC

PFAS = per- and polyfluoroalkyl substances

Table 3-1. Analytical Blank Qualification Summary

SSFL NASA Site Inspection of Per- and Polyfluoroalkyl Substances in Groundwater, Data Usability Assessment, SSFL, Ventura County, California

Method	Total Number of Samples	Total Number of Sample Results	Number of Results Flagged as Estimated Detect or Nondetect as a Result of Analytical Blank Contamination		Percentage of Qualified Results
			U Flag	J Flag	
E537M PFAS	28	1,176	1	0	<1

PFAS = per- and polyfluoroalkyl substances

Table 3-2. Matrix Spike/Matrix Spike Duplicate Qualification Summary

SSFL NASA Site Inspection of Per- and Polyfluoroalkyl Substances in Groundwater, Data Usability Assessment, SSFL, Ventura County, California

Method	Number of Native/MS/MSD Pairs	Number of Associated Native Sample Results	Number of Results Flagged as Estimated Detect or Nondetect as a Result of MS/MSD Recovery and/or Precision Exceptions		Number of Results Flagged as Rejected as a Result of MS/MSD Recovery Exceptions	Percentage of Qualified Results
			J Flag	UJ Flag		
E537M PFAS	2	84	1	0	0	1

MS/MSD = matrix spike/matrix spike duplicate

PFAS = per- and polyfluoroalkyl substances

Table 3-3. Surrogate Spike Qualification Summary

SSFL NASA Site Inspection of Per- and Polyfluoroalkyl Substances in Groundwater, Data Usability Assessment, SSFL, Ventura County, California

Method	Total Number of Samples	Total Number of Sample Results	Number of Results Flagged as Estimated Detect or Nondetect as a Result of Surrogate Spike Recovery Exceptions		Number of Results Flagged as Rejected as a Result of Surrogate Spike Recovery Exceptions	Percentage of Qualified Results
			J Flag	UJ Flag	R Flag	
E537M PFAS	28	1,176	2	4	0	<1

PFAS = per- and polyfluoroalkyl substances

Table 3-4. Site Completeness Summary

SSFL NASA Site Inspection of Per- and Polyfluoroalkyl Substances in Groundwater, Data Usability Assessment, SSFL, Ventura County, California

Method	Total Number of Samples ^[a]	Total Number of Results	Number of Qualified Results as Nondetect ^[b]		Number of Qualified Results as Estimated ^[c]		Number of Qualified Results as Rejected ^[d]		Percent Completeness	
			Number	Percent	Number	Percent	Number	Percent	Number	Percent ^[e]
E537M PFAS	28	1,176	1	0.1	7	0.6	0	0.0	1,176	100.0

^[a] Includes FD and normal samples.

^[b] Results flagged U.

^[c] Results flagged J or UJ.

^[d] Results flagged R.

^[e] Percent complete = (reported results-unusable results/reported results) multiplied by 100.

PFAS = per- and polyfluoroalkyl substances

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Appendix A
Data Summary Reports, Chains of Custody, and
Case Narratives
Available upon request

Due to file size, please contact Lori Manes, lori.manes@nasa.gov,
for a copy of the Appendix A reports.

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Appendix B

Data Validation Reports

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Appendix B. Data Validation Reports

Data validation reports presented in this appendix (as separate electronic files) were generated using a Microsoft Access-based validation tool created by CH2M HILL, Inc. (a wholly owned subsidiary of Jacobs). The reports provide a detailed summary of the data validation findings, as well as the final analytical results for each sample, including any data qualification flags that may have been applied. The qualification flag is followed by an annotated validation reason code for applying the flag. Table B-1 lists the validation reason code, a brief description of the reason code, and the corresponding Santa Susana Field Laboratory (SSFL) qualification code.

Table B-1. Validation Details

Validation Reason Code	Description	SSFL Qualification Code
>ICLinearRange	Result greater than linear calibration range	C
AB<RL	Ambient blank concentration less than RL	F
AB>MDL	Ambient blank concentration greater than the MDL	F
AB>RL	Ambient blank concentration greater than the RL	F
CCB<RL	Continuing calibration blank concentration less than RL	B
CCB>RL	Continuing calibration blank concentration exceeds RL	B
CCV<LCL	Continuing calibration recovery less than lower control limit	C
CCV<RF	SPCC exceeds RF > 0.300 criteria	R
CCV>UCL	Continuing calibration recovery greater than upper control limit	C
CF>RPD	Confirmation precision exceeded	*DVR
Coelution	Compounds were reported combined on one column	*DVR
EB<RL	Equipment blank concentration less than the RL	F
EB>MDL	Equipment blank concentration greater than the MDL	F
EB>RL	Equipment blank concentration greater than the RL	F
EMPC	Estimated maximum possible concentration	*DVR
exclude	Data not used; another value is appropriate, or data were not requested	D
FB<RL	Field blank concentration less than RL	F
FB>RL	Field blank concentration greater than the RL	F
FD>RPD	Field duplicate exceeds RPD criteria	*DVR
HTa>UCL	Analysis holding time exceeded	H
HTp>UCL	Preparation/extraction holding time exceeded	H
IC RRF	Initial calibration relative response factor below LCL	R

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Validation Reason Code	Description	SSFL Qualification Code
IC%RSD	Initial calibration RSD exceeded	C
ICB<RL	Initial calibration blank concentration less than the RL	B
ICVS<LCL	Second source verification standard recovery less than lower control limit	C
ICVS>UCL	Second source verification std. recovery greater than upper control limit	C
ImproperPres	Sample improperly preserved or handled prior to analysis	*DVR
InvalidLabFlag	Remove lab flag	(No flag)
IS<LCL	Internal standard response less than lower control limit	I
IS>UCL	Internal standard response greater than upper control limit	I
Lab Dup RPD	Lab duplicate exceeds RPD criteria	E
LB<RL	Laboratory blank contamination less than the RL	B
LB>MDL	Laboratory blank contamination greater than the MDL	B
LB>RL	Laboratory blank contamination greater than the RL	B
LCS<LCL	LCS recovery less than lower control limit	L
LCS>UCL	LCS recovery greater than upper control limit	L
LCSRPD	LCS RPD criteria exceeded	L
MS<LCL	Matrix spike recovery less than lower limit	Q
MS>UCL	Matrix spike recovery greater than upper limit	Q
MSRPD	Matrix spike RPD criteria exceedance	Q
NoLCS	No LCS in the analytical batch	L
PostSpike<LCL	Post-spike recovery less than the lower control limit	P
PostSpike>UCL	Post-spike recovery greater than the upper control limit	P
RE	Re-extraction and/or reanalysis	D
RemoveBFlag	Lab B flag removed; analyte not detected in sample	\$
SD<LCL	Matrix spike duplicate recovery criteria less than lower limit	Q
SD>UCL	Matrix spike duplicate recovery criteria greater than upper limit	Q
SerIDil>UCL	Serial Dilution %D greater than the upper control limit	A
Sur<LCL	Surrogate recovery less than lower limit	S
Sur>UCL	Surrogate recovery greater than upper limit	S
TB<RL	Trip blank concentration less than RL	T
TB>RL	Trip blank concentration greater than the RL	T

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Validation Reason Code	Description	SSFL Qualification Code
TEMP>8C	Temperature blank greater than 8 degrees Celsius	*DVR
TIC	Tentatively identified compound	(No flag)

%D = percent difference

LCL = lower control limit

LCS = laboratory control sample

LCSD = laboratory control sample duplicate

MDL = method detection limit

RF = response factor

RL = reporting limit

RPD = relative percent difference

RSD = relative standard deviation

SPCC = system performance check compound

Site Inspection of Per- and Polyfluoroalkyl Substances in Groundwater
Data Usability Assessment Report

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NASA SSFL CJ063 PFAS PO 148024177

Data Quality Evaluation

SDG 570-97487-1

Reviewer: mfesler

Method E537M

Date: 6/26/2022

Matrix WATER

Reviewed: 6/26/2022

Field Samples

Field blank association lot values: LotNumber / FieldID / SDG

NativeID	QAQC Type	Dilution	ABLotValue	EBLotValue	TBLotValue
WATER					
EBQW2393Q001	EB	1		23052201 / EBQW2393Q001 / 570-97487-1	
RD81GW01S016	N	1	23052201 / FBQW1878Q001 / 570-97487-1		
RD82GW01D005	FD	1	23052201 / FBQW1878Q001 / 570-97487-1	25052201 / EBQW2395Q001 / 570-97487-1	
RD82GW01S005	N	1	23052201 / FBQW1878Q001 / 570-97487-1	25052201 / EBQW2395Q001 / 570-97487-1	
EBQW2394Q001	EB	1			
EBQW2395Q001	EB	1		25052201 / EBQW2395Q001 / 570-97487-1	
EBQW2396Q001	EB	1		25052202 / EBQW2396Q001 / 570-97487-1	
FBQW1878Q001	AB	1	23052201 / FBQW1878Q001 / 570-97487-1		
FBQW1879Q001	AB	1	25052201 / FBQW1879Q001 / 570-97487-1		
ND126GWS013	N	1	23052201 / FBQW1878Q001 / 570-97487-1	23052201 / EBQW2393Q001 / 570-97487-1	
PZ048GWS004	N	1	25052201 / FBQW1879Q001 / 570-97487-1	25052202 / EBQW2396Q001 / 570-97487-1	
RD79GWS011	N	1	25052201 / FBQW1879Q001 / 570-97487-1	25052201 / EBQW2395Q001 / 570-97487-1	

1. Case Narrative

Items of Interest

The following items were noted: EMPC

2. Blank Summary

Field Blanks

These analytes had Blank detects: Perfluorobutanoic acid (PFBA) (EB). No flagging applied

Method Blanks

No Method Blank detects were found.

Blank

Type	Blank ID	Analyte	Result	Report Limit	Lab Flag	Units	SDG
EB	EBQW2394Q001	Perfluorobutanoic acid (PFBA)	0.37	1.7	J	ng/L	570-97487-1
EB	EBQW2395Q001	Perfluorobutanoic acid (PFBA)	0.31	1.6	J	ng/L	570-97487-1

3. Spikes and Duplicates

Field Duplicate

All acceptance criteria were met.

Laboratory Duplicates

None in this SDG

Matrix Spike

No MS's for this SDG. No SD's for this SDG. Perfluorobutanesulfonic acid (PFBS) and perfluorohexanesulfonic acid (PFHxS) in sample ND126GWS013, and perfluorohexanesulfonic acid (PFHxS) in sample RD81GW01S016 have a S:N ratio of less than 10. Results qualified as not detected and flagged "U".

<i>Matrix</i>	<i>Sample ID</i>	<i>LR Type</i>	<i>Analyte</i>	<i>Result</i>	<i>MS/MSD Qualifier*</i>	<i>Criteria</i>
WATER			<u>Perfluorobutanesulfonic acid (PFBS)</u>			
	ND126GWS013			0.44 ng/L	U	EMPC
WATER			<u>Perfluorohexanesulfonic acid (PFHxS)</u>			
	ND126GWS013			0.48 ng/L	U	EMPC
	RD81GW01S016			0.34 ng/L	U	EMPC

4. Laboratory Control Sample

All acceptance criteria were met. No spike dupes in this SDG.

5. Surrogates

These surrogates were out of control: 13C2 4:2 FTS (RD81GW01S016). Since recovery was high and sample result ND, no flagging applied.

<u>Field ID</u>	<u>LabsampleID</u>	<u>UpperLimit</u>	<u>LowerLimit</u>	<u>Result</u>	<u>Surrogate</u>
RD81GW01S016	570-97487-10	150	50	159	13C2 4:2 FTS

6. Tuning and Mass Calibration

Tuning and Mass Calibration were not examined by AutoDV.

7. Internal Standard

Internal Standard Area/Retention Time was not examined by AutoDV.

8. Calibration Information**Initial Calibration**

Initial Calibration was not examined by AutoDV.

Continuing Calibration

Continuing Calibration was not examined by AutoDV.

9. Holding Time

All acceptance criteria were met.

10. Confirmation

None for this SDG.

11. Summary**General Comments**

Field Blanks: These analytes had Blank detects: Perfluorobutanoic acid (PFBA) (EB). No flagging applied

Form I Review: No samples were excluded for dilutions or re-extractions.

Surrogates: These surrogates were out of control: 13C2 4:2 FTS (RD81GW01S016). Since recovery was high and sample result ND, no flagging applied.

Tuning and Mass Calibration: Tuning and Mass Calibration were not examined by AutoDV.

Internal Standard Area/Retention Time: Internal Standard Area/Retention Time was not examined by AutoDV.

Initial Calibration: Initial Calibration was not examined by AutoDV.

Continuing Calibration: Continuing Calibration was not examined by AutoDV.

Matrix Spike: No MS's for this SDG. No SD's for this SDG.

COC: No discrepancies were noted
VDMS4.56

Data Package Completeness Package was complete for level V validation

Forms Review/ Items of Interest

No samples were excluded for dilutions or re-extractions.

COC Review

No discrepancies were noted

Final Data Flags*

*When the data evaluation process results in multiple flags, the most severe flag becomes the final data flag. All flags are from the site-specific QAPP, except the "exclude" flag that is used to designate results that are not for risk assessment (for example, a result from a dilution where the original undiluted result is appropriate).

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: RD81GW01S016								
102FTSA	0.41	U	U	0.41	1.7		ng/L	
11CLPF3OUDSA	0.42	U	U	0.42	1.7		ng/L	
3:3 FTCA	0.37	U	U	0.37	1.7		ng/L	
42FTSA	0.31	U	U	0.31	1.7		ng/L	Sur>UCL (none)
5:3 FTCA	0.29	U	U	0.29	1.7		ng/L	
62FTSA	0.33	U	U	0.33	4.3		ng/L	
7:3 FTCA	0.48	U	U	0.48	1.7		ng/L	
82FTSA	0.54	U	U	0.54	1.7		ng/L	
9CLPF3ONSA	0.36	U	U	0.36	1.7		ng/L	
ADONA	0.44	U	U	0.44	1.7		ng/L	
HFPODA	0.6	U	U	0.6	3.5		ng/L	
NETFOSA	0.64	U	U	0.64	1.7		ng/L	
NETFOSAA	0.3	U	U	0.3	4.3		ng/L	
NETFOSE	0.63	U	U	0.63	1.7		ng/L	
NFDHA	0.54	U	U	0.54	1.7		ng/L	
NMEFOSA	0.64	U	U	0.64	1.7		ng/L	
NMEFOSAA	0.4	U	U	0.4	4.3		ng/L	
NMEFOSE	0.42	U	U	0.42	3.5		ng/L	
Perfluorobutanesulfonic acid (PFBS)	0.85	J	J	0.3	1.7		ng/L	
Perfluorobutanoic acid (PFBA)	9.9			0.21	1.7		ng/L	
Perfluorodecanesulfonic acid (PFDS)	0.48	U	U	0.48	1.7		ng/L	
Perfluorodecanoic acid (PFDA)	0.29	U	U	0.29	1.7		ng/L	
Perfluorododecanoic acid (PFDoA)	0.43	J	J	0.36	1.7		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.62	U	U	0.62	1.7		ng/L	
Perfluoroheptanoic acid (PFHpA)	3.6			0.42	1.7		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	0.34	U	J	0.33	1.7		ng/L	EMPC (U)
Perfluorohexanoic acid (PFHxA)	2.4			0.48	1.7		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.45	U	U	0.45	1.7		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.52	U	U	0.52	1.7		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.57	U	U	0.57	1.7		ng/L	
Perfluorononanoic acid (PFNA)	0.91	J	J	0.49	1.7		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.45	U	U	0.45	1.7		ng/L	
Perfluorooctanesulfonic acid (PFOS)	0.5	U	U	0.5	1.7		ng/L	
Perfluorooctanoic acid (PFOA)	6.8			0.49	1.7		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	0.44	U	U	0.44	1.7		ng/L	
Perfluoropentanoic acid (PFPeA)	4.2			0.21	1.7		ng/L	
Perfluorotetradecanoic acid (PFTeA)	0.49	J	J	0.44	1.7		ng/L	
Perfluorotridecanoic acid (PFTTrDA)	1.7			0.6	1.7		ng/L	
Perfluoroundecanoic acid (PFUnA)	0.92	J	J	0.63	1.7		ng/L	
PFEEESA	0.25	U	U	0.25	1.7		ng/L	
PFMBA	0.23	U	U	0.23	1.7		ng/L	
PFMPA	0.24	U	U	0.24	1.7		ng/L	
Field ID: RD82GW01D005								
102FTSA	0.4	U	U	0.4	1.7		ng/L	
11CLPF3OUDSA	0.41	U	U	0.41	1.7		ng/L	
3:3 FTCA	0.37	U	U	0.37	1.7		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: RD82GW01D005								
42FTSA	0.31	U	U	0.31	1.7		ng/L	
5:3 FTCA	0.28	U	U	0.28	1.7		ng/L	
62FTSA	0.33	U	U	0.33	4.3		ng/L	
7:3 FTCA	0.47	U	U	0.47	1.7		ng/L	
82FTSA	0.53	U	U	0.53	1.7		ng/L	
9CLPF3ONSA	0.36	U	U	0.36	1.7		ng/L	
ADONA	0.44	U	U	0.44	1.7		ng/L	
HFPODA	0.59	U	U	0.59	3.4		ng/L	
NETFOSA	0.64	U	U	0.64	1.7		ng/L	
NETFOSAA	0.29	U	U	0.29	4.3		ng/L	
NETFOSE	0.62	U	U	0.62	1.7		ng/L	
NFDHA	0.53	U	U	0.53	1.7		ng/L	
NMEFOSA	0.64	U	U	0.64	1.7		ng/L	
NMEFOSAA	0.4	U	U	0.4	4.3		ng/L	
NMEFOSE	0.41	U	U	0.41	3.4		ng/L	
Perfluorobutanesulfonic acid (PFBS)	0.29	U	U	0.29	1.7		ng/L	
Perfluorobutanoic acid (PFBA)	0.21	U	U	0.21	1.7		ng/L	EB<RL (none)
Perfluorodecanesulfonic acid (PFDS)	0.47	U	U	0.47	1.7		ng/L	
Perfluorodecanoic acid (PFDA)	0.28	U	U	0.28	1.7		ng/L	
Perfluorododecanoic acid (PFDoA)	0.36	U	U	0.36	1.7		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.61	U	U	0.61	1.7		ng/L	
Perfluoroheptanoic acid (PFHpA)	0.41	U	U	0.41	1.7		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	0.33	U	U	0.33	1.7		ng/L	
Perfluorohexanoic acid (PFHxA)	0.47	U	U	0.47	1.7		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.45	U	U	0.45	1.7		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.52	U	U	0.52	1.7		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.57	U	U	0.57	1.7		ng/L	
Perfluorononanoic acid (PFNA)	0.48	U	U	0.48	1.7		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.45	U	U	0.45	1.7		ng/L	
Perfluorooctanesulfonic acid (PFOS)	0.5	U	U	0.5	1.7		ng/L	
Perfluorooctanoic acid (PFOA)	0.48	U	U	0.48	1.7		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	0.44	U	U	0.44	1.7		ng/L	
Perfluoropentanoic acid (PFPeA)	0.21	U	U	0.21	1.7		ng/L	
Perfluorotetradecanoic acid (PFTeA)	0.44	U	U	0.44	1.7		ng/L	
Perfluorotridecanoic acid (PFTrDA)	0.59	U	U	0.59	1.7		ng/L	
Perfluoroundecanoic acid (PFUnA)	0.63	U	U	0.63	1.7		ng/L	
PFEESA	0.25	U	U	0.25	1.7		ng/L	
PFMBA	0.22	U	U	0.22	1.7		ng/L	
PFMPA	0.24	U	U	0.24	1.7		ng/L	
Field ID: RD82GW01S005								
102FTSA	0.4	U	U	0.4	1.7		ng/L	
11CLPF3OUDSA	0.41	U	U	0.41	1.7		ng/L	
3:3 FTCA	0.37	U	U	0.37	1.7		ng/L	
42FTSA	0.31	U	U	0.31	1.7		ng/L	
5:3 FTCA	0.28	U	U	0.28	1.7		ng/L	
62FTSA	0.33	U	U	0.33	4.3		ng/L	
7:3 FTCA	0.47	U	U	0.47	1.7		ng/L	
82FTSA	0.53	U	U	0.53	1.7		ng/L	
9CLPF3ONSA	0.36	U	U	0.36	1.7		ng/L	
ADONA	0.44	U	U	0.44	1.7		ng/L	
HFPODA	0.59	U	U	0.59	3.4		ng/L	
NETFOSA	0.64	U	U	0.64	1.7		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: RD82GW01S005								
NETFOSAA	0.29	U	U	0.29	4.3		ng/L	
NETFOSE	0.62	U	U	0.62	1.7		ng/L	
NFDHA	0.53	U	U	0.53	1.7		ng/L	
NMEFOSA	0.64	U	U	0.64	1.7		ng/L	
NMEFOSAA	0.4	U	U	0.4	4.3		ng/L	
NMEFOSE	0.41	U	U	0.41	3.4		ng/L	
Perfluorobutanesulfonic acid (PFBS)	0.29	U	U	0.29	1.7		ng/L	
Perfluorobutanoic acid (PFBA)	0.21	U	U	0.21	1.7		ng/L	EB<RL (none)
Perfluorodecanesulfonic acid (PFDS)	0.47	U	U	0.47	1.7		ng/L	
Perfluorodecanoic acid (PFDA)	0.28	U	U	0.28	1.7		ng/L	
Perfluorododecanoic acid (PFDoA)	0.36	U	U	0.36	1.7		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.61	U	U	0.61	1.7		ng/L	
Perfluoroheptanoic acid (PFHpA)	0.41	U	U	0.41	1.7		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	0.33	U	U	0.33	1.7		ng/L	
Perfluorohexanoic acid (PFHxA)	0.47	U	U	0.47	1.7		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.45	U	U	0.45	1.7		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.52	U	U	0.52	1.7		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.57	U	U	0.57	1.7		ng/L	
Perfluorononanoic acid (PFNA)	0.48	U	U	0.48	1.7		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.45	U	U	0.45	1.7		ng/L	
Perfluorooctanesulfonic acid (PFOS)	0.5	U	U	0.5	1.7		ng/L	
Perfluorooctanoic acid (PFOA)	0.48	U	U	0.48	1.7		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	0.44	U	U	0.44	1.7		ng/L	
Perfluoropentanoic acid (PFPeA)	0.21	U	U	0.21	1.7		ng/L	
Perfluorotetradecanoic acid (PFTeA)	0.44	U	U	0.44	1.7		ng/L	
Perfluorotridecanoic acid (PFTrDA)	0.59	U	U	0.59	1.7		ng/L	
Perfluoroundecanoic acid (PFUnA)	0.63	U	U	0.63	1.7		ng/L	
PFEESA	0.25	U	U	0.25	1.7		ng/L	
PFMBA	0.22	U	U	0.22	1.7		ng/L	
PFMPA	0.24	U	U	0.24	1.7		ng/L	
Field ID: ND126GWS013								
102FTSA	0.38	U	U	0.38	1.6		ng/L	
11CLPF3OUDSA	0.39	U	U	0.39	1.6		ng/L	
3:3 FTCA	0.35	U	U	0.35	1.6		ng/L	
42FTSA	0.29	U	U	0.29	1.6		ng/L	
5:3 FTCA	0.27	U	U	0.27	1.6		ng/L	
62FTSA	0.31	U	U	0.31	4		ng/L	
7:3 FTCA	0.44	U	U	0.44	1.6		ng/L	
82FTSA	0.5	U	U	0.5	1.6		ng/L	
9CLPF3ONSA	0.34	U	U	0.34	1.6		ng/L	
ADONA	0.41	U	U	0.41	1.6		ng/L	
HFPODA	0.56	U	U	0.56	3.2		ng/L	
NETFOSA	0.6	U	U	0.6	1.6		ng/L	
NETFOSAA	0.27	U	U	0.27	4		ng/L	
NETFOSE	0.58	U	U	0.58	1.6		ng/L	
NFDHA	0.5	U	U	0.5	1.6		ng/L	
NMEFOSA	0.6	U	U	0.6	1.6		ng/L	
NMEFOSAA	0.37	U	U	0.37	4		ng/L	
NMEFOSE	0.39	U	U	0.39	3.2		ng/L	
Perfluorobutanesulfonic acid (PFBS)	0.44	U	J	0.27	1.6		ng/L	EMPC (U)
Perfluorobutanoic acid (PFBA)	8.8			0.19	1.6		ng/L	
Perfluorodecanesulfonic acid (PFDS)	0.44	U	U	0.44	1.6		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: ND126GWS013								
Perfluorodecanoic acid (PFDA)	0.27	U	U	0.27	1.6		ng/L	
Perfluorododecanoic acid (PFDoA)	0.34	U	U	0.34	1.6		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.57	U	U	0.57	1.6		ng/L	
Perfluoroheptanoic acid (PFHpA)	2.6			0.39	1.6		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	0.48	U	J	0.31	1.6		ng/L	EMPC (U)
Perfluorohexanoic acid (PFHxA)	3.1			0.44	1.6		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.42	U	U	0.42	1.6		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.48	U	U	0.48	1.6		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.53	U	U	0.53	1.6		ng/L	
Perfluorononanoic acid (PFNA)	0.45	U	U	0.45	1.6		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.42	U	U	0.42	1.6		ng/L	
Perfluorooctanesulfonic acid (PFOS)	0.47	U	U	0.47	1.6		ng/L	
Perfluorooctanoic acid (PFOA)	5.4			0.45	1.6		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	0.41	U	U	0.41	1.6		ng/L	
Perfluoropentanoic acid (PFPeA)	5			0.19	1.6		ng/L	
Perfluorotetradecanoic acid (PFTeA)	0.41	U	U	0.41	1.6		ng/L	
Perfluorotridecanoic acid (PFTrDA)	0.56	U	U	0.56	1.6		ng/L	
Perfluoroundecanoic acid (PFUnA)	0.59	U	U	0.59	1.6		ng/L	
PFEESA	0.23	U	U	0.23	1.6		ng/L	
PFMBA	0.21	U	U	0.21	1.6		ng/L	
PFMPA	0.23	U	U	0.23	1.6		ng/L	
Field ID: PZ048GWS004								
102FTSA	0.4	U	U	0.4	1.7		ng/L	
11CLPF3OUDSA	0.41	U	U	0.41	1.7		ng/L	
3:3 FTCA	0.37	U	U	0.37	1.7		ng/L	
42FTSA	0.31	U	U	0.31	1.7		ng/L	
5:3 FTCA	0.28	U	U	0.28	1.7		ng/L	
62FTSA	15			0.32	4.3		ng/L	
7:3 FTCA	0.47	U	U	0.47	1.7		ng/L	
82FTSA	0.53	U	U	0.53	1.7		ng/L	
9CLPF3ONSA	0.36	U	U	0.36	1.7		ng/L	
ADONA	0.44	U	U	0.44	1.7		ng/L	
HFPODA	0.59	U	U	0.59	3.4		ng/L	
NETFOSA	0.63	U	U	0.63	1.7		ng/L	
NETFOSAA	0.29	U	U	0.29	4.3		ng/L	
NETFOSE	0.62	U	U	0.62	1.7		ng/L	
NFDHA	0.53	U	U	0.53	1.7		ng/L	
NMEFOSA	0.63	U	U	0.63	1.7		ng/L	
NMEFOSAA	0.39	U	U	0.39	4.3		ng/L	
NMEFOSE	0.41	U	U	0.41	3.4		ng/L	
Perfluorobutanesulfonic acid (PFBS)	5.7			0.29	1.7		ng/L	
Perfluorobutanoic acid (PFBA)	120			0.21	1.7		ng/L	
Perfluorodecanesulfonic acid (PFDS)	0.47	U	U	0.47	1.7		ng/L	
Perfluorodecanoic acid (PFDA)	0.28	U	U	0.28	1.7		ng/L	
Perfluorododecanoic acid (PFDoA)	0.36	U	U	0.36	1.7		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.61	U	U	0.61	1.7		ng/L	
Perfluoroheptanoic acid (PFHpA)	110			0.41	1.7		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	3.3			0.32	1.7		ng/L	
Perfluorohexanoic acid (PFHxA)	82			0.47	1.7		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.44	U	U	0.44	1.7		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.51	U	U	0.51	1.7		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.56	U	U	0.56	1.7		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: PZ048GWS004								
Perfluorononanoic acid (PFNA)	1.5	J	J	0.48	1.7		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.44	U	U	0.44	1.7		ng/L	
Perfluorooctanesulfonic acid (PFOS)	5.1			0.5	1.7		ng/L	
Perfluorooctanoic acid (PFOA)	55			0.48	1.7		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	0.85	J	J	0.44	1.7		ng/L	
Perfluoropentanoic acid (PFPeA)	97			0.21	1.7		ng/L	
Perfluorotetradecanoic acid (PFTeA)	0.44	U	U	0.44	1.7		ng/L	
Perfluorotridecanoic acid (PFTTrDA)	0.59	U	U	0.59	1.7		ng/L	
Perfluoroundecanoic acid (PFUnA)	0.62	U	U	0.62	1.7		ng/L	
PFEESA	0.25	U	U	0.25	1.7		ng/L	
PFMBA	0.22	U	U	0.22	1.7		ng/L	
PFMPA	0.24	U	U	0.24	1.7		ng/L	
Field ID: RD79GWS011								
102FTSA	0.43	U	U	0.43	1.8		ng/L	
11CLPF3OUDSA	0.44	U	U	0.44	1.8		ng/L	
3:3 FTCA	0.39	U	U	0.39	1.8		ng/L	
42FTSA	0.33	U	U	0.33	1.8		ng/L	
5:3 FTCA	0.3	U	U	0.3	1.8		ng/L	
62FTSA	0.35	U	U	0.35	4.6		ng/L	
7:3 FTCA	0.5	U	U	0.5	1.8		ng/L	
82FTSA	0.56	U	U	0.56	1.8		ng/L	
9CLPF3ONSA	0.38	U	U	0.38	1.8		ng/L	
ADONA	0.46	U	U	0.46	1.8		ng/L	
HFPODA	0.63	U	U	0.63	3.6		ng/L	
NETFOSA	0.67	U	U	0.67	1.8		ng/L	
NETFOSAA	0.31	U	U	0.31	4.6		ng/L	
NETFOSE	0.66	U	U	0.66	1.8		ng/L	
NFDHA	0.56	U	U	0.56	1.8		ng/L	
NMEFOSA	0.67	U	U	0.67	1.8		ng/L	
NMEFOSAA	0.42	U	U	0.42	4.6		ng/L	
NMEFOSE	0.44	U	U	0.44	3.6		ng/L	
Perfluorobutanesulfonic acid (PFBS)	10			0.31	1.8		ng/L	
Perfluorobutanoic acid (PFBA)	160			0.22	1.8		ng/L	EB<RL (None)
Perfluorodecanesulfonic acid (PFDS)	0.5	U	U	0.5	1.8		ng/L	
Perfluorodecanoic acid (PFDA)	9.6			0.3	1.8		ng/L	
Perfluorododecanoic acid (PFDoA)	0.38	U	U	0.38	1.8		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.65	U	U	0.65	1.8		ng/L	
Perfluoroheptanoic acid (PFHpA)	47			0.44	1.8		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	2.6			0.35	1.8		ng/L	
Perfluorohexanoic acid (PFHxA)	61			0.5	1.8		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.47	U	U	0.47	1.8		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.55	U	U	0.55	1.8		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.6	U	U	0.6	1.8		ng/L	
Perfluorononanoic acid (PFNA)	17			0.51	1.8		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.47	U	U	0.47	1.8		ng/L	
Perfluorooctanesulfonic acid (PFOS)	14			0.53	1.8		ng/L	
Perfluorooctanoic acid (PFOA)	71			0.51	1.8		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	0.46	U	U	0.46	1.8		ng/L	
Perfluoropentanoic acid (PFPeA)	48			0.22	1.8		ng/L	
Perfluorotetradecanoic acid (PFTeA)	0.46	U	U	0.46	1.8		ng/L	
Perfluorotridecanoic acid (PFTTrDA)	0.63	U	U	0.63	1.8		ng/L	
Perfluoroundecanoic acid (PFUnA)	0.81	J	J	0.66	1.8		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: RD79GWS011								
PFEESA	0.26	U	U	0.26	1.8		ng/L	
PFMBA	0.24	U	U	0.24	1.8		ng/L	
PFMPA	0.25	U	U	0.25	1.8		ng/L	

Validation Flag Abbreviations

<i>Abbreviation</i>	<i>Validation Reason</i>	<i>Category</i>
EB<RL	Equipment blank concentration less than the reporting limit	Blank
EMPC	Estimated Maximum Possible Concentration	Matrix
Sur>UCL	Surrogate recovery greater than the upper control limit	SurrogateRecovery

NASA SSFL CJ063 PFAS PO 148024177

Data Quality Evaluation

SDG 570-97758-1

Reviewer: mfesler

Method E537M

Date: 6/26/2022

Matrix WATER

Reviewed: 6/26/2022

Field Samples

Field blank association lot values: LotNumber / FieldID / SDG

NativeID	QAQC Type	Dilution	ABLotValue	EBLotValue	TBLotValue
WATER					
EBQW2397Q001	EB	1		26052201 / EBQW2397Q001 / 570-97758-1	
EBQW2398Q001	EB	1		27052201 / EBQW2398Q001 / 570-97758-1	
HAR19GW01S030	N	10	31052201 / FBQW1880Q001 / 570-98129-1	27052201 / EBQW2398Q001 / 570-97758-1	
HAR19GW01S030	N	1	31052201 / FBQW1880Q001 / 570-98129-1	27052201 / EBQW2398Q001 / 570-97758-1	
ND113GW01S014	N	1	25052201 / FBQW1879Q001 / 570-97487-1		
ND134GW01S014	N	1	31052201 / FBQW1880Q001 / 570-98129-1		
PZ017AGWS003	N	1	25052201 / FBQW1879Q001 / 570-97487-1	26052201 / EBQW2397Q001 / 570-97758-1	
PZ045GWS002	N	1	25052201 / FBQW1879Q001 / 570-97487-1	27052201 / EBQW2398Q001 / 570-97758-1	

Associated Field Blanks (other SDGs)

NativeID	QAQC Type	Dilution	ABLotValue	EBLotValue	TBLotValue
WATER					
FBQW1879Q001	AB	1	25052201 / FBQW1879Q001 / 570-97487-1	27052201 / EBQW2398Q001 / 570-97758-1	
FBQW1879Q001	AB	1	25052201 / FBQW1879Q001 / 570-97487-1	26052201 / EBQW2397Q001 / 570-97758-1	
FBQW1879Q001	AB	1	25052201 / FBQW1879Q001 / 570-97487-1		
FBQW1880Q001	AB	1	31052201 / FBQW1880Q001 / 570-98129-1	27052201 / EBQW2398Q001 / 570-97758-1	
FBQW1880Q001	AB	1	31052201 / FBQW1880Q001 / 570-98129-1		

1. Case Narrative

Items of Interest

The following items were noted: EMPC

2. Blank Summary

Field Blanks

No Field Blank detects were found.

Method Blanks

No Method Blank detects were found.

3. Spikes and Duplicates

Field Duplicate

No FD Associated.

Laboratory Duplicates

None in this SDG

Matrix Spike

No MS's for this SDG. No SD's for this SDG. MS RPD: None for this SDG. Specific analytes did not meet the 10:1 S:N ratio or ion ratio criteria. Associated results flagged as non-detect "U".

<i>Matrix</i>	<i>Sample ID</i>	<i>LR Type</i>	<i>Analyte</i>	<i>Result</i>	<i>MS/MSD Qualifier*</i>	<i>Criteria</i>
WATER			<u>Perfluorobutanesulfonic acid (PFBS)</u>			
	HAR19GW01S030			2.2 ng/L	U	EMPC
WATER			<u>Perfluoropentanesulfonic acid (PFPeS)</u>			
	ND113GW01S014			0.49 ng/L	U	EMPC
WATER			<u>Perfluoropentanoic acid (PFPeA)</u>			
	PZ045GWS002			1.6 ng/L	U	EMPC

4. Laboratory Control Sample

All acceptance criteria were met.

5. Surrogates

All acceptance criteria were met.

6. Tuning and Mass Calibration

Tuning and Mass Calibration were not examined by AutoDV.

7. Internal Standard

Internal Standard Area/Retention Time was not examined by AutoDV.

8. Calibration Information

Initial Calibration

Initial Calibration was not examined by AutoDV.

Continuing Calibration

Continuing Calibration was not examined by AutoDV.

9. Holding Time

All acceptance criteria were met.

10. Confirmation

None for this SDG.

11. Summary

General Comments

Field Duplicates: No FD Associated.

Form I Review: These NativeIDs had dilutions or re-extractions that were flagged Exclude: HAR19GW01S030.

Tuning and Mass Calibration: Tuning and Mass Calibration were not examined by AutoDV.

Internal Standard Area/Retention Time: Internal Standard Area/Retention Time was not examined by AutoDV.

Initial Calibration: Initial Calibration was not examined by AutoDV.

Continuing Calibration: Continuing Calibration was not examined by AutoDV.

VDMS4.56

Data Package Completeness Package was complete for level V validation

Forms Review/ Items of Interest

These NativeIDs had dilutions or re-extractions that were flagged Exclude: HAR19GW01S030. Samples were re-analyzed on a diluted basis due to concentration of target analytes

COC Review

No discrepancies were noted

Final Data Flags*

*When the data evaluation process results in multiple flags, the most severe flag becomes the final data flag. All flags are from the site-specific QAPP, except the "exclude" flag that is used to designate results that are not for risk assessment (for example, a result from a dilution where the original undiluted result is appropriate).

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: HAR19GW01S030								
102FTSA	3.7	exclude	U	3.7	16		ng/L	RE (exclude)
	0.37	U	U	0.37	1.6		ng/L	
11CLPF3OUDSA	0.38	U	U	0.38	1.6		ng/L	
	3.8	exclude	U	3.8	16		ng/L	RE (exclude)
3:3 FTCA	0.34	U	U	0.34	1.6		ng/L	
	3.4	exclude	U	3.4	16		ng/L	RE (exclude)
42FTSA	0.28	U	U	0.28	1.6		ng/L	
	2.8	exclude	U	2.8	16		ng/L	RE (exclude)
5:3 FTCA	0.26	U	U	0.26	1.6		ng/L	
	2.6	exclude	U	2.6	16		ng/L	RE (exclude)
62FTSA	0.3	U	U	0.3	3.9		ng/L	
	4.9	exclude	J	3	39		ng/L	RE (exclude)
7:3 FTCA	0.43	U	U	0.43	1.6		ng/L	
	4.3	exclude	U	4.3	16		ng/L	RE (exclude)
82FTSA	0.49	U	U	0.49	1.6		ng/L	
	4.9	exclude	U	4.9	16		ng/L	RE (exclude)
9CLPF3ONSA	0.33	U	U	0.33	1.6		ng/L	
	3.3	exclude	U	3.3	16		ng/L	RE (exclude)
ADONA	0.4	U	U	0.4	1.6		ng/L	
	4	exclude	U	4	16		ng/L	RE (exclude)
HFPODA	0.54	U	U	0.54	3.2		ng/L	
	5.4	exclude	U	5.4	32		ng/L	RE (exclude)
NETFOSA	0.58	U	U	0.58	1.6		ng/L	
	5.8	exclude	U	5.8	16		ng/L	RE (exclude)
NETFOSAA	2.7	exclude	U	2.7	39		ng/L	RE (exclude)
	0.27	U	U	0.27	3.9		ng/L	
NETFOSE	0.57	U	U	0.57	1.6		ng/L	
	5.7	exclude	U	5.7	16		ng/L	RE (exclude)
NFDHA	0.49	U	U	0.49	1.6		ng/L	
	4.9	exclude	U	4.9	16		ng/L	RE (exclude)
NMEFOSA	0.58	U	U	0.58	1.6		ng/L	
	5.8	exclude	U	5.8	16		ng/L	RE (exclude)
NMEFOSAA	0.36	U	U	0.36	3.9		ng/L	
	3.6	exclude	U	3.6	39		ng/L	RE (exclude)
NMEFOSE	0.38	U	U	0.38	3.2		ng/L	
	3.8	exclude	U	3.8	32		ng/L	RE (exclude)
Perfluorobutanesulfonic acid (PFBS)	2.2	U	I	0.27	1.6		ng/L	EMPC (U)
	2.7	exclude	U	2.7	16		ng/L	RE (exclude)
Perfluorobutanoic acid (PFBA)	24			0.19	1.6		ng/L	
	24	exclude		1.9	16		ng/L	RE (exclude)
Perfluorodecanesulfonic acid (PFDS)	4.3	exclude	U	4.3	16		ng/L	RE (exclude)
	0.43	U	U	0.43	1.6		ng/L	
Perfluorodecanoic acid (PFDA)	0.26	U	U	0.26	1.6		ng/L	
	2.6	exclude	U	2.6	16		ng/L	RE (exclude)
Perfluorododecanoic acid (PFDoA)	0.33	U	U	0.33	1.6		ng/L	
	3.3	exclude	U	3.3	16		ng/L	RE (exclude)
Perfluoroheptanesulfonic acid (PFHpS)	0.56	U	U	0.56	1.6		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: HAR19GW01S030								
Perfluoroheptanoic acid (PFHpA)	5.6	exclude	U	5.6	16		ng/L	RE (exclude)
	69	exclude		3.8	16		ng/L	RE (exclude)
	70			0.38	1.6		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	2			0.3	1.6		ng/L	
	3	exclude	U	3	16		ng/L	RE (exclude)
Perfluorohexanoic acid (PFHxA)	58			0.43	1.6		ng/L	
	61	exclude		4.3	16		ng/L	RE (exclude)
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.41	U	U	0.41	1.6		ng/L	
	4.1	exclude	U	4.1	16		ng/L	RE (exclude)
Perfluoro-n-octadecanoic acid (PFODA)	4.7	exclude	U	4.7	16		ng/L	RE (exclude)
	0.47	U	U	0.47	1.6		ng/L	
Perfluoronanesulfonic acid (PFNS)	0.52	U	U	0.52	1.6		ng/L	
	5.2	exclude	U	5.2	16		ng/L	RE (exclude)
Perfluorononanoic acid (PFNA)	0.44	U	U	0.44	1.6		ng/L	
	4.4	exclude	U	4.4	16		ng/L	RE (exclude)
Perfluorooctanesulfonamide (FOSA)	0.41	U	U	0.41	1.6		ng/L	
	4.1	exclude	U	4.1	16		ng/L	RE (exclude)
Perfluorooctanesulfonic acid (PFOS)	4.4			0.46	1.6		ng/L	
	4.6	exclude	U	4.6	16		ng/L	RE (exclude)
Perfluorooctanoic acid (PFOA)	510			4.4	16		ng/L	
	520	exclude	E	0.44	1.6		ng/L	RE (exclude)
Perfluoropentanesulfonic acid (PFPeS)	0.58	J	J	0.4	1.6		ng/L	
	4	exclude	U	4	16		ng/L	RE (exclude)
Perfluoropentanoic acid (PFPeA)	11			0.19	1.6		ng/L	
	11	exclude	J	1.9	16		ng/L	RE (exclude)
Perfluorotetradecanoic acid (PFTeA)	0.4	U	U	0.4	1.6		ng/L	
	4	exclude	U	4	16		ng/L	RE (exclude)
Perfluorotridecanoic acid (PFTrDA)	0.54	U	U	0.54	1.6		ng/L	
	5.4	exclude	U	5.4	16		ng/L	RE (exclude)
Perfluoroundecanoic acid (PFUnA)	5.8	exclude	U	5.8	16		ng/L	RE (exclude)
	0.58	U	U	0.58	1.6		ng/L	
PFEESA	2.3	exclude	U	2.3	16		ng/L	RE (exclude)
	0.23	U	U	0.23	1.6		ng/L	
PFMBA	0.2	U	U	0.2	1.6		ng/L	
	2	exclude	U	2	16		ng/L	RE (exclude)
PFMPA	0.22	U	U	0.22	1.6		ng/L	
	2.2	exclude	U	2.2	16		ng/L	RE (exclude)
Field ID: ND113GW01S014								
102FTSA	0.39	U	U	0.39	1.7		ng/L	
11CLPF3OUDSA	0.4	U	U	0.4	1.7		ng/L	
3:3 FTCA	0.36	U	U	0.36	1.7		ng/L	
42FTSA	0.3	U	U	0.3	1.7		ng/L	
5:3 FTCA	0.27	U	U	0.27	1.7		ng/L	
62FTSA	2.8	J	J	0.31	4.1		ng/L	
7:3 FTCA	0.45	U	U	0.45	1.7		ng/L	
82FTSA	0.51	U	U	0.51	1.7		ng/L	
9CLPF3ONSA	0.35	U	U	0.35	1.7		ng/L	
ADONA	0.42	U	U	0.42	1.7		ng/L	
HFPODA	0.57	U	U	0.57	3.3		ng/L	
NETFOSA	0.61	U	U	0.61	1.7		ng/L	
NETFOSAA	0.28	U	U	0.28	4.1		ng/L	
NETFOSE	0.6	U	U	0.6	1.7		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: ND113GW01S014								
NFDHA	0.51	U	U	0.51	1.7		ng/L	
NMEFOSA	0.61	U	U	0.61	1.7		ng/L	
NMEFOSAA	0.38	U	U	0.38	4.1		ng/L	
NMEFOSE	0.4	U	U	0.4	3.3		ng/L	
Perfluorobutanesulfonic acid (PFBS)	1.7			0.28	1.7		ng/L	
Perfluorobutanoic acid (PFBA)	24			0.2	1.7		ng/L	
Perfluorodecanesulfonic acid (PFDS)	0.45	U	U	0.45	1.7		ng/L	
Perfluorodecanoic acid (PFDA)	0.43	J	J	0.27	1.7		ng/L	
Perfluorododecanoic acid (PFDoA)	3.4			0.35	1.7		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.59	U	U	0.59	1.7		ng/L	
Perfluoroheptanoic acid (PFHpA)	3.5			0.4	1.7		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	1.1	J	J	0.31	1.7		ng/L	
Perfluorohexanoic acid (PFHxA)	4.2			0.45	1.7		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.43	U	U	0.43	1.7		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.5	U	U	0.5	1.7		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.55	U	U	0.55	1.7		ng/L	
Perfluorononanoic acid (PFNA)	2.7			0.46	1.7		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.43	U	U	0.43	1.7		ng/L	
Perfluorooctanesulfonic acid (PFOS)	3.8			0.48	1.7		ng/L	
Perfluorooctanoic acid (PFOA)	21			0.46	1.7		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	0.49	U	J I	0.42	1.7		ng/L	EMPC (U)
Perfluoropentanoic acid (PFPeA)	3.7			0.2	1.7		ng/L	
Perfluorotetradecanoic acid (PFTeA)	0.51	J	J	0.42	1.7		ng/L	
Perfluorotridecanoic acid (PFTrDA)	3.5			0.57	1.7		ng/L	
Perfluoroundecanoic acid (PFUnA)	2.4			0.6	1.7		ng/L	
PFEESA	0.24	U	U	0.24	1.7		ng/L	
PFMBA	0.21	U	U	0.21	1.7		ng/L	
PFMPA	0.23	U	U	0.23	1.7		ng/L	
Field ID: ND134GW01S014								
102FTSA	0.39	U	U	0.39	1.7		ng/L	
11CLPF3OUDSA	0.4	U	U	0.4	1.7		ng/L	
3:3 FTCA	0.36	U	U	0.36	1.7		ng/L	
42FTSA	0.3	U	U	0.3	1.7		ng/L	
5:3 FTCA	0.27	U	U	0.27	1.7		ng/L	
62FTSA	0.31	U	U	0.31	4.1		ng/L	
7:3 FTCA	0.45	U	U	0.45	1.7		ng/L	
82FTSA	0.51	U	U	0.51	1.7		ng/L	
9CLPF3ONSA	0.35	U	U	0.35	1.7		ng/L	
ADONA	0.42	U	U	0.42	1.7		ng/L	
HFPODA	0.57	U	U	0.57	3.3		ng/L	
NETFOSA	0.61	U	U	0.61	1.7		ng/L	
NETFOSAA	0.28	U	U	0.28	4.1		ng/L	
NETFOSE	0.59	U	U	0.59	1.7		ng/L	
NFDHA	0.51	U	U	0.51	1.7		ng/L	
NMEFOSA	0.61	U	U	0.61	1.7		ng/L	
NMEFOSAA	0.38	U	U	0.38	4.1		ng/L	
NMEFOSE	0.4	U	U	0.4	3.3		ng/L	
Perfluorobutanesulfonic acid (PFBS)	0.28	U	U	0.28	1.7		ng/L	
Perfluorobutanoic acid (PFBA)	0.2	U	U	0.2	1.7		ng/L	
Perfluorodecanesulfonic acid (PFDS)	0.45	U	U	0.45	1.7		ng/L	
Perfluorodecanoic acid (PFDA)	0.27	U	U	0.27	1.7		ng/L	
Perfluorododecanoic acid (PFDoA)	0.35	U	U	0.35	1.7		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: ND134GW01S014								
Perfluoroheptanesulfonic acid (PFHpS)	0.59	U	U	0.59	1.7		ng/L	
Perfluoroheptanoic acid (PFHpA)	0.4	U	U	0.4	1.7		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	0.31	U	U	0.31	1.7		ng/L	
Perfluorohexanoic acid (PFHxA)	0.45	U	U	0.45	1.7		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.43	U	U	0.43	1.7		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.5	U	U	0.5	1.7		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.55	U	U	0.55	1.7		ng/L	
Perfluorononanoic acid (PFNA)	0.46	U	U	0.46	1.7		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.43	U	U	0.43	1.7		ng/L	
Perfluorooctanesulfonic acid (PFOS)	0.48	U	U	0.48	1.7		ng/L	
Perfluorooctanoic acid (PFOA)	0.46	U	U	0.46	1.7		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	0.42	U	U	0.42	1.7		ng/L	
Perfluoropentanoic acid (PFPeA)	0.2	U	U	0.2	1.7		ng/L	
Perfluorotetradecanoic acid (PFTeA)	0.42	U	U	0.42	1.7		ng/L	
Perfluorotridecanoic acid (PFTTrDA)	0.57	U	U	0.57	1.7		ng/L	
Perfluoroundecanoic acid (PFUnA)	0.6	U	U	0.6	1.7		ng/L	
PFEESA	0.24	U	U	0.24	1.7		ng/L	
PFMBA	0.21	U	U	0.21	1.7		ng/L	
PFMPA	0.23	U	U	0.23	1.7		ng/L	
Field ID: PZ017AGWS003								
102FTSA	0.38	U	U	0.38	1.6		ng/L	
11CLPF3OUDSA	0.39	U	U	0.39	1.6		ng/L	
3:3 FTCA	0.35	U	U	0.35	1.6		ng/L	
42FTSA	0.29	U	U	0.29	1.6		ng/L	
5:3 FTCA	0.27	U	U	0.27	1.6		ng/L	
62FTSA	0.75	J	J	0.31	4.1		ng/L	
7:3 FTCA	0.45	U	U	0.45	1.6		ng/L	
82FTSA	0.51	U	U	0.51	1.6		ng/L	
9CLPF3ONSA	0.34	U	U	0.34	1.6		ng/L	
ADONA	0.42	U	U	0.42	1.6		ng/L	
HFPODA	0.56	U	U	0.56	3.3		ng/L	
NETFOSA	0.61	U	U	0.61	1.6		ng/L	
NETFOSAA	0.28	U	U	0.28	4.1		ng/L	
NETFOSE	0.59	U	U	0.59	1.6		ng/L	
NFDHA	0.51	U	U	0.51	1.6		ng/L	
NMEFOSA	0.61	U	U	0.61	1.6		ng/L	
NMEFOSAA	0.38	U	U	0.38	4.1		ng/L	
NMEFOSE	0.39	U	U	0.39	3.3		ng/L	
Perfluorobutanesulfonic acid (PFBS)	5.4			0.28	1.6		ng/L	
Perfluorobutanoic acid (PFBA)	90			0.2	1.6		ng/L	
Perfluorodecanesulfonic acid (PFDS)	0.45	U	U	0.45	1.6		ng/L	
Perfluorodecanoic acid (PFDA)	0.54	J	J	0.27	1.6		ng/L	
Perfluorododecanoic acid (PFDoA)	0.34	U	U	0.34	1.6		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.58	U	U	0.58	1.6		ng/L	
Perfluoroheptanoic acid (PFHpA)	32			0.39	1.6		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	1.9			0.31	1.6		ng/L	
Perfluorohexanoic acid (PFHxA)	32			0.45	1.6		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.43	U	U	0.43	1.6		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.49	U	U	0.49	1.6		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.54	U	U	0.54	1.6		ng/L	
Perfluorononanoic acid (PFNA)	8.9			0.46	1.6		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.43	U	U	0.43	1.6		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: PZ017AGWS003								
Perfluorooctanesulfonic acid (PFOS)	5.6			0.47	1.6		ng/L	
Perfluorooctanoic acid (PFOA)	39			0.46	1.6		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	0.42	U	U	0.42	1.6		ng/L	
Perfluoropentanoic acid (PFPeA)	32			0.2	1.6		ng/L	
Perfluorotetradecanoic acid (PFTeA)	0.42	U	U	0.42	1.6		ng/L	
Perfluorotridecanoic acid (PFTTrDA)	0.56	U	U	0.56	1.6		ng/L	
Perfluoroundecanoic acid (PFUnA)	0.6	U	U	0.6	1.6		ng/L	
PFEESA	0.24	U	U	0.24	1.6		ng/L	
PFMBA	0.21	U	U	0.21	1.6		ng/L	
PFMPA	0.23	U	U	0.23	1.6		ng/L	
Field ID: PZ045GWS002								
102FTSA	0.39	U	U	0.39	1.7		ng/L	
11CLPF3OUDSA	0.4	U	U	0.4	1.7		ng/L	
3:3 FTCA	0.36	U	U	0.36	1.7		ng/L	
42FTSA	0.3	U	U	0.3	1.7		ng/L	
5:3 FTCA	0.28	U	U	0.28	1.7		ng/L	
62FTSA	0.32	U	U	0.32	4.2		ng/L	
7:3 FTCA	0.46	U	U	0.46	1.7		ng/L	
82FTSA	0.52	U	U	0.52	1.7		ng/L	
9CLPF3ONSA	0.35	U	U	0.35	1.7		ng/L	
ADONA	0.43	U	U	0.43	1.7		ng/L	
HFPODA	0.58	U	U	0.58	3.3		ng/L	
NETFOSA	0.62	U	U	0.62	1.7		ng/L	
NETFOSAA	0.28	U	U	0.28	4.2		ng/L	
NETFOSE	0.6	U	U	0.6	1.7		ng/L	
NFDHA	0.52	U	U	0.52	1.7		ng/L	
NMEFOSA	0.62	U	U	0.62	1.7		ng/L	
NMEFOSAA	0.38	U	U	0.38	4.2		ng/L	
NMEFOSE	0.4	U	U	0.4	3.3		ng/L	
Perfluorobutanesulfonic acid (PFBS)	3.3			0.28	1.7		ng/L	
Perfluorobutanoic acid (PFBA)	22			0.2	1.7		ng/L	
Perfluorodecanesulfonic acid (PFDS)	0.46	U	U	0.46	1.7		ng/L	
Perfluorodecanoic acid (PFDA)	0.28	U	U	0.28	1.7		ng/L	
Perfluorododecanoic acid (PFDoA)	0.35	U	U	0.35	1.7		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.59	U	U	0.59	1.7		ng/L	
Perfluoroheptanoic acid (PFHpA)	5.1			0.4	1.7		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	1.7			0.32	1.7		ng/L	
Perfluorohexanoic acid (PFHxA)	3.2			0.46	1.7		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.43	U	U	0.43	1.7		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.5	U	U	0.5	1.7		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.55	U	U	0.55	1.7		ng/L	
Perfluorononanoic acid (PFNA)	2.9			0.47	1.7		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.43	U	U	0.43	1.7		ng/L	
Perfluorooctanesulfonic acid (PFOS)	10			0.48	1.7		ng/L	
Perfluorooctanoic acid (PFOA)	24			0.47	1.7		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	0.49	J	J	0.43	1.7		ng/L	
Perfluoropentanoic acid (PFPeA)	1.6	U	J	0.2	1.7		ng/L	EMPC (U)
Perfluorotetradecanoic acid (PFTeA)	0.43	U	U	0.43	1.7		ng/L	
Perfluorotridecanoic acid (PFTTrDA)	0.58	U	U	0.58	1.7		ng/L	
Perfluoroundecanoic acid (PFUnA)	0.61	U	U	0.61	1.7		ng/L	
PFEESA	0.24	U	U	0.24	1.7		ng/L	
PFMBA	0.22	U	U	0.22	1.7		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: PZ045GWS002								
PFMPA	0.23	U	U	0.23	1.7		ng/L	

Validation Flag Abbreviations

<i>Abbreviation</i>	<i>Validation Reason</i>	<i>Category</i>
EMPC	Estimated Maximum Possible Concentration	Matrix
RE	Re-extraction and/or re-analysis	Re-analysis

NASA SSFL CJ063 PFAS PO 148024177

Data Quality Evaluation

SDG 570-98129-1

Reviewer: mfesler

Method E537M

Date: 7/6/2022

Matrix WATER

Reviewed: 7/6/2022

Field Samples

Field blank association lot values: LotNumber / FieldID / SDG

NativeID	QAQC Type	Dilution	ABLotValue	EBLotValue	TBLotValue
WATER					
EBQW2399Q001	EB	1		31052201 / EBQW2399Q001 / 570-98129-1	
EBQW2400Q001	EB	1		01062201 / EBQW2400Q001 / 570-98129-1	
FBQW1880Q001	AB	1	31052201 / FBQW1880Q001 / 570-98129-1		
HAR27GWS014	N	1	31052201 / FBQW1880Q001 / 570-98129-1	01062201 / EBQW2400Q001 / 570-98129-1	
HAR28GW01S021	N	1	31052201 / FBQW1880Q001 / 570-98129-1	31052201 / EBQW2399Q001 / 570-98129-1	
ND135GW01S024	N	1	31052201 / FBQW1880Q001 / 570-98129-1		
ND135GW01S024MS	MS	1	31052201 / FBQW1880Q001 / 570-98129-1		
ND135GW01S024SD	SD	1	31052201 / FBQW1880Q001 / 570-98129-1		
PZ154GWS004	N	1	02062201 / FBQW1881Q001 / 570-98433-1	01062201 / EBQW2400Q001 / 570-98129-1	
RD49AGW01S012	N	1	02062201 / FBQW1881Q001 / 570-98433-1	25052202 / EBQW2396Q001 / 570-97487-1	

Associated Field Blanks (other SDGs)

NativeID	QAQC Type	Dilution	ABLotValue	EBLotValue	TBLotValue
WATER					
EBQW2396Q001	EB	1	02062201 / FBQW1881Q001 / 570-98433-1	25052202 / EBQW2396Q001 / 570-97487-1	
FBQW1881Q001	AB	1	02062201 / FBQW1881Q001 / 570-98433-1	25052202 / EBQW2396Q001 / 570-97487-1	
FBQW1881Q001	AB	1	02062201 / FBQW1881Q001 / 570-98433-1	01062201 / EBQW2400Q001 / 570-98129-1	

1. Case Narrative

Items of Interest

The following items were noted: LB<RL; SD>UCL; EMPC

2. Blank Summary

Field Blanks

No Field Blank detects were found.

Method Blanks

These analytes had Method Blank detects: 62FTSA. Associated detects that were less than 5 times the blank concentration were qualified as non-detect and flagged "U"

<u>Blank Type</u>	<u>Blank ID</u>	<u>Analyte</u>	<u>Result</u>	<u>Report Limit</u>	<u>Lab Flag</u>	<u>Units</u>	<u>SDG</u>
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LB MB 320-595240/1-A 62FTSA 0.6287 5 J ng/L 570-98129-1

3. Spikes and Duplicates

Field Duplicate

No FD Associated.

Laboratory Duplicates

None in this SDG

Matrix Spike

All MS acceptance criteria were met. These SD's were out of control: Perfluorobutanoic acid (PFBA) (SD - ND135GW01S024SD), Perfluoroheptanoic acid (PFHpA) (SD - ND135GW01S024SD). For PFHpA, the native sample conc was greater than 4 times the spike level; recovery could not be evaluated. For PFBA, the associated native sample result was qualified as estimated and flagged "J". All RPD acceptance criteria were met. Perfluoropentanoic (PFPeA) in sample HAR27GWS014 has a S:N ratio of less than 10, and the ion ratios for PFOS in sample PZ154GWS004 exceeded the 50 - 150% criteria when compared to the calibration standards. Results qualified as not detected and flagged "U".

Matrix	Sample ID	LR Type	Analyte	Result	MS/MSD Qualifier*	Criteria
WATER	ND135GW01S024		<u>Perfluorobutanoic acid (PFBA)</u>	21 ng/L	J	SD>UCL
WATER	ND135GW01S024		<u>Perfluoroheptanoic acid (PFHpA)</u>	180 ng/L	None	SD<LCL
WATER	PZ154GWS004		<u>Perfluorooctanesulfonic acid (PFOS)</u>	5.8 ng/L	U	EMPC
WATER	HAR27GWS014		<u>Perfluoropentanoic acid (PFPeA)</u>	2.4 ng/L	U	EMPC

4. Laboratory Control Sample

All acceptance criteria were met. No spike dupes in this SDG.

5. Surrogates

These surrogates were out of control: 13C2 10:2 FTS (EBQW2399Q001), 13C2 10:2 FTS (EBQW2400Q001), 13C2 10:2 FTS (HAR27GWS014), 13C2 4:2 FTS (RD49AGW01S012), 13C2 8:2 FTS (EBQW2399Q001). Since recoveries were high and sample results ND for HAR27 and RD49A, no flagging applied.

Field ID	LabsampleID	UpperLimit	LowerLimit	Result	Surrogate
EBQW2399Q001	570-98129-1	150	50	172	13C2 10:2 FTS
EBQW2399Q001	570-98129-1	150	50	155	13C2 8:2 FTS
EBQW2400Q001	570-98129-2	150	50	161	13C2 10:2 FTS
HAR27GWS014	570-98129-4	150	50	161	13C2 10:2 FTS
RD49AGW01S012	570-98129-8	150	50	164	13C2 4:2 FTS

6. Tuning and Mass Calibration

Tuning and Mass Calibration were not examined by AutoDV.

7. Internal Standard

Internal Standard Area/Retention Time was not examined by AutoDV.

8. Calibration Information

Initial Calibration

Initial Calibration was not examined by AutoDV.

Continuing Calibration

Continuing Calibration was not examined by AutoDV.

9. Holding Time

All acceptance criteria were met.

10. Confirmation

None for this SDG.

11. Summary

General Comments

Field Duplicates: No FD Associated.

Form I Review: No samples were excluded for dilutions or re-extractions.

Method Blanks: These analytes had Method Blank detects: 62FTSA. Associated detects that were less than 5 times the blank concentration were qualified as non-detect and flagged "U"

Surrogates: These surrogates were out of control: 13C2 10:2 FTS (EBQW2399Q001), 13C2 10:2 FTS (EBQW2400Q001), 13C2 10:2 FTS (HAR27GWS014), 13C2 4:2 FTS (RD49AGW01S012), 13C2 8:2 FTS (EBQW2399Q001). Since recoveries were high and sample results ND for HAR27 and RD49A, no flagging applied.

Tuning and Mass Calibration: No DV

Internal Standard Area/Retention Time: No DV

Initial Calibration: No DV

Continuing Calibration: No DV

COC: No discrepancies were noted

VDMS4.56

Data Package Completeness Package was complete for level V validation

Forms Review/ Items of Interest

No samples were excluded for dilutions or re-extractions.

COC Review

No discrepancies were noted

Final Data Flags*

*When the data evaluation process results in multiple flags, the most severe flag becomes the final data flag. All flags are from the site-specific QAPP, except the "exclude" flag that is used to designate results that are not for risk assessment (for example, a result from a dilution where the original undiluted result is appropriate).

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: HAR27GWS014								
102FTSA	0.38	U	U	0.38	1.6		ng/L	Sur>UCL (none)
11CLPF3OUDSA	0.39	U	U	0.39	1.6		ng/L	
3:3 FTCA	0.35	U	U	0.35	1.6		ng/L	
42FTSA	0.29	U	U	0.29	1.6		ng/L	
5:3 FTCA	0.27	U	U	0.27	1.6		ng/L	
62FTSA	0.31	U	U	0.31	4.1		ng/L	LB<RL (none)
7:3 FTCA	0.45	U	U	0.45	1.6		ng/L	
82FTSA	0.5	U	U	0.5	1.6		ng/L	
9CLPF3ONSA	0.34	U	U	0.34	1.6		ng/L	
ADONA	0.41	U	U	0.41	1.6		ng/L	
HFPODA	0.56	U	U	0.56	3.2		ng/L	
NETFOSA	0.6	U	U	0.6	1.6		ng/L	
NETFOSAA	0.28	U	U	0.28	4.1		ng/L	
NETFOSE	0.58	U	U	0.58	1.6		ng/L	
NFDHA	0.5	U	U	0.5	1.6		ng/L	
NMEFOSA	0.6	U	U	0.6	1.6		ng/L	
NMEFOSAA	0.37	U	U	0.37	4.1		ng/L	
NMEFOSE	0.39	U	U	0.39	3.2		ng/L	
Perfluorobutanesulfonic acid (PFBS)	2.3			0.28	1.6		ng/L	
Perfluorobutanoic acid (PFBA)	31			0.19	1.6		ng/L	
Perfluorodecanesulfonic acid (PFDS)	0.45	U	U	0.45	1.6		ng/L	
Perfluorodecanoic acid (PFDA)	0.27	U	U	0.27	1.6		ng/L	
Perfluorododecanoic acid (PFDoA)	0.34	U	U	0.34	1.6		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.58	U	U	0.58	1.6		ng/L	
Perfluoroheptanoic acid (PFHpA)	2.9			0.39	1.6		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	0.94	J	J	0.31	1.6		ng/L	
Perfluorohexanoic acid (PFHxA)	4.3			0.45	1.6		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.42	U	U	0.42	1.6		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.49	U	U	0.49	1.6		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.54	U	U	0.54	1.6		ng/L	
Perfluorononanoic acid (PFNA)	0.45	U	U	0.45	1.6		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.42	U	U	0.42	1.6		ng/L	
Perfluorooctanesulfonic acid (PFOS)	2.3			0.47	1.6		ng/L	
Perfluorooctanoic acid (PFOA)	18			0.45	1.6		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	0.41	U	U	0.41	1.6		ng/L	
Perfluoropentanoic acid (PFPeA)	2.4	U		0.19	1.6		ng/L	EMPC (U)
Perfluorotetradecanoic acid (PFTeA)	0.41	U	U	0.41	1.6		ng/L	
Perfluorotridecanoic acid (PFTTrDA)	0.56	U	U	0.56	1.6		ng/L	
Perfluoroundecanoic acid (PFUnA)	0.59	U	U	0.59	1.6		ng/L	
PFEESA	0.24	U	U	0.24	1.6		ng/L	
PFMBA	0.21	U	U	0.21	1.6		ng/L	
PFMPA	0.23	U	U	0.23	1.6		ng/L	
Field ID: HAR28GW01S021								
102FTSA	0.37	U	U	0.37	1.6		ng/L	
11CLPF3OUDSA	0.38	U	U	0.38	1.6		ng/L	
3:3 FTCA	0.34	U	U	0.34	1.6		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: HAR28GW01S021								
42FTSA	0.28	U	U	0.28	1.6		ng/L	
5:3 FTCA	0.26	U	U	0.26	1.6		ng/L	
62FTSA	0.3	U	U	0.3	3.9		ng/L	LB<RL (none)
7:3 FTCA	0.43	U	U	0.43	1.6		ng/L	
82FTSA	0.49	U	U	0.49	1.6		ng/L	
9CLPF3ONSA	0.33	U	U	0.33	1.6		ng/L	
ADONA	0.4	U	U	0.4	1.6		ng/L	
HFPODA	0.54	U	U	0.54	3.1		ng/L	
NETFOSA	0.58	U	U	0.58	1.6		ng/L	
NETFOSAA	0.27	U	U	0.27	3.9		ng/L	
NETFOSE	0.56	U	U	0.56	1.6		ng/L	
NFDHA	0.49	U	U	0.49	1.6		ng/L	
NMEFOSA	0.58	U	U	0.58	1.6		ng/L	
NMEFOSAA	0.36	U	U	0.36	3.9		ng/L	
NMEFOSE	0.38	U	U	0.38	3.1		ng/L	
Perfluorobutanesulfonic acid (PFBS)	0.76	J	J	0.27	1.6		ng/L	
Perfluorobutanoic acid (PFBA)	1.1	J	J	0.19	1.6		ng/L	
Perfluorodecanesulfonic acid (PFDS)	0.43	U	U	0.43	1.6		ng/L	
Perfluorodecanoic acid (PFDA)	0.26	U	U	0.26	1.6		ng/L	
Perfluorododecanoic acid (PFDoA)	0.33	U	U	0.33	1.6		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.56	U	U	0.56	1.6		ng/L	
Perfluoroheptanoic acid (PFHpA)	0.38	U	U	0.38	1.6		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	0.64	J	J	0.3	1.6		ng/L	
Perfluorohexanoic acid (PFHxA)	0.43	U	U	0.43	1.6		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.41	U	U	0.41	1.6		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.47	U	U	0.47	1.6		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.52	U	U	0.52	1.6		ng/L	
Perfluorononanoic acid (PFNA)	0.44	U	U	0.44	1.6		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.41	U	U	0.41	1.6		ng/L	
Perfluorooctanesulfonic acid (PFOS)	1.5	J	J	0.45	1.6		ng/L	
Perfluorooctanoic acid (PFOA)	0.87	J	J	0.44	1.6		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	0.4	U	U	0.4	1.6		ng/L	
Perfluoropentanoic acid (PFPeA)	0.19	U	U	0.19	1.6		ng/L	
Perfluorotetradecanoic acid (PFTeA)	0.4	U	U	0.4	1.6		ng/L	
Perfluorotridecanoic acid (PFTrDA)	0.54	U	U	0.54	1.6		ng/L	
Perfluoroundecanoic acid (PFUnA)	0.57	U	U	0.57	1.6		ng/L	
PFEESA	0.23	U	U	0.23	1.6		ng/L	
PFMBA	0.2	U	U	0.2	1.6		ng/L	
PFMPA	0.22	U	U	0.22	1.6		ng/L	
Field ID: ND135GW01S024								
102FTSA	0.37	U	U	0.37	1.6		ng/L	
11CLPF3OUDSA	0.38	U	U	0.38	1.6		ng/L	
3:3 FTCA	0.34	U	U	0.34	1.6		ng/L	
42FTSA	0.28	U	U	0.28	1.6		ng/L	
5:3 FTCA	0.26	U	U	0.26	1.6		ng/L	
62FTSA	0.3	U	U	0.3	4		ng/L	LB<RL (none)
7:3 FTCA	0.43	U	U	0.43	1.6		ng/L	
82FTSA	0.49	U	U	0.49	1.6		ng/L	
9CLPF3ONSA	0.33	U	U	0.33	1.6		ng/L	
ADONA	0.4	U	U	0.4	1.6		ng/L	
HFPODA	0.55	U	U	0.55	3.2		ng/L	
NETFOSA	0.59	U	U	0.59	1.6		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: ND135GW01S024								
NETFOSAA	0.27	U	U	0.27	4		ng/L	
NETFOSE	0.57	U	U	0.57	1.6		ng/L	
NFDHA	0.49	U	U	0.49	1.6		ng/L	
NMEFOSA	0.59	U	U	0.59	1.6		ng/L	
NMEFOSAA	0.36	U	U	0.36	4		ng/L	
NMEFOSE	0.38	U	U	0.38	3.2		ng/L	
Perfluorobutanesulfonic acid (PFBS)	0.27	U	U	0.27	1.6		ng/L	
Perfluorobutanoic acid (PFBA)	21	J		0.19	1.6		ng/L	SD>UCL (J)
Perfluorodecanesulfonic acid (PFDS)	0.43	U	U	0.43	1.6		ng/L	
Perfluorodecanoic acid (PFDA)	0.26	U	U	0.26	1.6		ng/L	
Perfluorododecanoic acid (PFDoA)	1.6			0.33	1.6		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.56	U	U	0.56	1.6		ng/L	
Perfluoroheptanoic acid (PFHpA)	180			0.38	1.6		ng/L	SD<LCL (None)
Perfluorohexanesulfonic acid (PFHxS)	0.68	J	J	0.3	1.6		ng/L	
Perfluorohexanoic acid (PFHxA)	190			0.43	1.6		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.41	U	U	0.41	1.6		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.47	U	U	0.47	1.6		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.52	U	U	0.52	1.6		ng/L	
Perfluorononanoic acid (PFNA)	0.44	U	U	0.44	1.6		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.41	U	U	0.41	1.6		ng/L	
Perfluorooctanesulfonic acid (PFOS)	0.46	U	U	0.46	1.6		ng/L	
Perfluorooctanoic acid (PFOA)	190			0.44	1.6		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	0.41	J	J	0.4	1.6		ng/L	
Perfluoropentanoic acid (PFPeA)	26			0.19	1.6		ng/L	
Perfluorotetradecanoic acid (PFTeA)	1.2	J	J	0.4	1.6		ng/L	
Perfluorotridecanoic acid (PFTrDA)	2.8			0.55	1.6		ng/L	
Perfluoroundecanoic acid (PFUnA)	2.7			0.58	1.6		ng/L	
PFEESA	0.23	U	U	0.23	1.6		ng/L	
PFMBA	0.21	J	J	0.21	1.6		ng/L	
PFMPA	0.22	U	U	0.22	1.6		ng/L	
Field ID: PZ154GWS004								
102FTSA	0.42	U	U	0.42	1.8		ng/L	
11CLPF3OUDSA	0.43	U	U	0.43	1.8		ng/L	
3:3 FTCA	0.39	U	U	0.39	1.8		ng/L	
42FTSA	0.32	U	U	0.32	1.8		ng/L	
5:3 FTCA	0.3	U	U	0.3	1.8		ng/L	
62FTSA	0.78	U	J B	0.34	4.5		ng/L	LB<RL (U)
7:3 FTCA	0.49	U	U	0.49	1.8		ng/L	
82FTSA	0.56	U	U	0.56	1.8		ng/L	
9CLPF3ONSA	0.38	U	U	0.38	1.8		ng/L	
ADONA	0.46	U	U	0.46	1.8		ng/L	
HFPODA	0.62	U	U	0.62	3.6		ng/L	
NETFOSA	0.66	U	U	0.66	1.8		ng/L	
NETFOSAA	0.31	U	U	0.31	4.5		ng/L	
NETFOSE	0.65	U	U	0.65	1.8		ng/L	
NFDHA	0.56	U	U	0.56	1.8		ng/L	
NMEFOSA	0.66	U	U	0.66	1.8		ng/L	
NMEFOSAA	0.41	U	U	0.41	4.5		ng/L	
NMEFOSE	0.43	U	U	0.43	3.6		ng/L	
Perfluorobutanesulfonic acid (PFBS)	1.1	J	J	0.31	1.8		ng/L	
Perfluorobutanoic acid (PFBA)	22			0.22	1.8		ng/L	
Perfluorodecanesulfonic acid (PFDS)	0.49	U	U	0.49	1.8		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: PZ154GWS004								
Perfluorodecanoic acid (PFDA)	0.3	U	U	0.3	1.8		ng/L	
Perfluorododecanoic acid (PFDoA)	0.38	U	U	0.38	1.8		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.64	U	U	0.64	1.8		ng/L	
Perfluoroheptanoic acid (PFHpA)	17			0.43	1.8		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	0.47	J	J	0.34	1.8		ng/L	
Perfluorohexanoic acid (PFHxA)	24			0.49	1.8		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.47	U	U	0.47	1.8		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.54	U	U	0.54	1.8		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.59	U	U	0.59	1.8		ng/L	
Perfluorononanoic acid (PFNA)	0.75	J	J	0.5	1.8		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.47	U	U	0.47	1.8		ng/L	
Perfluorooctanesulfonic acid (PFOS)	5.8	U	I	0.52	1.8		ng/L	EMPC (U)
Perfluorooctanoic acid (PFOA)	70			0.5	1.8		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	0.46	U	U	0.46	1.8		ng/L	
Perfluoropentanoic acid (PFPeA)	2.7			0.22	1.8		ng/L	
Perfluorotetradecanoic acid (PFTeA)	0.46	U	U	0.46	1.8		ng/L	
Perfluorotridecanoic acid (PFTrDA)	0.62	U	U	0.62	1.8		ng/L	
Perfluoroundecanoic acid (PFUnA)	0.66	U	U	0.66	1.8		ng/L	
PFEESA	0.26	U	U	0.26	1.8		ng/L	
PFMBA	0.23	U	U	0.23	1.8		ng/L	
PFMPA	0.25	U	U	0.25	1.8		ng/L	
Field ID: RD49AGW01S012								
102FTSA	0.39	U	U	0.39	1.6		ng/L	
11CLPF3OUDSA	0.39	U	U	0.39	1.6		ng/L	
3:3 FTCA	0.35	U	U	0.35	1.6		ng/L	
42FTSA	0.3	U	U	0.3	1.6		ng/L	Sur>UCL (none)
5:3 FTCA	0.27	U	U	0.27	1.6		ng/L	
62FTSA	0.31	U	U	0.31	4.1		ng/L	LB<RL (none)
7:3 FTCA	0.45	U	U	0.45	1.6		ng/L	
82FTSA	0.51	U	U	0.51	1.6		ng/L	
9CLPF3ONSA	0.35	U	U	0.35	1.6		ng/L	
ADONA	0.42	U	U	0.42	1.6		ng/L	
HFPODA	0.57	U	U	0.57	3.3		ng/L	
NETFOSA	0.61	U	U	0.61	1.6		ng/L	
NETFOSAA	0.28	U	U	0.28	4.1		ng/L	
NETFOSE	0.59	U	U	0.59	1.6		ng/L	
NFDHA	0.51	U	U	0.51	1.6		ng/L	
NMEFOSA	0.61	U	U	0.61	1.6		ng/L	
NMEFOSAA	0.38	U	U	0.38	4.1		ng/L	
NMEFOSE	0.39	U	U	0.39	3.3		ng/L	
Perfluorobutanesulfonic acid (PFBS)	1.9			0.28	1.6		ng/L	
Perfluorobutanoic acid (PFBA)	70			0.2	1.6		ng/L	
Perfluorodecanesulfonic acid (PFDS)	0.45	U	U	0.45	1.6		ng/L	
Perfluorodecanoic acid (PFDA)	0.27	U	U	0.27	1.6		ng/L	
Perfluorododecanoic acid (PFDoA)	0.35	U	U	0.35	1.6		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.58	U	U	0.58	1.6		ng/L	
Perfluoroheptanoic acid (PFHpA)	12			0.39	1.6		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	0.95	J	J	0.31	1.6		ng/L	
Perfluorohexanoic acid (PFHxA)	18			0.45	1.6		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.43	U	U	0.43	1.6		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.49	U	U	0.49	1.6		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.54	U	U	0.54	1.6		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: RD49AGW01S012								
Perfluorononanoic acid (PFNA)	23			0.46	1.6		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.43	U	U	0.43	1.6		ng/L	
Perfluorooctanesulfonic acid (PFOS)	0.48	U	U	0.48	1.6		ng/L	
Perfluorooctanoic acid (PFOA)	96			0.46	1.6		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	0.42	U	U	0.42	1.6		ng/L	
Perfluoropentanoic acid (PFPeA)	3.5			0.2	1.6		ng/L	
Perfluorotetradecanoic acid (PFTeA)	0.42	U	U	0.42	1.6		ng/L	
Perfluorotridecanoic acid (PFTTrDA)	0.57	U	U	0.57	1.6		ng/L	
Perfluoroundecanoic acid (PFUnA)	1.1	J	J	0.6	1.6		ng/L	
PFEESA	0.24	U	U	0.24	1.6		ng/L	
PFMBA	0.21	U	U	0.21	1.6		ng/L	
PFMPA	0.23	U	U	0.23	1.6		ng/L	

Validation Flag Abbreviations

<i>Abbreviation</i>	<i>Validation Reason</i>	<i>Category</i>
LB<RL	Laboratory blank contamination less than the reporting limit	Blank
EMPC	Estimated Maximum Possible Concentration	Matrix
SD<LCL	Matrix spike duplicate recovery criteria less than the lower control limit	Matrix
SD>UCL	Matrix spike duplicate recovery criteria greater than the upper control limit	Matrix
Sur>UCL	Surrogate recovery greater than the upper control limit	SurrogateRecovery

NASA SSFL CJ063 PFAS PO 148024177

Data Quality Evaluation

SDG 570-98433-1

Reviewer: mfesler

Method E537M

Date: 7/6/2022

Matrix WATER

Reviewed: 7/20/2022

Field Samples

Field blank association lot values: LotNumber / FieldID / SDG

NativeID	QAQC Type	Dilution	ABLotValue	EBLotValue	TBLotValue
WATER					
EBQW2401Q001	EB	1		02062201 / EBQW2401Q001 / 570-98433-1	
EBQW2402Q001	EB	1		03062202 / EBQW2402Q001 / 570-98433-1	
EBQW2403Q001	EB	1		03062201 / EBQW2403Q001 / 570-98433-1	
HAR20GW01S023	N	1	02062201 / FBQW1881Q001 / 570-98433-1	02062201 / EBQW2401Q001 / 570-98433-1	
ND125GW01S014	N	5	07062201 / FBQW1882Q001 / 570-98833-1		
ND125GW01S014	N	1	07062201 / FBQW1882Q001 / 570-98833-1		
PZ140GWD009	FD	10	07062201 / FBQW1882Q001 / 570-98833-1	03062201 / EBQW2403Q001 / 570-98433-1	
PZ140GWD009	FD	1	07062201 / FBQW1882Q001 / 570-98833-1	03062201 / EBQW2403Q001 / 570-98433-1	
PZ140GWS009	N	10	07062201 / FBQW1882Q001 / 570-98833-1	03062201 / EBQW2403Q001 / 570-98433-1	
PZ140GWS009	N	1	07062201 / FBQW1882Q001 / 570-98833-1	03062201 / EBQW2403Q001 / 570-98433-1	
RD49BGW01S012	N	1	02062201 / FBQW1881Q001 / 570-98433-1	02062201 / EBQW2401Q001 / 570-98433-1	
FBQW1881Q001	AB	1	02062201 / FBQW1881Q001 / 570-98433-1		

Associated Field Blanks (other SDGs)

NativeID	QAQC Type	Dilution	ABLotValue	EBLotValue	TBLotValue
WATER					
FBQW1882Q001	AB	1	07062201 / FBQW1882Q001 / 570-98833-1	03062201 / EBQW2403Q001 / 570-98433-1	
FBQW1882Q001	AB	1	07062201 / FBQW1882Q001 / 570-98833-1		

1. Case Narrative

Items of Interest

The following items were noted: EMPC

2. Blank Summary

Field Blanks

These analytes had Blank detects: Perfluorobutanoic acid (PFBA) (EB), Perfluoropentanoic acid (PFPeA) (EB). No flagging applied

Method Blanks

No Method Blank detects were found.

<u>Blank</u>				<u>Report</u>	<u>Lab</u>		
<u>Type</u>	<u>Blank ID</u>	<u>Analyte</u>	<u>Result</u>	<u>Limit</u>	<u>Flag</u>	<u>Units</u>	<u>SDG</u>
EB	EBQW2401Q001	Perfluorobutanoic acid (PFBA)	0.36	1.7	J	ng/L	570-98433-1
EB	EBQW2401Q001	Perfluoropentanoic acid (PFPeA)	0.34	1.7	J	ng/L	570-98433-1

3. Spikes and Duplicates

Field Duplicate

All acceptance criteria were met.

Laboratory Duplicates

None in this SDG

Matrix Spike

No MS's for this SDG. No SD's for this SDG. Perfluoropentanoic (PFPeA) and Perfluorobutanesulfonic acid (PFBS) in sample HAR20GWS023 have a S:N ratio of less than 10, and the ion ratios for PFPeS in sample RD49BGW01S012 exceeded the 50 - 150% criteria when compared to the calibration standards. Results qualified as not detected and flagged "U".

<i>Matrix</i>	<i>Sample ID</i>	<i>LR Type</i>	<i>Analyte</i>	<i>Result</i>	<i>MS/MSD Qualifier*</i>	<i>Criteria</i>
WATER			<u>Perfluorobutanesulfonic acid (PFBS)</u>			
	HAR20GW01S023			0.94 ng/L	U	EMPC
WATER			<u>Perfluoropentanesulfonic acid (PFPeS)</u>			
	RD49BGW01S012			0.49 ng/L	U	EMPC
WATER			<u>Perfluoropentanoic acid (PFPeA)</u>			
	HAR20GW01S023			2.8 ng/L	U	EMPC

4. Laboratory Control Sample

All acceptance criteria were met.

5. Surrogates

These surrogates were out of control: 13C2 4:2 FTS (ND125GW01S014). Since recovery was high and sample result ND, no flagging applied.

<u>Field ID</u>	<u>LabsampleID</u>	<u>UpperLimit</u>	<u>LowerLimit</u>	<u>Result</u>	<u>Surrogate</u>
ND125GW01S014	570-98433-5	150	50	185	13C2 4:2 FTS

6. Tuning and Mass Calibration

Tuning and Mass Calibration were not examined by AutoDV.

7. Internal Standard

Internal Standard Area/Retention Time was not examined by AutoDV.

8. Calibration Information

Initial Calibration

Initial Calibration was not examined by AutoDV.

Continuing Calibration

Continuing Calibration was not examined by AutoDV.

9. Holding Time

All acceptance criteria were met.

10. Confirmation

None for this SDG.

11. Summary

General Comments

Field Blanks: These analytes had Blank detects: Perfluorobutanoic acid (PFBA) (EB), Perfluoropentanoic acid (PFPeA) (EB). No flagging applied

Form I Review: These NativeIDs had dilutions or re-extractions that were flagged Exclude: ND125GW01S014, PZ140GWD009, PZ140GWS009. Samples were re-analyzed on a diluted basis due to concentration of target analytes

Surrogates: These surrogates were out of control: 13C2 4:2 FTS (ND125GW01S014). Since recovery was high and sample result ND, no flagging applied.

Tuning and Mass Calibration: No DV

Internal Standard Area/Retention Time: No DV

Initial Calibration: No DV

Continuing Calibration: No DV

Matrix Spike: No MS's for this SDG. No SD's for this SDG. Perfluoropentanoic (PFPeA) and Perfluorobutanesulfonic acid (PFBS) in sample HAR20GWS023 have a S:N ratio of less than 10, and the ion ratios for PFPeS in sample RD49BGW01S012 exceeded the 50 - 150% criteria when compared to the calibration standards. Results qualified as not detected and flagged "U".

VDMS4.56

Data Package Completeness Package was complete for level V validation

Forms Review/ Items of Interest

These NativeIDs had dilutions or re-extractions that were flagged Exclude: ND125GW01S014, PZ140GWD009, PZ140GWS009. Samples were re-analyzed on a diluted basis due to concentration of target analytes

COC Review

No discrepancies were noted

Final Data Flags*

*When the data evaluation process results in multiple flags, the most severe flag becomes the final data flag. All flags are from the site-specific QAPP, except the "exclude" flag that is used to designate results that are not for risk assessment (for example, a result from a dilution where the original undiluted result is appropriate).

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: HAR20GW01S023								
102FTSA	0.41	U	U	0.41	1.8		ng/L	
11CLPF3OUDSA	0.42	U	U	0.42	1.8		ng/L	
3:3 FTCA	0.38	U	U	0.38	1.8		ng/L	
42FTSA	0.32	U	U	0.32	1.8		ng/L	
5:3 FTCA	0.29	U	U	0.29	1.8		ng/L	
62FTSA	0.34	U	U	0.34	4.4		ng/L	
7:3 FTCA	0.49	U	U	0.49	1.8		ng/L	
82FTSA	0.55	U	U	0.55	1.8		ng/L	
9CLPF3ONSA	0.37	U	U	0.37	1.8		ng/L	
ADONA	0.45	U	U	0.45	1.8		ng/L	
HFPODA	0.61	U	U	0.61	3.5		ng/L	
NETFOSA	0.65	U	U	0.65	1.8		ng/L	
NETFOSAA	0.3	U	U	0.3	4.4		ng/L	
NETFOSE	0.64	U	U	0.64	1.8		ng/L	
NFDHA	0.55	U	U	0.55	1.8		ng/L	
NMEFOSA	0.65	U	U	0.65	1.8		ng/L	
NMEFOSAA	0.41	U	U	0.41	4.4		ng/L	
NMEFOSE	0.42	U	U	0.42	3.5		ng/L	
Perfluorobutanesulfonic acid (PFBS)	0.94	U	J	0.3	1.8		ng/L	EMPC (U)
Perfluorobutanoic acid (PFBA)	28			0.21	1.8		ng/L	EB>MDL (None)
Perfluorodecanesulfonic acid (PFDS)	0.49	U	U	0.49	1.8		ng/L	
Perfluorodecanoic acid (PFDA)	0.29	U	U	0.29	1.8		ng/L	
Perfluorododecanoic acid (PFDoA)	0.37	U	U	0.37	1.8		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.63	U	U	0.63	1.8		ng/L	
Perfluoroheptanoic acid (PFHpA)	5			0.42	1.8		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	0.58	J	J	0.34	1.8		ng/L	
Perfluorohexanoic acid (PFHxA)	5			0.49	1.8		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.46	U	U	0.46	1.8		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.53	U	U	0.53	1.8		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.58	U	U	0.58	1.8		ng/L	
Perfluorononanoic acid (PFNA)	0.49	U	U	0.49	1.8		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.52	J	J	0.46	1.8		ng/L	
Perfluorooctanesulfonic acid (PFOS)	0.9	J	J	0.51	1.8		ng/L	
Perfluorooctanoic acid (PFOA)	50			0.49	1.8		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	0.45	U	U	0.45	1.8		ng/L	
Perfluoropentanoic acid (PFPeA)	2.8	U		0.21	1.8		ng/L	EB>MDL (None)
	2.8	U		0.21	1.8		ng/L	EMPC (U)
Perfluorotetradecanoic acid (PFTeA)	0.45	U	U	0.45	1.8		ng/L	
Perfluorotridecanoic acid (PFTTrDA)	0.61	U	U	0.61	1.8		ng/L	
Perfluoroundecanoic acid (PFUnA)	0.64	U	U	0.64	1.8		ng/L	
PFEESA	0.26	U	U	0.26	1.8		ng/L	
PFMBA	0.23	U	U	0.23	1.8		ng/L	
PFMPA	0.25	U	U	0.25	1.8		ng/L	

Field ID: ND125GW01S014

102FTSA	0.42	SU	U	0.42	1.8		ng/L	
	2.1	exclude	U	2.1	9		ng/L	RE (exclude)

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: ND125GW01S014								
11CLPF3OUDSA	0.43	SU	U	0.43	1.8		ng/L	
	2.2	exclude	U	2.2	9		ng/L	RE (exclude)
3:3 FTCA	0.39	SU	U	0.39	1.8		ng/L	
	1.9	exclude	U	1.9	9		ng/L	RE (exclude)
42FTSA	0.32	SU	U	0.32	1.8		ng/L	Sur>UCL (none)
	1.6	exclude	U	1.6	9		ng/L	RE (exclude)
5:3 FTCA	11	S		0.3	1.8		ng/L	
	13	exclude		1.5	9		ng/L	RE (exclude)
62FTSA	3	exclude	J	1.7	22		ng/L	RE (exclude)
	2.3	SJ	J	0.34	4.5		ng/L	
7:3 FTCA	0.49	SU	U	0.49	1.8		ng/L	
	2.5	exclude	U	2.5	9		ng/L	RE (exclude)
82FTSA	0.56	SU	U	0.56	1.8		ng/L	
	2.8	exclude	U	2.8	9		ng/L	RE (exclude)
9CLPF3ONSA	0.38	SU	U	0.38	1.8		ng/L	
	1.9	exclude	U	1.9	9		ng/L	RE (exclude)
ADONA	2.3	exclude	U	2.3	9		ng/L	RE (exclude)
	0.46	SU	U	0.46	1.8		ng/L	
HFPODA	3.1	exclude	U	3.1	18		ng/L	RE (exclude)
	0.62	SU	U	0.62	3.6		ng/L	
NETFOSA	0.67	SU	U	0.67	1.8		ng/L	
	3.3	exclude	U	3.3	9		ng/L	RE (exclude)
NETFOSAA	0.31	SU	U	0.31	4.5		ng/L	
	1.5	exclude	U	1.5	22		ng/L	RE (exclude)
NETFOSE	0.65	SU	U	0.65	1.8		ng/L	
	3.2	exclude	U	3.2	9		ng/L	RE (exclude)
NFDHA	2.8	exclude	U	2.8	9		ng/L	RE (exclude)
	0.56	SU	U	0.56	1.8		ng/L	
NMEFOSA	0.67	SU	U	0.67	1.8		ng/L	
	3.3	exclude	U	3.3	9		ng/L	RE (exclude)
NMEFOSAA	0.41	SU	U	0.41	4.5		ng/L	
	2.1	exclude	U	2.1	22		ng/L	RE (exclude)
NMEFOSE	0.43	SU	U	0.43	3.6		ng/L	
	2.2	exclude	U	2.2	18		ng/L	RE (exclude)
Perfluorobutanesulfonic acid (PFBS)	2.2	exclude	J	1.5	9		ng/L	RE (exclude)
	2.8	S		0.31	1.8		ng/L	
Perfluorobutanoic acid (PFBA)	88	S		0.22	1.8		ng/L	
	90	exclude		1.1	9		ng/L	RE (exclude)
Perfluorodecanesulfonic acid (PFDS)	0.49	SU	U	0.49	1.8		ng/L	
	2.5	exclude	U	2.5	9		ng/L	RE (exclude)
Perfluorodecanoic acid (PFDA)	4.3	exclude	J	1.5	9		ng/L	RE (exclude)
	4.8	S		0.3	1.8		ng/L	
Perfluorododecanoic acid (PFDoA)	4.7	exclude	J	1.9	9		ng/L	RE (exclude)
	5.1	S		0.38	1.8		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.64	SU	U	0.64	1.8		ng/L	
	3.2	exclude	U	3.2	9		ng/L	RE (exclude)
Perfluoroheptanoic acid (PFHpA)	250	S		0.43	1.8		ng/L	
	280	exclude		2.2	9		ng/L	RE (exclude)
Perfluorohexanesulfonic acid (PFHxS)	2.4	S		0.34	1.8		ng/L	
	3.1	exclude	J	1.7	9		ng/L	RE (exclude)
Perfluorohexanoic acid (PFHxA)	400	exclude	E	0.49	1.8		ng/L	RE (exclude)
	390	S		2.5	9		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.47	SU	U	0.47	1.8		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: ND125GW01S014								
	2.3	exclude	U	2.3	9		ng/L	RE (exclude)
Perfluoro-n-octadecanoic acid (PFODA)	0.54	SU	U	0.54	1.8		ng/L	
	2.7	exclude	U	2.7	9		ng/L	RE (exclude)
Perfluorononanesulfonic acid (PFNS)	0.59	SU	U	0.59	1.8		ng/L	
	3	exclude	U	3	9		ng/L	RE (exclude)
Perfluorononanoic acid (PFNA)	6	S		0.5	1.8		ng/L	
	5.9	exclude	J	2.5	9		ng/L	RE (exclude)
Perfluorooctanesulfonamide (FOSA)	2.3	exclude	U	2.3	9		ng/L	RE (exclude)
	1.1	SJ	J	0.47	1.8		ng/L	
Perfluorooctanesulfonic acid (PFOS)	13	exclude		2.6	9		ng/L	RE (exclude)
	14	S		0.52	1.8		ng/L	
Perfluorooctanoic acid (PFOA)	1200	exclude	E	0.5	1.8		ng/L	RE (exclude)
	1200	S		2.5	9		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	0.84	SJ	J	0.46	1.8		ng/L	
	2.3	exclude	U	2.3	9		ng/L	RE (exclude)
Perfluoropentanoic acid (PFPeA)	130	exclude		1.1	9		ng/L	RE (exclude)
	120	S		0.22	1.8		ng/L	
Perfluorotetradecanoic acid (PFTeA)	2.3	exclude	U	2.3	9		ng/L	RE (exclude)
	2.2	S		0.46	1.8		ng/L	
Perfluorotridecanoic acid (PFTrDA)	2.3	exclude	U	2.3	9		ng/L	RE (exclude)
	5.3	S		0.62	1.8		ng/L	
Perfluoroundecanoic acid (PFUnA)	5.8	exclude	J	3.1	9		ng/L	RE (exclude)
	28	S		0.66	1.8		ng/L	
	29	exclude		3.3	9		ng/L	RE (exclude)
PFEESA	0.26	SU	U	0.26	1.8		ng/L	
	1.3	exclude	U	1.3	9		ng/L	RE (exclude)
PFMBA	1.1	SJ	J	0.23	1.8		ng/L	
	1.2	exclude	U	1.2	9		ng/L	RE (exclude)
PFMPA	0.6	SJ	J	0.25	1.8		ng/L	
	1.3	exclude	U	1.3	9		ng/L	RE (exclude)
Field ID: PZ140GWD009								
102FTSA	0.42	U	U	0.42	1.8		ng/L	
	4.2	exclude	U	4.2	18		ng/L	RE (exclude)
11CLPF3OUDSA	0.43	U	U	0.43	1.8		ng/L	
	4.3	exclude	U	4.3	18		ng/L	RE (exclude)
3:3 FTCA	0.38	U	U	0.38	1.8		ng/L	
	3.8	exclude	U	3.8	18		ng/L	RE (exclude)
42FTSA	0.32	U	U	0.32	1.8		ng/L	
	3.2	exclude	U	3.2	18		ng/L	RE (exclude)
5:3 FTCA	0.29	U	U	0.29	1.8		ng/L	
	2.9	exclude	U	2.9	18		ng/L	RE (exclude)
62FTSA	3.4	exclude	U	3.4	44		ng/L	RE (exclude)
	3	J	J	0.34	4.4		ng/L	
7:3 FTCA	0.49	U	U	0.49	1.8		ng/L	
	4.9	exclude	U	4.9	18		ng/L	RE (exclude)
82FTSA	3			0.55	1.8		ng/L	
	5.5	exclude	U	5.5	18		ng/L	RE (exclude)
9CLPF3ONSA	0.37	U	U	0.37	1.8		ng/L	
	3.7	exclude	U	3.7	18		ng/L	RE (exclude)
ADONA	4.5	exclude	U	4.5	18		ng/L	RE (exclude)
	0.45	U	U	0.45	1.8		ng/L	
HFPODA	6.1	exclude	U	6.1	35		ng/L	RE (exclude)
	0.61	U	U	0.61	3.5		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: PZ140GWD009								
NETFOSA	0.66	U	U	0.66	1.8		ng/L	
	6.6	exclude	U	6.6	18		ng/L	RE (exclude)
NETFOSAA	0.3	U	U	0.3	4.4		ng/L	
	3	exclude	U	3	44		ng/L	RE (exclude)
NETFOSE	0.64	U	U	0.64	1.8		ng/L	
	6.4	exclude	U	6.4	18		ng/L	RE (exclude)
NFDHA	5.5	exclude	U	5.5	18		ng/L	RE (exclude)
	0.55	U	U	0.55	1.8		ng/L	
NMEFOSA	0.66	U	U	0.66	1.8		ng/L	
	6.6	exclude	U	6.6	18		ng/L	RE (exclude)
NMEFOSAA	0.41	U	U	0.41	4.4		ng/L	
	4.1	exclude	U	4.1	44		ng/L	RE (exclude)
NMEFOSE	0.43	U	U	0.43	3.5		ng/L	
	4.3	exclude	U	4.3	35		ng/L	RE (exclude)
Perfluorobutanesulfonic acid (PFBS)	6.3			0.3	1.8		ng/L	
	7.5	exclude	J	3	18		ng/L	RE (exclude)
Perfluorobutanoic acid (PFBA)	39	exclude		2.1	18		ng/L	RE (exclude)
	43			0.21	1.8		ng/L	
Perfluorodecanesulfonic acid (PFDS)	4.9	exclude	U	4.9	18		ng/L	RE (exclude)
	0.49	U	U	0.49	1.8		ng/L	
Perfluorodecanoic acid (PFDA)	0.71	J	J	0.29	1.8		ng/L	
	2.9	exclude	U	2.9	18		ng/L	RE (exclude)
Perfluorododecanoic acid (PFDoA)	0.37	U	U	0.37	1.8		ng/L	
	3.7	exclude	U	3.7	18		ng/L	RE (exclude)
Perfluoroheptanesulfonic acid (PFHpS)	0.63	U	U	0.63	1.8		ng/L	
	6.3	exclude	U	6.3	18		ng/L	RE (exclude)
Perfluoroheptanoic acid (PFHpA)	300			0.43	1.8		ng/L	
	330	exclude		4.3	18		ng/L	RE (exclude)
Perfluorohexanesulfonic acid (PFHxS)	3.1			0.34	1.8		ng/L	
	4.1	exclude	J	3.4	18		ng/L	RE (exclude)
Perfluorohexanoic acid (PFHxA)	370	exclude		4.9	18		ng/L	RE (exclude)
	330			0.49	1.8		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.46	U	U	0.46	1.8		ng/L	
	4.6	exclude	U	4.6	18		ng/L	RE (exclude)
Perfluoro-n-octadecanoic acid (PFODA)	0.53	U	U	0.53	1.8		ng/L	
	5.3	exclude	U	5.3	18		ng/L	RE (exclude)
Perfluorononanesulfonic acid (PFNS)	0.59	U	U	0.59	1.8		ng/L	
	5.9	exclude	U	5.9	18		ng/L	RE (exclude)
Perfluorononanoic acid (PFNA)	5	exclude	U	5	18		ng/L	RE (exclude)
	2			0.5	1.8		ng/L	
Perfluorooctanesulfonamide (FOSA)	4.6	exclude	U	4.6	18		ng/L	RE (exclude)
	0.54	J	J	0.46	1.8		ng/L	
Perfluorooctanesulfonic acid (PFOS)	11			0.51	1.8		ng/L	
	13	exclude	J	5.1	18		ng/L	RE (exclude)
Perfluorooctanoic acid (PFOA)	2500	exclude	E	0.5	1.8		ng/L	RE (exclude)
	3000			5	18		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	1.3	J	J	0.45	1.8		ng/L	
	4.5	exclude	U	4.5	18		ng/L	RE (exclude)
Perfluoropentanoic acid (PFPeA)	89			0.21	1.8		ng/L	
	82	exclude		2.1	18		ng/L	RE (exclude)
Perfluorotetradecanoic acid (PFTeA)	0.45	U	U	0.45	1.8		ng/L	
	4.5	exclude	U	4.5	18		ng/L	RE (exclude)
Perfluorotridecanoic acid (PFTrDA)	0.61	U	U	0.61	1.8		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: PZ140GWD009								
Perfluoroundecanoic acid (PFUnA)	6.1	exclude	U	6.1	18		ng/L	RE (exclude)
	0.65	U	U	0.65	1.8		ng/L	
PFEESA	6.5	exclude	U	6.5	18		ng/L	RE (exclude)
	0.26	U	U	0.26	1.8		ng/L	
PFMBA	2.6	exclude	U	2.6	18		ng/L	RE (exclude)
	0.53	J	J	0.23	1.8		ng/L	
PFMPA	2.3	exclude	U	2.3	18		ng/L	RE (exclude)
	0.25	U	U	0.25	1.8		ng/L	
	2.5	exclude	U	2.5	18		ng/L	RE (exclude)
Field ID: PZ140GWS009								
102FTSA	0.42	U	U	0.42	1.8		ng/L	
	4.2	exclude	U	4.2	18		ng/L	RE (exclude)
11CLPF3OUDSA	0.43	U	U	0.43	1.8		ng/L	
	4.3	exclude	U	4.3	18		ng/L	RE (exclude)
3:3 FTCA	0.39	U	U	0.39	1.8		ng/L	
	3.9	exclude	U	3.9	18		ng/L	RE (exclude)
42FTSA	0.32	U	U	0.32	1.8		ng/L	
	3.2	exclude	U	3.2	18		ng/L	RE (exclude)
5:3 FTCA	0.3	U	U	0.3	1.8		ng/L	
	3	exclude	U	3	18		ng/L	RE (exclude)
62FTSA	3.4	exclude	U	3.4	45		ng/L	RE (exclude)
	0.34	U	U	0.34	4.5		ng/L	
7:3 FTCA	0.49	U	U	0.49	1.8		ng/L	
	4.9	exclude	U	4.9	18		ng/L	RE (exclude)
82FTSA	0.56	U	U	0.56	1.8		ng/L	
	5.6	exclude	U	5.6	18		ng/L	RE (exclude)
9CLPF3ONSA	0.38	U	U	0.38	1.8		ng/L	
	3.8	exclude	U	3.8	18		ng/L	RE (exclude)
ADONA	4.6	exclude	U	4.6	18		ng/L	RE (exclude)
	0.46	U	U	0.46	1.8		ng/L	
HFPODA	6.2	exclude	U	6.2	36		ng/L	RE (exclude)
	0.62	U	U	0.62	3.6		ng/L	
NETFOSA	0.66	U	U	0.66	1.8		ng/L	
	6.6	exclude	U	6.6	18		ng/L	RE (exclude)
NETFOSAA	0.3	U	U	0.3	4.5		ng/L	
	3	exclude	U	3	45		ng/L	RE (exclude)
NETFOSE	0.65	U	U	0.65	1.8		ng/L	
	6.5	exclude	U	6.5	18		ng/L	RE (exclude)
NFDHA	5.6	exclude	U	5.6	18		ng/L	RE (exclude)
	0.56	U	U	0.56	1.8		ng/L	
NMEFOSA	0.66	U	U	0.66	1.8		ng/L	
	6.6	exclude	U	6.6	18		ng/L	RE (exclude)
NMEFOSAA	0.41	U	U	0.41	4.5		ng/L	
	4.1	exclude	U	4.1	45		ng/L	RE (exclude)
NMEFOSE	0.43	U	U	0.43	3.6		ng/L	
	4.3	exclude	U	4.3	36		ng/L	RE (exclude)
Perfluorobutanesulfonic acid (PFBS)	5.7	exclude	J	3	18		ng/L	RE (exclude)
	7.4			0.3	1.8		ng/L	
Perfluorobutanoic acid (PFBA)	41	exclude		2.2	18		ng/L	RE (exclude)
	43			0.22	1.8		ng/L	
Perfluorodecanesulfonic acid (PFDS)	0.49	U	U	0.49	1.8		ng/L	
	4.9	exclude	U	4.9	18		ng/L	RE (exclude)

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: PZ140GWS009								
Perfluorodecanoic acid (PFDA)	0.73	J	J	0.3	1.8		ng/L	
	3	exclude	U	3	18		ng/L	RE (exclude)
Perfluorododecanoic acid (PFDoA)	0.38	U	U	0.38	1.8		ng/L	
	3.8	exclude	U	3.8	18		ng/L	RE (exclude)
Perfluoroheptanesulfonic acid (PFHpS)	0.64	U	U	0.64	1.8		ng/L	
	6.4	exclude	U	6.4	18		ng/L	RE (exclude)
Perfluoroheptanoic acid (PFHpA)	270			0.43	1.8		ng/L	
	300	exclude		4.3	18		ng/L	RE (exclude)
Perfluorohexanesulfonic acid (PFHxS)	2.7			0.34	1.8		ng/L	
	4.7	exclude	J	3.4	18		ng/L	RE (exclude)
Perfluorohexanoic acid (PFHxA)	340			0.49	1.8		ng/L	
	330	exclude		4.9	18		ng/L	RE (exclude)
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.47	U	U	0.47	1.8		ng/L	
	4.7	exclude	U	4.7	18		ng/L	RE (exclude)
Perfluoro-n-octadecanoic acid (PFODA)	0.54	U	U	0.54	1.8		ng/L	
	5.4	exclude	U	5.4	18		ng/L	RE (exclude)
Perfluorononanesulfonic acid (PFNS)	0.59	U	U	0.59	1.8		ng/L	
	5.9	exclude	U	5.9	18		ng/L	RE (exclude)
Perfluorononanoic acid (PFNA)	5	exclude	U	5	18		ng/L	RE (exclude)
	1.9			0.5	1.8		ng/L	
Perfluorooctanesulfonamide (FOSA)	4.7	exclude	U	4.7	18		ng/L	RE (exclude)
	0.47	U	U	0.47	1.8		ng/L	
Perfluorooctanesulfonic acid (PFOS)	10			0.52	1.8		ng/L	
	10	exclude	J	5.2	18		ng/L	RE (exclude)
Perfluorooctanoic acid (PFOA)	2400	exclude	E	0.5	1.8		ng/L	RE (exclude)
	2900			5	18		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	1.4	J	J	0.46	1.8		ng/L	
	4.6	exclude	U	4.6	18		ng/L	RE (exclude)
Perfluoropentanoic acid (PFPeA)	83			0.22	1.8		ng/L	
	75	exclude		2.2	18		ng/L	RE (exclude)
Perfluorotetradecanoic acid (PFTeA)	0.46	U	U	0.46	1.8		ng/L	
	4.6	exclude	U	4.6	18		ng/L	RE (exclude)
Perfluorotridecanoic acid (PFTrDA)	0.62	U	U	0.62	1.8		ng/L	
	6.2	exclude	U	6.2	18		ng/L	RE (exclude)
Perfluoroundecanoic acid (PFUnA)	0.65	U	U	0.65	1.8		ng/L	
	6.5	exclude	U	6.5	18		ng/L	RE (exclude)
PFEESA	0.26	U	U	0.26	1.8		ng/L	
	2.6	exclude	U	2.6	18		ng/L	RE (exclude)
PFMBA	0.51	J	J	0.23	1.8		ng/L	
	2.3	exclude	U	2.3	18		ng/L	RE (exclude)
PFMPA	0.25	U	U	0.25	1.8		ng/L	
	2.5	exclude	U	2.5	18		ng/L	RE (exclude)
Field ID: RD49BGW01S012								
102FTSA	0.41	U	U	0.41	1.7		ng/L	
11CLPF3OUDSA	0.42	U	U	0.42	1.7		ng/L	
3:3 FTCA	0.37	U	U	0.37	1.7		ng/L	
42FTSA	0.31	U	U	0.31	1.7		ng/L	
5:3 FTCA	0.29	U	U	0.29	1.7		ng/L	
62FTSA	1	J	J	0.33	4.3		ng/L	
7:3 FTCA	0.48	U	U	0.48	1.7		ng/L	
82FTSA	0.54	U	U	0.54	1.7		ng/L	
9CLPF3ONSA	0.36	U	U	0.36	1.7		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: RD49BGW01S012								
ADONA	0.44	U	U	0.44	1.7		ng/L	
HFPODA	0.6	U	U	0.6	3.5		ng/L	
NETFOSA	0.64	U	U	0.64	1.7		ng/L	
NETFOSAA	0.3	U	U	0.3	4.3		ng/L	
NETFOSE	0.63	U	U	0.63	1.7		ng/L	
NFDHA	0.54	U	U	0.54	1.7		ng/L	
NMEFOSA	0.64	U	U	0.64	1.7		ng/L	
NMEFOSAA	0.4	U	U	0.4	4.3		ng/L	
NMEFOSE	0.42	U	U	0.42	3.5		ng/L	
Perfluorobutanesulfonic acid (PFBS)	2.1			0.3	1.7		ng/L	
Perfluorobutanoic acid (PFBA)	5.8			0.21	1.7		ng/L	EB>MDL (None)
Perfluorodecanesulfonic acid (PFDS)	0.48	U	U	0.48	1.7		ng/L	
Perfluorodecanoic acid (PFDA)	0.85	J	J	0.29	1.7		ng/L	
Perfluorododecanoic acid (PFDoA)	0.36	U	U	0.36	1.7		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.62	U	U	0.62	1.7		ng/L	
Perfluoroheptanoic acid (PFHpA)	5.9			0.42	1.7		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	0.49	J	J	0.33	1.7		ng/L	
Perfluorohexanoic acid (PFHxA)	9.9			0.48	1.7		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.45	U	U	0.45	1.7		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.52	U	U	0.52	1.7		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.57	U	U	0.57	1.7		ng/L	
Perfluorononanoic acid (PFNA)	0.57	J	J	0.49	1.7		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.45	U	U	0.45	1.7		ng/L	
Perfluorooctanesulfonic acid (PFOS)	2			0.5	1.7		ng/L	
Perfluorooctanoic acid (PFOA)	17			0.49	1.7		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	0.49	U	JI	0.44	1.7		ng/L	EMPC (U)
Perfluoropentanoic acid (PFPeA)	2.5			0.21	1.7		ng/L	EB>MDL (None)
Perfluorotetradecanoic acid (PFTeA)	0.44	U	U	0.44	1.7		ng/L	
Perfluorotridecanoic acid (PFTTrDA)	0.6	U	U	0.6	1.7		ng/L	
Perfluoroundecanoic acid (PFUnA)	0.63	U	U	0.63	1.7		ng/L	
PFEESA	0.25	U	U	0.25	1.7		ng/L	
PFMBA	0.23	U	U	0.23	1.7		ng/L	
PFMPA	0.24	U	U	0.24	1.7		ng/L	

Validation Flag Abbreviations

<i>Abbreviation</i>	<i>Validation Reason</i>	<i>Category</i>
EMPC	Estimated Maximum Possible Concentration	Matrix
RE	Re-extraction and/or re-analysis	Re-analysis
Sur>UCL	Surrogate recovery greater than the upper control limit	SurrogateRecovery

NASA SSFL CJ063 PFAS PO 148024177

Data Quality Evaluation

SDG 570-98833-1

Reviewer: mfesler

Method E537M

Date: 7/6/2022

Matrix WATER

Reviewed: 7/6/2022

Field Samples

Field blank association lot values: LotNumber / FieldID / SDG

NativeID	QAQC Type	Dilution	ABLotValue	EBLotValue	TBLotValue
WATER					
EBQW2404Q001	EB	1		06062201 / EBQW2404Q001 / 570-98833-1	
EBQW2405Q001	EB	1		06062202 / EBQW2405Q001 / 570-98833-1	
EBQW2406Q001	EB	1		07062201 / EBQW2406Q001 / 570-98833-1	
FBQW1882Q001	AB	1	07062201 / FBQW1882Q001 / 570-98833-1		
HAR09GW01S020	N	1	02062201 / FBQW1881Q001 / 570-98433-1	06062201 / EBQW2404Q001 / 570-98833-1	
HAR11GW01S022	N	1	02062201 / FBQW1881Q001 / 570-98433-1	06062201 / EBQW2404Q001 / 570-98833-1	
HAR21GW01S019	N	1	02062201 / FBQW1881Q001 / 570-98433-1	06062201 / EBQW2404Q001 / 570-98833-1	
RD26GWS005	N	1	07062201 / FBQW1882Q001 / 570-98833-1	07062201 / EBQW2406Q001 / 570-98833-1	
RD26GWS005MS	MS	1	07062201 / FBQW1882Q001 / 570-98833-1	07062201 / EBQW2406Q001 / 570-98833-1	
RD26GWS005SD	SD	1	07062201 / FBQW1882Q001 / 570-98833-1	07062201 / EBQW2406Q001 / 570-98833-1	

Associated Field Blanks (other SDGs)

NativeID	QAQC Type	Dilution	ABLotValue	EBLotValue	TBLotValue
WATER					
FBQW1881Q001	AB	1	02062201 / FBQW1881Q001 / 570-98433-1	06062201 / EBQW2404Q001 / 570-98833-1	

1. Case Narrative

Items of Interest

The following items were noted: Sur<LCL; EMPC

2. Blank Summary

Field Blanks

No Field Blank detects were found.

Method Blanks

No Method Blank detects were found.

3. Spikes and Duplicates

Field Duplicate

No FD Associated.

Laboratory Duplicates

None in this SDG

Matrix Spike

All MS acceptance criteria were met. These SD's were out of control: ADONA (SD - RD26GWS005SD). Since recovery was high and sample result ND; no flagging applied to native sample result. All RPD acceptance criteria were met. Perfluoropentanoic (PFPeA) in sample HAR21GW01S019 had a S:N ratio of less than 10. Result qualified as not detected and flagged "U".

Matrix	Sample ID	LR Type	Analyte	Result	MS/MSD Qualifier*	Criteria
WATER			<u>ADONA</u>			
	RD26GWS005			0.45 ng/L	none	SD>UCL
WATER			<u>Perfluoropentanoic acid (PFPeA)</u>			
	HAR21GW01S019			3.6 ng/L	U	EMPC

4. Laboratory Control Sample

These LCS analytes were out of control: NETFOSA (BS). Since recovery was high and sample results were ND, no flagging applied. No spike dupes in this SDG.

Matrix	QAQC Type	Field ID	Analyte	Recovery	Lower Limit	Upper Limit
WATER	BS	LCS 320-595874/2-A	NETFOSA	113	83	110

5. Surrogates

These surrogates were out of control: 13C2 PFTeDA (HAR09GW01S020), 13C4 PFBA (HAR09GW01S020), 13C4 PFBA (HAR11GW01S022), d9-N-EtFOSE-M (HAR09GW01S020).

Field ID	LabsampleID	UpperLimit	LowerLimit	Result	Surrogate
HAR09GW01S020	570-98833-5	150	50	45	13C2 PFTeDA
HAR09GW01S020	570-98833-5	150	50	46	13C4 PFBA
HAR09GW01S020	570-98833-5	150	50	45	d9-N-EtFOSE-M
HAR11GW01S022	570-98833-6	150	50	36	13C4 PFBA

6. Tuning and Mass Calibration

Tuning and Mass Calibration were not examined by AutoDV.

7. Internal Standard

Internal Standard Area/Retention Time was not examined by AutoDV.

8. Calibration Information

Initial Calibration

Initial Calibration was not examined by AutoDV.

Continuing Calibration

Continuing Calibration was not examined by AutoDV.

9. Holding Time

All acceptance criteria were met.

10. Confirmation

None for this SDG.

11. Summary

General Comments

Field Duplicates: No FD Associated.

Form I Review: No samples were excluded for dilutions or re-extractions.

Surrogates: These surrogates were out of control: 13C2 PFTeDA (HAR09GW01S020), 13C4 PFBA (HAR09GW01S020), 13C4 PFBA (HAR11GW01S022), d9-N-EtFOSE-M (HAR09GW01S020).

Laboratory Control Sample: These LCS analytes were out of control: NETFOSA (BS). Since recovery was high and sample results were ND, no flagging applied. No spike dupes in this SDG.

VDMS4.56

Data Package Completeness Package was complete for level V validation

Forms Review/ Items of Interest

No samples were excluded for dilutions or re-extractions.

COC Review

No discrepancies were noted

Final Data Flags*

*When the data evaluation process results in multiple flags, the most severe flag becomes the final data flag. All flags are from the site-specific QAPP, except the "exclude" flag that is used to designate results that are not for risk assessment (for example, a result from a dilution where the original undiluted result is appropriate).

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: HAR09GW01S020								
102FTSA	0.42	U	U	0.42	1.8		ng/L	
11CLPF3OUDSA	0.43	U	U	0.43	1.8		ng/L	
3:3 FTCA	0.39	U	U	0.39	1.8		ng/L	
42FTSA	0.32	U	U	0.32	1.8		ng/L	
5:3 FTCA	0.3	U	U	0.3	1.8		ng/L	
62FTSA	0.34	U	U	0.34	4.5		ng/L	
7:3 FTCA	0.49	U	U	0.49	1.8		ng/L	
82FTSA	0.56	U	U	0.56	1.8		ng/L	
9CLPF3ONSA	0.38	U	U	0.38	1.8		ng/L	
ADONA	0.46	U	U	0.46	1.8		ng/L	
HFPODA	0.62	U	U	0.62	3.6		ng/L	
NETFOSA	0.67	U	U *+	0.67	1.8		ng/L	InvalidLabFlag (U)
	0.67	U	U *+	0.67	1.8		ng/L	LCS>UCL (none)
NETFOSAA	0.31	U	U	0.31	4.5		ng/L	
NETFOSE	0.65	UJ	U	0.65	1.8		ng/L	Sur<LCL (UJ)
NFDHA	0.56	U	U	0.56	1.8		ng/L	
NMEFOSA	0.67	U	U	0.67	1.8		ng/L	
NMEFOSAA	0.41	U	U	0.41	4.5		ng/L	
NMEFOSE	0.43	U	U	0.43	3.6		ng/L	
Perfluorobutanesulfonic acid (PFBS)	5			0.31	1.8		ng/L	
Perfluorobutanoic acid (PFBA)	44	J		0.22	1.8		ng/L	Sur<LCL (J)
Perfluorodecanesulfonic acid (PFDS)	0.49	U	U	0.49	1.8		ng/L	
Perfluorodecanoic acid (PFDA)	0.3	U	U	0.3	1.8		ng/L	
Perfluorododecanoic acid (PFDoA)	0.38	U	U	0.38	1.8		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.64	U	U	0.64	1.8		ng/L	
Perfluoroheptanoic acid (PFHpA)	5.6			0.43	1.8		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	1.4	J	J	0.34	1.8		ng/L	
Perfluorohexanoic acid (PFHxA)	9.2			0.49	1.8		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.47	U	U	0.47	1.8		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.54	U	U	0.54	1.8		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.59	U	U	0.59	1.8		ng/L	
Perfluorononanoic acid (PFNA)	0.5	U	U	0.5	1.8		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.47	U	U	0.47	1.8		ng/L	
Perfluorooctanesulfonic acid (PFOS)	0.52	U	U	0.52	1.8		ng/L	
Perfluorooctanoic acid (PFOA)	67			0.5	1.8		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	0.66	J	J	0.46	1.8		ng/L	
Perfluoropentanoic acid (PFPeA)	7.3			0.22	1.8		ng/L	
Perfluorotetradecanoic acid (PFTeA)	0.46	UJ	U	0.46	1.8		ng/L	Sur<LCL (UJ)
Perfluorotridecanoic acid (PFTTrDA)	0.62	U	U	0.62	1.8		ng/L	
Perfluoroundecanoic acid (PFUnA)	0.66	U	U	0.66	1.8		ng/L	
PFEESA	0.26	U	U	0.26	1.8		ng/L	
PFMBA	0.23	UJ	U	0.23	1.8		ng/L	Sur<LCL (UJ)
PFMPA	0.25	U	U	0.25	1.8		ng/L	
Field ID: HAR11GW01S022								
102FTSA	0.42	U	U	0.42	1.8		ng/L	
11CLPF3OUDSA	0.43	U	U	0.43	1.8		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: HAR11GW01S022								
3:3 FTCA	0.38	U	U	0.38	1.8		ng/L	
42FTSA	0.32	U	U	0.32	1.8		ng/L	
5:3 FTCA	0.3	U	U	0.3	1.8		ng/L	
62FTSA	0.34	U	U	0.34	4.5		ng/L	
7:3 FTCA	0.49	U	U	0.49	1.8		ng/L	
82FTSA	0.55	U	U	0.55	1.8		ng/L	
9CLPF3ONSA	0.38	U	U	0.38	1.8		ng/L	
ADONA	0.46	U	U	0.46	1.8		ng/L	
HFPODA	0.62	U	U	0.62	3.6		ng/L	
NETFOSA	0.66	U	U *+	0.66	1.8		ng/L	InvalidLabFlag (U)
	0.66	U	U *+	0.66	1.8		ng/L	LCS>UCL (none)
NETFOSAA	0.3	U	U	0.3	4.5		ng/L	
NETFOSE	0.64	U	U	0.64	1.8		ng/L	
NFDHA	0.55	U	U	0.55	1.8		ng/L	
NMEFOSA	0.66	U	U	0.66	1.8		ng/L	
NMEFOSAA	0.41	U	U	0.41	4.5		ng/L	
NMEFOSE	0.43	U	U	0.43	3.6		ng/L	
Perfluorobutanesulfonic acid (PFBS)	2.1			0.3	1.8		ng/L	
Perfluorobutanoic acid (PFBA)	70	J		0.21	1.8		ng/L	Sur<LCL (J)
Perfluorodecanesulfonic acid (PFDS)	0.49	U	U	0.49	1.8		ng/L	
Perfluorodecanoic acid (PFDA)	0.3	U	U	0.3	1.8		ng/L	
Perfluorododecanoic acid (PFDoA)	0.38	U	U	0.38	1.8		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.64	U	U	0.64	1.8		ng/L	
Perfluoroheptanoic acid (PFHpA)	6.8			0.43	1.8		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	1.7	J	J	0.34	1.8		ng/L	
Perfluorohexanoic acid (PFHxA)	7.8			0.49	1.8		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.47	U	U	0.47	1.8		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.54	U	U	0.54	1.8		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.59	U	U	0.59	1.8		ng/L	
Perfluorononanoic acid (PFNA)	0.51	J	J	0.5	1.8		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.47	U	U	0.47	1.8		ng/L	
Perfluorooctanesulfonic acid (PFOS)	0.52	U	U	0.52	1.8		ng/L	
Perfluorooctanoic acid (PFOA)	120			0.5	1.8		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	0.46	U	U	0.46	1.8		ng/L	
Perfluoropentanoic acid (PFPeA)	6.2			0.21	1.8		ng/L	
Perfluorotetradecanoic acid (PFTeA)	0.46	U	U	0.46	1.8		ng/L	
Perfluorotridecanoic acid (PFTrDA)	0.62	U	U	0.62	1.8		ng/L	
Perfluoroundecanoic acid (PFUnA)	0.65	U	U	0.65	1.8		ng/L	
PFEESA	0.26	U	U	0.26	1.8		ng/L	
PFMBA	0.23	UJ	U	0.23	1.8		ng/L	Sur<LCL (UJ)
PFMPA	0.25	U	U	0.25	1.8		ng/L	
Field ID: HAR21GW01S019								
102FTSA	2.4	U	U	2.4	10		ng/L	
11CLPF3OUDSA	2.4	U	U	2.4	10		ng/L	
3:3 FTCA	2.2	U	U	2.2	10		ng/L	
42FTSA	1.8	U	U	1.8	10		ng/L	
5:3 FTCA	1.7	U	U	1.7	10		ng/L	
62FTSA	1.9	U	U	1.9	25		ng/L	
7:3 FTCA	2.8	U	U	2.8	10		ng/L	
82FTSA	3.1	U	U	3.1	10		ng/L	
9CLPF3ONSA	2.1	U	U	2.1	10		ng/L	
ADONA	2.6	U	U	2.6	10		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: HAR21GW01S019								
HFPODA	3.5	U	U	3.5	20		ng/L	
NETFOSA	3.7	U	U *+	3.7	10		ng/L	InvalidLabFlag (U)
	3.7	U	U *+	3.7	10		ng/L	LCS>UCL (none)
NETFOSAA	1.7	U	U	1.7	25		ng/L	
NETFOSE	3.6	U	U	3.6	10		ng/L	
NFDHA	3.1	U	U	3.1	10		ng/L	
NMEFOSA	3.7	U	U	3.7	10		ng/L	
NMEFOSAA	2.3	U	U	2.3	25		ng/L	
NMEFOSE	2.4	U	U	2.4	20		ng/L	
Perfluorobutanesulfonic acid (PFBS)	3.5	J	J	1.7	10		ng/L	
Perfluorobutanoic acid (PFBA)	48			1.2	10		ng/L	
Perfluorodecanesulfonic acid (PFDS)	2.8	U	U	2.8	10		ng/L	
Perfluorodecanoic acid (PFDA)	1.7	U	U	1.7	10		ng/L	
Perfluorododecanoic acid (PFDoA)	2.1	U	U	2.1	10		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	3.6	U	U	3.6	10		ng/L	
Perfluoroheptanoic acid (PFHpA)	5.4	J	J	2.4	10		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	1.9	U	U	1.9	10		ng/L	
Perfluorohexanoic acid (PFHxA)	9.2	J	J	2.8	10		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	2.6	U	U	2.6	10		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	3	U	U	3	10		ng/L	
Perfluorononanesulfonic acid (PFNS)	3.3	U	U	3.3	10		ng/L	
Perfluorononanoic acid (PFNA)	2.8	U	U	2.8	10		ng/L	
Perfluorooctanesulfonamide (FOSA)	2.6	U	U	2.6	10		ng/L	
Perfluorooctanesulfonic acid (PFOS)	2.9	U	U	2.9	10		ng/L	
Perfluorooctanoic acid (PFOA)	57			2.8	10		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	2.6	U	U	2.6	10		ng/L	
Perfluoropentanoic acid (PFPeA)	3.6	U	J	1.2	10		ng/L	EMPC (U)
Perfluorotetradecanoic acid (PFTeA)	2.6	U	U	2.6	10		ng/L	
Perfluorotridecanoic acid (PFTrDA)	3.5	U	U	3.5	10		ng/L	
Perfluoroundecanoic acid (PFUnA)	3.7	U	U	3.7	10		ng/L	
PFEESA	1.5	U	U	1.5	10		ng/L	
PFMBA	1.3	U	U	1.3	10		ng/L	
PFMPA	1.4	U	U	1.4	10		ng/L	
Field ID: RD26GWS005								
102FTSA	0.42	U	U	0.42	1.8		ng/L	
11CLPF3OUDSA	0.43	U	U	0.43	1.8		ng/L	
3:3 FTCA	0.38	U	U	0.38	1.8		ng/L	
42FTSA	0.32	U	U	0.32	1.8		ng/L	
5:3 FTCA	0.29	U	U	0.29	1.8		ng/L	
62FTSA	0.34	U	U	0.34	4.4		ng/L	
7:3 FTCA	0.49	U	U	0.49	1.8		ng/L	
82FTSA	0.55	U	U	0.55	1.8		ng/L	
9CLPF3ONSA	0.37	U	U	0.37	1.8		ng/L	
ADONA	0.45	U	U F1	0.45	1.8		ng/L	InvalidLabFlag (U)
	0.45	U	U F1	0.45	1.8		ng/L	SD>UCL (none)
HFPODA	0.61	U	U	0.61	3.5		ng/L	
NETFOSA	0.66	U	U *+	0.66	1.8		ng/L	InvalidLabFlag (U)
	0.66	U	U *+	0.66	1.8		ng/L	LCS>UCL (none)
NETFOSAA	0.3	U	U	0.3	4.4		ng/L	
NETFOSE	0.64	U	U	0.64	1.8		ng/L	
NFDHA	0.55	U	U	0.55	1.8		ng/L	
NMEFOSA	0.66	U	U	0.66	1.8		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: RD26GWS005								
NMEFOSAA	0.41	U	U	0.41	4.4		ng/L	
NMEFOSE	0.43	U	U	0.43	3.5		ng/L	
Perfluorobutanesulfonic acid (PFBS)	3.6			0.3	1.8		ng/L	
Perfluorobutanoic acid (PFBA)	25			0.21	1.8		ng/L	
Perfluorodecanesulfonic acid (PFDS)	0.49	U	U	0.49	1.8		ng/L	
Perfluorodecanoic acid (PFDA)	0.29	U	U	0.29	1.8		ng/L	
Perfluorododecanoic acid (PFDoA)	0.37	U	U	0.37	1.8		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.63	U	U	0.63	1.8		ng/L	
Perfluoroheptanoic acid (PFHpA)	34			0.43	1.8		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	11			0.34	1.8		ng/L	
Perfluorohexanoic acid (PFHxA)	49			0.49	1.8		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.46	U	U	0.46	1.8		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.53	U	U	0.53	1.8		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.58	U	U	0.58	1.8		ng/L	
Perfluorononanoic acid (PFNA)	1.6	J	J	0.5	1.8		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.46	U	U	0.46	1.8		ng/L	
Perfluorooctanesulfonic acid (PFOS)	6.1			0.51	1.8		ng/L	
Perfluorooctanoic acid (PFOA)	14			0.5	1.8		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	3.5			0.45	1.8		ng/L	
Perfluoropentanoic acid (PFPeA)	75			0.21	1.8		ng/L	
Perfluorotetradecanoic acid (PFTeA)	0.45	U	U	0.45	1.8		ng/L	
Perfluorotridecanoic acid (PFTrDA)	0.61	U	U	0.61	1.8		ng/L	
Perfluoroundecanoic acid (PFUnA)	0.65	U	U	0.65	1.8		ng/L	
PFEESA	0.26	U	U	0.26	1.8		ng/L	
PFMBA	0.23	U	U	0.23	1.8		ng/L	
PFMPA	0.25	U	U	0.25	1.8		ng/L	

Validation Flag Abbreviations

<i>Abbreviation</i>	<i>Validation Reason</i>	<i>Category</i>
LCS>UCL	LCS recovery greater than the upper control limit	LaboratoryControlSample
EMPC	Estimated Maximum Possible Concentration	Matrix
SD>UCL	Matrix spike duplicate recovery criteria greater than the upper control limit	Matrix
InvalidLabFlag	Removed invalid laboratory flag	Miscellaneous
Sur<LCL	Surrogate recovery less than the lower control limit	SurrogateRecovery

NASA SSFL CJ063 PFAS PO 148024177

Data Quality Evaluation

SDG 570-104710-1

Reviewer: mfesler

Method E537M

Date: 9/13/2022

Matrix WATER

Reviewed: 9/13/2022

Field Samples

Field blank association lot values: LotNumber / FieldID / SDG

NativeID	QAQC Type	Dilution	ABLotValue	EBLotValue	TBLotValue
WATER					
EBQW2807Q001	EB	1		28072202 / EBQW2807Q001 / 570-104710-1	
EBQW2808Q001	EB	1		29072203 / EBQW2808Q001 / 570-104710-1	
FBQW1884Q001	AB	1	29072201 / FBQW1884Q001 / 570-104710-1		
RD26GWS006	N	1	29072201 / FBQW1884Q001 / 570-104710-1	28072202 / EBQW2807Q001 / 570-104710-1	
RD83GW01D012	FD	1		29072203 / EBQW2808Q001 / 570-104710-1	
RD83GW01S012	N	1		29072203 / EBQW2808Q001 / 570-104710-1	

1. Case Narrative

Items of Interest

There were no items of concern

2. Blank Summary

Field Blanks

No Field Blank detects were found.

Method Blanks

No Method Blank detects were found.

3. Spikes and Duplicates

Field Duplicate

All acceptance criteria were met.

Laboratory Duplicates

None in this SDG

Matrix Spike

No MS's for this SDG. No SD's for this SDG.

4. Laboratory Control Sample

All acceptance criteria were met. No spike dupes in this SDG.

5. Surrogates

All acceptance criteria were met.

6. Tuning and Mass Calibration

Tuning and Mass Calibration were not examined by AutoDV.

7. Internal Standard

Internal Standard Area/Retention Time was not examined by AutoDV.

8. Calibration Information

Initial Calibration

Initial Calibration was not examined by AutoDV.

Continuing Calibration

Continuing Calibration was not examined by AutoDV.

9. Holding Time

All acceptance criteria were met.

10. Confirmation

None for this SDG.

11. Summary

General Comments

Form I Review: No samples were excluded for dilutions or re-extractions.

Tuning and Mass Calibration: Tuning and Mass Calibration were not examined by AutoDV.

Internal Standard Area/Retention Time: Internal Standard Area/Retention Time was not examined by AutoDV.

Initial Calibration: Initial Calibration was not examined by AutoDV.

Continuing Calibration: Continuing Calibration was not examined by AutoDV.

Matrix Spike: No MS's for this SDG. No SD's for this SDG.

COC: No discrepancies were noted

VDMS4.58

Data Package Completeness Package was complete for level V validation

Forms Review/ Items of Interest

No samples were excluded for dilutions or re-extractions.

COC Review

No discrepancies were noted

Final Data Flags*

*When the data evaluation process results in multiple flags, the most severe flag becomes the final data flag. All flags are from the site-specific QAPP, except the "exclude" flag that is used to designate results that are not for risk assessment (for example, a result from a dilution where the original undiluted result is appropriate).

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: RD26GWS006								
102FTSA	0.43	U	U	0.43	1.8		ng/L	
11CLPF3OUDSA	0.44	U	U	0.44	1.8		ng/L	
3:3 FTCA	0.39	U	U	0.39	1.8		ng/L	
42FTSA	0.33	U	U	0.33	1.8		ng/L	
5:3 FTCA	0.3	U	U	0.3	1.8		ng/L	
62FTSA	0.35	U	U	0.35	4.5		ng/L	
7:3 FTCA	0.5	U	U	0.5	1.8		ng/L	
82FTSA	0.56	U	U	0.56	1.8		ng/L	
9CLPF3ONSA	0.38	U	U	0.38	1.8		ng/L	
ADONA	0.46	U	U	0.46	1.8		ng/L	
HFPODA	0.63	U	U	0.63	3.6		ng/L	
NETFOSA	0.67	U	U	0.67	1.8		ng/L	
NETFOSAA	0.31	U	U	0.31	4.5		ng/L	
NETFOSE	0.65	U	U	0.65	1.8		ng/L	
NFDHA	0.56	U	U	0.56	1.8		ng/L	
NMEFOSA	0.67	U	U	0.67	1.8		ng/L	
NMEFOSAA	0.42	U	U	0.42	4.5		ng/L	
NMEFOSE	0.44	U	U	0.44	3.6		ng/L	
Perfluorobutanesulfonic acid (PFBS)	3.3			0.31	1.8		ng/L	
Perfluorobutanoic acid (PFBA)	24			0.22	1.8		ng/L	
Perfluorodecanesulfonic acid (PFDS)	0.5	U	U	0.5	1.8		ng/L	
Perfluorodecanoic acid (PFDA)	0.3	U	U	0.3	1.8		ng/L	
Perfluorododecanoic acid (PFDoA)	0.38	U	U	0.38	1.8		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.64	U	U	0.64	1.8		ng/L	
Perfluoroheptanoic acid (PFHpA)	32			0.44	1.8		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	10			0.35	1.8		ng/L	
Perfluorohexanoic acid (PFHxA)	49			0.5	1.8		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.47	U	U	0.47	1.8		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.55	U	U	0.55	1.8		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.6	U	U	0.6	1.8		ng/L	
Perfluorononanoic acid (PFNA)	0.94	J	J	0.51	1.8		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.47	U	U	0.47	1.8		ng/L	
Perfluorooctanesulfonic acid (PFOS)	4.2			0.53	1.8		ng/L	
Perfluorooctanoic acid (PFOA)	12			0.51	1.8		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	3.6			0.46	1.8		ng/L	
Perfluoropentanoic acid (PFPeA)	73			0.22	1.8		ng/L	
Perfluorotetradecanoic acid (PFTeA)	0.46	U	U	0.46	1.8		ng/L	
Perfluorotridecanoic acid (PFTTrDA)	0.63	U	U	0.63	1.8		ng/L	
Perfluoroundecanoic acid (PFUnA)	0.66	U	U	0.66	1.8		ng/L	
PFEEESA	0.26	U	U	0.26	1.8		ng/L	
PFMBA	0.24	U	U	0.24	1.8		ng/L	
PFMPA	0.25	U	U	0.25	1.8		ng/L	
Field ID: RD83GW01D012								
102FTSA	0.43	U	U	0.43	1.8		ng/L	
11CLPF3OUDSA	0.44	U	U	0.44	1.8		ng/L	
3:3 FTCA	0.39	U	U	0.39	1.8		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: RD83GW01D012								
42FTSA	0.33	U	U	0.33	1.8		ng/L	
5:3 FTCA	0.3	U	U	0.3	1.8		ng/L	
62FTSA	0.35	U	U	0.35	4.6		ng/L	
7:3 FTCA	0.5	U	U	0.5	1.8		ng/L	
82FTSA	0.57	U	U	0.57	1.8		ng/L	
9CLPF3ONSA	0.38	U	U	0.38	1.8		ng/L	
ADONA	0.47	U	U	0.47	1.8		ng/L	
HFPODA	0.63	U	U	0.63	3.6		ng/L	
NETFOSA	0.68	U	U	0.68	1.8		ng/L	
NETFOSAA	0.31	U	U	0.31	4.6		ng/L	
NETFOSE	0.66	U	U	0.66	1.8		ng/L	
NFDHA	0.57	U	U	0.57	1.8		ng/L	
NMEFOSA	0.68	U	U	0.68	1.8		ng/L	
NMEFOSAA	0.42	U	U	0.42	4.6		ng/L	
NMEFOSE	0.44	U	U	0.44	3.6		ng/L	
Perfluorobutanesulfonic acid (PFBS)	0.31	U	U	0.31	1.8		ng/L	
Perfluorobutanoic acid (PFBA)	0.23	J	J	0.22	1.8		ng/L	
Perfluorodecanesulfonic acid (PFDS)	0.5	U	U	0.5	1.8		ng/L	
Perfluorodecanoic acid (PFDA)	0.3	U	U	0.3	1.8		ng/L	
Perfluorododecanoic acid (PFDoA)	0.38	U	U	0.38	1.8		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.65	U	U	0.65	1.8		ng/L	
Perfluoroheptanoic acid (PFHpA)	0.44	U	U	0.44	1.8		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	0.35	U	U	0.35	1.8		ng/L	
Perfluorohexanoic acid (PFHxA)	0.5	U	U	0.5	1.8		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.47	U	U	0.47	1.8		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.55	U	U	0.55	1.8		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.6	U	U	0.6	1.8		ng/L	
Perfluorononanoic acid (PFNA)	0.51	U	U	0.51	1.8		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.47	U	U	0.47	1.8		ng/L	
Perfluorooctanesulfonic acid (PFOS)	0.53	U	U	0.53	1.8		ng/L	
Perfluorooctanoic acid (PFOA)	0.51	U	U	0.51	1.8		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	0.47	U	U	0.47	1.8		ng/L	
Perfluoropentanoic acid (PFPeA)	0.22	U	U	0.22	1.8		ng/L	
Perfluorotetradecanoic acid (PFTeA)	0.47	U	U	0.47	1.8		ng/L	
Perfluorotridecanoic acid (PFTrDA)	0.63	U	U	0.63	1.8		ng/L	
Perfluoroundecanoic acid (PFUnA)	0.67	U	U	0.67	1.8		ng/L	
PFEESA	0.26	U	U	0.26	1.8		ng/L	
PFMBA	0.24	U	U	0.24	1.8		ng/L	
PFMPA	0.26	U	U	0.26	1.8		ng/L	
Field ID: RD83GW01S012								
102FTSA	0.43	U	U	0.43	1.8		ng/L	
11CLPF3OUDSA	0.44	U	U	0.44	1.8		ng/L	
3:3 FTCA	0.4	U	U	0.4	1.8		ng/L	
42FTSA	0.33	U	U	0.33	1.8		ng/L	
5:3 FTCA	0.31	U	U	0.31	1.8		ng/L	
62FTSA	0.35	U	U	0.35	4.6		ng/L	
7:3 FTCA	0.51	U	U	0.51	1.8		ng/L	
82FTSA	0.57	U	U	0.57	1.8		ng/L	
9CLPF3ONSA	0.39	U	U	0.39	1.8		ng/L	
ADONA	0.47	U	U	0.47	1.8		ng/L	
HFPODA	0.64	U	U	0.64	3.7		ng/L	
NETFOSA	0.68	U	U	0.68	1.8		ng/L	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: RD83GW01S012								
NETFOSAA	0.31	U	U	0.31	4.6		ng/L	
NETFOSE	0.67	U	U	0.67	1.8		ng/L	
NFDHA	0.57	U	U	0.57	1.8		ng/L	
NMEFOSA	0.68	U	U	0.68	1.8		ng/L	
NMEFOSAA	0.43	U	U	0.43	4.6		ng/L	
NMEFOSE	0.44	U	U	0.44	3.7		ng/L	
Perfluorobutanesulfonic acid (PFBS)	0.31	U	U	0.31	1.8		ng/L	
Perfluorobutanoic acid (PFBA)	0.25	J	J	0.22	1.8		ng/L	
Perfluorodecanesulfonic acid (PFDS)	0.51	U	U	0.51	1.8		ng/L	
Perfluorodecanoic acid (PFDA)	0.31	U	U	0.31	1.8		ng/L	
Perfluorododecanoic acid (PFDoA)	0.39	U	U	0.39	1.8		ng/L	
Perfluoroheptanesulfonic acid (PFHpS)	0.66	U	U	0.66	1.8		ng/L	
Perfluoroheptanoic acid (PFHpA)	0.44	U	U	0.44	1.8		ng/L	
Perfluorohexanesulfonic acid (PFHxS)	0.35	U	U	0.35	1.8		ng/L	
Perfluorohexanoic acid (PFHxA)	0.51	U	U	0.51	1.8		ng/L	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.48	U	U	0.48	1.8		ng/L	
Perfluoro-n-octadecanoic acid (PFODA)	0.55	U	U	0.55	1.8		ng/L	
Perfluorononanesulfonic acid (PFNS)	0.61	U	U	0.61	1.8		ng/L	
Perfluorononanoic acid (PFNA)	0.52	U	U	0.52	1.8		ng/L	
Perfluorooctanesulfonamide (FOSA)	0.48	U	U	0.48	1.8		ng/L	
Perfluorooctanesulfonic acid (PFOS)	0.54	U	U	0.54	1.8		ng/L	
Perfluorooctanoic acid (PFOA)	0.52	U	U	0.52	1.8		ng/L	
Perfluoropentanesulfonic acid (PFPeS)	0.47	U	U	0.47	1.8		ng/L	
Perfluoropentanoic acid (PFPeA)	0.22	U	U	0.22	1.8		ng/L	
Perfluorotetradecanoic acid (PFTeA)	0.47	U	U	0.47	1.8		ng/L	
Perfluorotridecanoic acid (PFTrDA)	0.64	U	U	0.64	1.8		ng/L	
Perfluoroundecanoic acid (PFUnA)	0.68	U	U	0.68	1.8		ng/L	
PFEESA	0.27	U	U	0.27	1.8		ng/L	
PFMBA	0.24	U	U	0.24	1.8		ng/L	
PFMPA	0.26	U	U	0.26	1.8		ng/L	

Validated Form I

Site Inspection of Per- and Polyfluoroalkyl Substances in Soil Data Usability Assessment Report

March 2023

Prepared for
National Aeronautics and Space Administration

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Acronyms and Abbreviations

Acronym	Definition
EPA	U.S. Environmental Protection Agency
FD	field duplicate
QAPP	<i>Quality Assurance Project Plan, Santa Susana Field Laboratory, RCRA Facility Investigation, Surficial Media Operable Unit</i>
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
MDL	method detection limit
MRL	method reporting limit
MS	matrix spike
MSD	matrix spike duplicate
NASA	National Aeronautics and Space Administration
PARCCS	precision, accuracy, representativeness, completeness, comparability, and sensitivity
PFAS	polyfluoroalkyl substances
RPD	relative percent difference
SDG	sample delivery group
SSFL	Santa Susana Field Laboratory

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1. Introduction

The objective of this data usability assessment report is to assess the data quality of analytical results for soil samples collected during site inspection procedure activities at the National Aeronautics and Space Administration (NASA) Santa Susana Field Laboratory (SSFL) in Ventura County, California. Samples were collected and analyzed to evaluate the presence or absence of per- and polyfluoroalkyl substances (PFAS) in soil near and/or within the areas of potential concern. The data may also be used to support future activities such as feasibility studies, risk assessments, fate-and-transport modeling, and remedial actions.

Individual method requirements and guidelines from the *Quality Assurance Project Plan, Santa Susana Field Laboratory, RCRA Facility Investigation, Surficial Media Operable Unit (SSFL QAPP) (MECx 2013)* as well as the QAPP Addendum (Jacobs 2022) were used in this assessment. The SSFL QAPP and QAPP Addendum include the quality assurance/quality control procedures to confirm the quality of field and laboratory data and to evaluate that project work meets the data quality objectives for the intended use of the data for NASA SSFL site inspection procedures. This report is intended as a general data quality evaluation designed to summarize data issues and to provide an overall data usability assessment.

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2. Analytical Data

This data usability assessment report covers 26 environmental soil samples, 2 soil field duplicate (FD) samples, 4 ambient blanks, and 12 field equipment blanks. These samples were reported under seven sample delivery groups (SDGs) by the laboratory. Samples were collected between November 9 and November 17, 2022. One method was used to analyze the environmental samples and is listed in Table 2-1. The analysis was performed by Eurofins TestAmerica in West Sacramento, California. Samples were collected and delivered by overnight carrier to the laboratory.

The chains of custody and case narratives associated with each of the laboratory SDGs are included in the laboratory data summary reports provided in Appendix A to this report. The data validation summary reports associated with each of these SDGs are provided in Appendix B (both appendixes are provided electronically).

All the data were evaluated on an SDG-by-SDG basis by CH2M HILL, Inc. chemists for data quality using Level V validation, as specified in the SSFL QAPP (MECx 2013). The data evaluation included a review of the following information:

- Chain-of-custody documentation
- Holding time compliance
- Required quality control samples at the specified frequencies
- Flagging for analytical blanks
- Laboratory control sample/laboratory control sample duplicates (LCS/LCSD)
- Surrogate spike recoveries for organic analyses
- Matrix spike/matrix spike duplicate (MS/MSD) recoveries
- Other method-specific criteria as defined by the SSFL QAPP or QAPP Addendum

Field samples also were reviewed to determine field compliance and data quality issues. This review included field blanks and FDs.

Data flags were assigned according to the SSFL QAPP (MECx 2013). These flags, as well as the reason for each flag, are uploaded into the NASA electronic database and are included in the data validation summary reports (provided in Appendix B). Multiple flags are routinely applied to specific sample method/matrix/analyte combinations, but there will be only one final flag. A final flag is applied to the data and is the most conservative of the applied validation flags. The final flag also includes matrix and blank sample impacts. The data flags are those listed in the SSFL QAPP and are defined as follows:

- J = Analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample (estimated).
- R = Data are unusable. The sample results are rejected because of serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.
- U = Analyte was analyzed for but not detected above the reported sample quantitation limit, or this analyte was considered not detected because of laboratory or field blank contamination.
- UJ = Analyte was analyzed for but not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

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- N = Analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration.
- S = Screening level data only; the associated numerical value represents its approximate concentration.

3. Findings

The following sections provide overall summaries of the data validation findings. Specific analyte results and samples that were qualified are discussed in the data validation summary reports (Appendix B).

3.1 Calibration

Level V validation, as defined in the SSFL QAPP, does not include review of initial or continuing calibration information. The laboratories did not report any criteria exceedances in the case narrative.

3.2 Holding Times

Analytical holding times were evaluated against the criteria listed in Table B-3 of the QAPP Addendum (Jacobs, 2022). For methods requiring both sample preparation and analysis, the preparation/extraction holding time will be calculated from the time of sampling to the initiation of preparation/extraction. The analysis holding time will be calculated from the time of completion of preparation/extraction to the time of completion of the analysis, including any required dilutions, confirmation analysis, and reanalysis.

Holding times were generally met, with the exceptions listed in Table 3-1.

Data qualification flags were applied to the individual results as indicated in Section 2. Four non-detected results were qualified as estimated and flagged "UJ." Four samples were re-analyzed for 7:3 FTCA because of laboratory quality control issues. Sample results that have been qualified as estimated due to holding time exceptions are usable for project decisions; however, data users should consider the impact to any result that is qualified as estimated because it may contain a bias and should be accounted for during the decision-making process.

3.3 Analytical Blanks

Method blanks are used to monitor each preparation and/or analytical batch for interference and/or contamination from glassware, reagents, and other potential contaminant sources within the laboratory. A method blank is an analyte-free matrix (laboratory reagent water for aqueous samples) to which all reagents are added in the same amount or proportions as are added to samples. It is processed through the entire sample preparation and analytical procedures along with the samples in the batch. At least one method blank is prepared for each analytical batch of 20 samples or fewer.

Method blanks were analyzed at the required frequency and frequency and were generally free of contamination that would affect the sample results, with the exceptions listed in Table 3-2.

Data qualification flags were applied to the individual results as indicated in Section 2. Eight associated detected sample concentrations were less than 5 times the blank concentration and were qualified as nondetect and flagged "U." Overall, the blank qualification was considered to be acceptable; therefore, the data is usable.

3.4 Field Blanks

Field blanks (ambient blanks) and equipment rinsate blanks are collected to monitor interference and/or contamination from potential sources associated with field collection activities. Ambient blanks were collected each week for this sampling event. The first ambient blank was collected during sampling of the first well of this event, and subsequent ambient blanks were collected at separate areas of potential concern at the discretion of the Field Team Leader. The laboratory-grade PFAS-free water will be directly poured into the sample containers. Equipment rinse blanks will be collected for each type of non-dedicated sampling equipment and each type of dedicated tubing used for the sampling event. One equipment blank will be collected from portable pump and water level meter probe each day. The laboratory-grade PFAS-free water will be placed into a decontaminated or new container or bag consisting of approved material. The pump and water level meter probe will be placed into the water and the pump operated to fill the sample containers. One blank from each type of new tubing will also be collected to evaluate potential PFAS contamination from the manufacturer. The laboratory-grade PFAS-free water will be poured over/into the tubing and into the sample containers. Ambient blanks and equipment rinsate blanks were collected and analyzed at the required frequency, and were free of contamination that would affect the sample results.

3.5 Field Duplicates

An FD, or collocated sample, is an independent sample collected as close as possible to the original sample from the same source under identical conditions. FDs are to be collected in the field for 5% or more of the samples collected for analysis during each sampling event, by matrix and method, and are used to document sampling and analytical precision and representativeness. Precision is expressed in terms of the relative percent difference (RPD) between the native and FD sample results. The RPD criterion for FDs for waters is 35%. Qualification is performed on the native sample and associated FD results in accordance with the SSFL QAPP (MECx 2013). FDs were collected and analyzed at the required frequency and precision criteria were acceptable.

3.6 Matrix Spike Samples

A sample matrix fortified with known quantities of specific compounds is called a "matrix spike." It is subjected to the same preparation and analytical procedures as the native sample. The results of MS/MSD analyses provide information about the possible influence of the matrix on either the accuracy or precision of the measurements. Samples used for MS/MSD analysis were either collected in the field for 5% of the samples collected for analysis during each sampling event, by matrix and method, or were reported by the laboratory as part of their analytical batch requirements. Qualification of sample results because of MS/MSD recovery or precision exceedances was done on a sample batch basis for inorganic methods and on the parent sample only for organic methods in accordance with the SSFL QAPP (MECx 2013). Accuracy and precision criteria are listed in Table B-4 of the QAPP Addendum (Jacobs 2022).

Accuracy and precision limits were generally met, with the exception listed in Table 3-3.

Data qualification flags were applied to the individual results as indicated in Section 2. Four non-detected results were qualified as estimated and flagged "UJ." Sample results that have been qualified as estimated due to accuracy or precision criteria are usable for project decisions; however, data users should consider the impact to any result that is qualified as estimated because it may contain a bias and should be considered during the decision-making process.

3.7 Surrogates

Surrogates, or extracted internal standards, are organic analytes that behave similarly to the analytes of interest or have been chemically altered (that is, chemically deuterated), but are not expected to occur naturally in the samples. They are spiked into the standards, field samples, and laboratory quality control samples prior to sample preparation. The results of surrogate spikes provide additional information about the possible influence of the matrix on the accuracy of the measurements for organic analyses only. Accuracy criteria are listed in Table B-4 of the QAPP Addendum (Jacobs 2022). Accuracy limits were generally met, with the exception listed in Table 3-4.

Data qualification flags were applied to the individual results as indicated in Section 2. A total of 15 detected results were qualified as estimated and flagged "J," and 64 non-detected results were qualified as estimated and flagged "UJ." Sample results that have been qualified as estimated due to accuracy criteria are usable for project decisions; however, data users should consider the impact to any result that is qualified as estimated because it may contain a bias and should be considered during the decision-making process.

Six non-detected results were rejected from project use and were flagged "R" (6 flagged results out of 1,176 total results; approximately 0.5%). 6:2 FTSA and/or 7:3 FTCA were recovered less than 10% in 5 soil samples, indicating a significant matrix effect was evident in recovering those analytes from the sample matrix. The data results will not be used during the decision-making process.

3.8 Laboratory Control Samples

LCSs are used to monitor method performance for a given analyte in each matrix. An LCS is an analyte-free matrix (laboratory reagent water for aqueous samples or Ottawa sand for soil samples) spiked with known amounts of analytes that come from a source different than that used for calibration standards. Target analytes specified in the QAPP Addendum are spiked into the LCS. It is processed through the entire sample preparation and analytical procedures along with the samples in the batch. At least one LCS is prepared for each analytical batch of 20 samples or fewer. Accuracy and precision criteria are listed in Table B-4 of the QAPP Addendum (Jacobs 2022). Laboratory control samples and LCSs were analyzed at the required frequency.

Accuracy and precision limits were generally met, with the exception listed in Table 3-5.

Data qualification flags were applied to the individual results as indicated in Section 2. A total of 23 non-detected results were qualified as estimated and flagged "UJ." Sample results that have been qualified as estimated due to accuracy or precision criteria are usable for project decisions; however, data users should consider the impact to any result that is qualified as estimated because it may contain a bias and should be considered during the decision-making process.

3.9 Laboratory Duplicates

A laboratory duplicate is a separate sample aliquot that is subjected to the same preparation and analytical procedures as the native sample. Laboratory duplicates were analyzed to measure the precision of sample results reported as required by the analytical method. Precision is expressed in terms of the RPD between the native and laboratory duplicate sample results. The RPD criterion for laboratory duplicates is 20%. Laboratory duplicates were analyzed at the required frequency, and precision criteria were acceptable.

3.10 Tentatively Identified Compounds

Tentatively identified compounds were not evaluated for any samples reported at this site.

3.11 Other

The detections of one or more PFAS in three samples were qualified as not detected because either the signal to noise ratio of greater than 10 was not met for the primary quantitation ion, or the transition ion criteria of 50% to 150% were not met. Four sample results were qualified.

3.12 Chain of Custody

No discrepancies were noted. Chain-of-custody documentation is provided in the laboratory data summary reports included in Appendix A.

3.13 Overall Assessment

The final activity in the data quality evaluation is an assessment of whether the data meet the data quality objectives. The goal of this assessment is to demonstrate that a sufficient number of representative samples were collected, and the resulting analytical data can be used to support the decision-making process. The precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS) are addressed in the SSFL QAPP (MECx 2013). The following summary highlights the data evaluation findings:

- Precision of the data was verified through the review of the field and laboratory data quality indicators that include FD, LCS/LCSD, MS/MSD, and laboratory duplicate RPDs. Precision was acceptable.
- Accuracy of the data was verified through the review of the LCS, MS/MSD, and surrogate standard recoveries, as well as the evaluation of the method blank/field blank data. Accuracy was generally acceptable, with the exception of some analytical results being qualified as estimated detected and non-detected results resulting from LCS, MS/MSD, or surrogate recovery issues. Overall, 103 results out of 1,176 total results (approximately 8.8%) were qualified for accuracy exceptions. Six results were rejected from project use resulting from low surrogate recovery caused by the sample matrix. Analytical/field blank data were generally free of contamination, with eight analytical results being qualified as nondetect. Overall, 8 results out of 1,176 total results (approximately 0.7%) were qualified for blank contamination.
- Representativeness of the data was verified through the sample's collection, storage, and the verification of holding time compliance. Several analytical results were qualified as estimated non-detects due to holding time exceptions. All other data were reported from analyses within the USEPA-recommended holding times. Overall, 4 out of 1,176 total results (approximately 0.3%) were qualified.
- Comparability of the data was verified through the use of standard EPA analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.
- Sensitivity is a measurement based upon the analytical instrument method reporting limits (MRLs) determined by the laboratory. The analytical reporting limits were determined based upon the completion of instrument-specific method detection limit (MDL) studies performed annually in accordance with the *Code of Federal Regulations* Title 40, Part 136, Appendix B (EPA 1984). The

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MRLs are generally established by multiplying the MDL by a factor of 3 to 5 as recommended by generally accepted laboratory practice and is further supported by the lowest-level analytical standard in the initial calibration process. Sensitivity is ensured through compliance with the MRLs specified in the GM-QAPP. Any nondetect results that were reported by the laboratory, or were flagged nondetect because of blank contamination, have been evaluated against the project screening levels as discussed in the work plan.

- Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as data that are not rejected for project use. The completeness goal of 90% was met for all analytes and methods, as indicated in Table 3-6.
- Evaluation of 100% of the chemical data was performed by using the SSFL QAPP as a guide for data quality evaluation. The overall completeness was met and no other systematic protocol errors were identified during the monitoring of the field or laboratory efforts. This outcome, along with the PARCCS evaluation, demonstrates that the overall quality of the analytical program and laboratory are sufficient to meet the project data quality objectives.

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4. References

Jacobs. 2022. *Groundwater Quality Assurance Project Plan Addendum, Site Inspection of Per- and Polyfluoroalkyl Substances in Soil and Groundwater.*

MEC^x, LP (MEC^x). 2013. *Quality Assurance Project Plan, SSFL RFI Surficial Media Operable Unit, Revision 5.* March

U.S. Environmental Protection Agency (EPA). 1984. *Guidelines Establishing Test Procedures for the Analysis of Pollutants. Code of Federal Regulations.* Title 40, Part 136, Appendix B. Government Printing Office. Washington, D.C. March.

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Tables

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Table 2-1. Analytical Parameters by Method

SSFL NASA Site Inspection of Per- and Polyfluoroalkyl Substances in Soil, Data Usability Assessment, SSFL, Ventura County, California

Parameter	Method	Laboratory
PFAS	E537M	Eurofins TestAmerica West Sacramento

PFAS = polyfluoroalkyl substances

Table 3-1. Holding Time Qualification Summary

SSFL NASA Site Inspection of Per- and Polyfluoroalkyl Substances in Soil, Data Usability Assessment, SSFL, Ventura County, California

Method	Total Number of Samples	Total Number of Sample Results	Number of Results Flagged as Estimated Detect or Nondetect as a Result of Holding Time Exceptions		Number of Results Flagged as Rejected as a Result of Holding Time Exceptions	Percentage of Qualified Results
			J Flag	UJ Flag	R Flag	
E537M PFAS	28	1,176	0	4	0	<1

< = less than

PFAS = polyfluoroalkyl substances

Table 3-2. Analytical Blank Qualification Summary

SSFL NASA Site Inspection of Per- and Polyfluoroalkyl Substances in Soil, Data Usability Assessment, SSFL, Ventura County, California

Method	Total Number of Samples	Total Number of Sample Results	Number of Results Flagged as Estimated Detect or Nondetect as a Result of Analytical Blank Contamination		Percentage of Qualified Results
			U Flag	J Flag	
E537M PFAS	28	1,176	8	0	<1

< = less than

PFAS = polyfluoroalkyl substances

Table 3-3. Matrix Spike/Matrix Spike Duplicate Qualification Summary

SSFL NASA Site Inspection of Per- and Polyfluoroalkyl Substances in Soil, Data Usability Assessment, SSFL, Ventura County, California

Method	Number of Native/MS/MSD Pairs	Number of Associated Native Sample Results	Number of Results Flagged as Estimated Detect or Nondetect as a Result of MS/MSD Recovery and/or Precision Exceptions		Number of Results Flagged as Rejected as a Result of MS/MSD Recovery Exceptions	Percentage of Qualified Results
			J Flag	UJ Flag		
E537M PFAS	5	210	0	4	0	2

MS/MSD = matrix spike/matrix spike duplicate

PFAS = polyfluoroalkyl substances

Table 3-4. Surrogate Spike Qualification Summary

SSFL NASA Site Inspection of Per- and Polyfluoroalkyl Substances in Soil, Data Usability Assessment, SSFL, Ventura County, California

Method	Total Number of Samples	Total Number of Sample Results	Number of Results Flagged as Estimated Detect or Nondetect as a Result of Surrogate Spike Recovery Exceptions		Number of Results Flagged as Rejected as a Result of Surrogate Spike Recovery Exceptions	Percentage of Qualified Results
			J Flag	UJ Flag	R Flag	
E537M PFAS	28	1,176	15	64	6	7

PFAS = polyfluoroalkyl substances

Table 3-5. Laboratory Control Sample Qualification Summary

SSFL NASA Site Inspection of Per- and Polyfluoroalkyl Substances in Soil, Data Usability Assessment, SSFL, Ventura County, California

Method	Total Number of Samples	Total Number of Sample Results	Number of Results Flagged as Estimated Detect or Nondetect as a Result of LCS Recovery and/or Precision Exceptions		Number of Results Flagged as Rejected as a Result of LCS Recovery Exceptions	Percentage of Qualified Results
			J Flag	UJ Flag	R Flag	
E537M PFAS	28	1,176	0	23	0	2

MS/MSD = matrix spike/matrix spike duplicate

PFAS = polyfluoroalkyl substances

Table 3-6. Site Completeness Summary

SSFL NASA Site Inspection of Per- and Polyfluoroalkyl Substances in Soil, Data Usability Assessment, SSFL, Ventura County, California

Method	Total Number of Samples ^[a]	Total Number of Results	Number of Qualified Results as Nondetect ^[b]		Number of Qualified Results as Estimated ^[c]		Number of Qualified Results as Rejected ^[d]		Percent Completeness	
			Number	Percent	Number	Percent	Number	Percent	Number	Percent ^[e]
E537M PFAS	28	1,176	8	0.7	103	8.8	6	0.5	1,170	99.5

^[a] Includes field duplicate and normal samples.

^[b] Results flagged U.

^[c] Results flagged J or UJ.

^[d] Results flagged R.

^[e] Percent complete = (reported results-unusable results/reported results) multiplied by 100.

PFAS = polyfluoroalkyl substances

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Appendix A
Data Summary Reports, Chains of Custody,
Case Narratives
Available upon request

Due to file size, please contact Lori Manes, lori.manes@nasa.gov,
for a copy of the Appendix A reports.

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Appendix B

Data Validation Reports

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Appendix B. Data Validation Reports

Data validation reports presented in this appendix (as separate electronic files) were generated using a Microsoft Access-based validation tool created by CH2M HILL, Inc. (a wholly owned subsidiary of Jacobs). The reports provide a detailed summary of the data validation findings, as well as the final analytical results for each sample, including any data qualification flags that may have been applied. The qualification flag is followed by an annotated validation reason code for applying the flag. Table B-1 lists the validation reason code, a brief description of the reason code, and the corresponding Santa Susana Field Laboratory (SSFL) qualification code.

Table B-1. Validation Details

*Installation of Slant Well ND-118 Former Liquid Oxygen Plant Area of Impacted Groundwater
Santa Susana Field Laboratory, Ventura County, California*

Validation Reason Code	Description	SSFL Qualification Code
>ICLinearRange	Result greater than linear calibration range	C
AB<RL	Ambient blank concentration less than RL	F
AB>MDL	Ambient blank concentration greater than the MDL	F
AB>RL	Ambient blank concentration greater than the RL	F
CCB<RL	Continuing calibration blank concentration less than RL	B
CCB>RL	Continuing calibration blank concentration exceeds RL	B
CCV<LCL	Continuing calibration recovery less than lower control limit	C
CCV<RF	SPCC exceeds RF > 0.300 criteria	R
CCV>UCL	Continuing calibration recovery greater than upper control limit	C
CF>RPD	Confirmation precision exceeded	*DVR
Coelution	Compounds were reported combined on one column	*DVR
EB<RL	Equipment blank concentration less than the RL	F
EB>MDL	Equipment blank concentration greater than the MDL	F
EB>RL	Equipment blank concentration greater than the RL	F
EMPC	Estimated maximum possible concentration	*DVR
exclude	Data not used; another value is appropriate, or data were not requested	D
FB<RL	Field blank concentration less than RL	F
FB>RL	Field blank concentration greater than the RL	F
FD>RPD	Field duplicate exceeds RPD criteria	*DVR
HTa>UCL	Analysis holding time exceeded	H
HTp>UCL	Preparation/extraction holding time exceeded	H

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Validation Reason Code	Description	SSFL Qualification Code
IC RRF	Initial calibration relative response factor below LCL	R
IC%RSD	Initial calibration RSD exceeded	C
ICB<RL	Initial calibration blank concentration less than the RL	B
ICVS<LCL	Second source verification standard recovery less than lower control limit	C
ICVS>UCL	Second source verification std. recovery greater than upper control limit	C
ImproperPres	Sample improperly preserved or handled prior to analysis	*DVR
InvalidLabFlag	Remove lab flag	(No flag)
IS<LCL	Internal standard response less than lower control limit	I
IS>UCL	Internal standard response greater than upper control limit	I
Lab Dup RPD	Lab duplicate exceeds RPD criteria	E
LB<RL	Laboratory blank contamination less than the RL	B
LB>MDL	Laboratory blank contamination greater than the MDL	B
LB>RL	Laboratory blank contamination greater than the RL	B
LCS<LCL	LCS recovery less than lower control limit	L
LCS>UCL	LCS recovery greater than upper control limit	L
LCSRPD	LCS RPD criteria exceeded	L
MS<LCL	Matrix spike recovery less than lower limit	Q
MS>UCL	Matrix spike recovery greater than upper limit	Q
MSRPD	Matrix spike RPD criteria exceedance	Q
NoLCS	No LCS in the analytical batch	L
PostSpike<LCL	Post-spike recovery less than the lower control limit	P
PostSpike>UCL	Post-spike recovery greater than the upper control limit	P
RE	Re-extraction and/or reanalysis	D
RemoveBFlag	Lab B flag removed; analyte not detected in sample	\$
SD<LCL	Matrix spike duplicate recovery criteria less than lower limit	Q
SD>UCL	Matrix spike duplicate recovery criteria greater than upper limit	Q
SerlDil>UCL	Serial Dilution %D greater than the upper control limit	A
Sur<LCL	Surrogate recovery less than lower limit	S
Sur>UCL	Surrogate recovery greater than upper limit	S
TB<RL	Trip blank concentration less than RL	T

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Validation Reason Code	Description	SSFL Qualification Code
TB>RL	Trip blank concentration greater than the RL	T
TEMP>8C	Temperature blank greater than 8 degrees Celsius	*DVR
TIC	Tentatively identified compound	(No flag)

%D = percent difference

LCL = lower control limit

LCS = laboratory control sample

LCSD = laboratory control sample duplicate

MDL = method detection limit

RF = response factor

RL = reporting limit

RPD = relative percent difference

RSD = relative standard deviation

SPCC = system performance check compound

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NASA SSFL CJ063 PFAS PO 148024177

Data Quality Evaluation

SDG: 570-116845-1

Validator/Date:

mfesler

1/9/2023

Method: E537M

Reviewer/Date:

mfesler

1/10/2023

Matrix: WATER

Field Samples

Field blank association lot values: LotNumber / FieldID / SDG

NativeID	QAQC Type	Dilution	EB Lot	TB Lot	AB Lot
WATER					
EBQW2809Q001	EB	1	07112201 / EBQW2809Q001 / 570-116845-1		
EBQW2810Q001	EB	1			
EBQW2811Q001	EB	1			
EBQW2812Q001	EB	1			
EBQW2813Q001	EB	1	07112201 / EBQW2809Q001 / 570-116845-1		

1. Case Narrative / Items of Interest

There were no items of concern

2. Blank Summary

Field Blanks

No Field Blank detects were found.

Method Blanks

No Method Blank detects were found.

3. Spikes and Duplicates

Field Duplicate

No FD Associated.

Laboratory Duplicates

None in this SDG

Matrix Spike

No MS's for this SDG. No SD's for this SDG.

4. Laboratory Control Sample

All acceptance criteria were met.

5. Surrogates

All acceptance criteria were met.

6. Tuning and Mass Calibration

No DV

7. Internal Standard

No DV

8. Calibration Information

Initial Calibration

No DV

Continuing Calibration

No DV

9. Holding Time

All acceptance criteria were met.

10. Confirmation

None for this SDG.

11. Summary

General Comments

Field Duplicates: No FD Associated.

Form I Review: No samples were excluded for dilutions or re-extractions.

Tuning and Mass Calibration: No DV

Internal Standard Area/Retention Time: No DV

Initial Calibration: No DV

Continuing Calibration: No DV

Matrix Spike: No MS's for this SDG. No SD's for this SDG.

COC: No discrepancies were noted

VDMS4.59

Data Package Completeness Package was complete for level V validation

Forms Review/ Items of Interest

No samples were excluded for dilutions or re-extractions.

COC Review

No discrepancies were noted

NASA SSFL CJ063 PFAS PO 148024177

Data Quality Evaluation

SDG: 570-116847-1

Validator/Date:

mfesler

1/9/2023

Method: E537M

Reviewer/Date:

mfesler

1/10/2023

Matrix: Soil/Water

Field Samples

Field blank association lot values: LotNumber / FieldID / SDG

NativeID	QAQC Type	Dilution	EB Lot	TB Lot	AB Lot
SOIL					
A2BS1243D001	FD	1	09112201 / EBQW2814Q001 / 570-116847-1		09112201 / FBQW1885Q001 / 570-116847-1
A2BS1243S001	N	1	09112201 / EBQW2814Q001 / 570-116847-1		09112201 / FBQW1885Q001 / 570-116847-1
A2BS1243S002	N	1	09112201 / EBQW2814Q001 / 570-116847-1		09112201 / FBQW1885Q001 / 570-116847-1
A2BS1244S001	N	1	09112201 / EBQW2814Q001 / 570-116847-1		09112201 / FBQW1885Q001 / 570-116847-1
WATER					
EBQW2814Q001	EB	1	09112201 / EBQW2814Q001 / 570-116847-1		
FBQW1885Q001	AB	1			09112201 / FBQW1885Q001 / 570-116847-1

1. Case Narrative / Items of Interest

The following items were noted: Hta>UCL; LCS<LCL; Sur<LCL

2. Blank Summary

Field Blanks

No Field Blank detects were found.

Method Blanks

No Method Blank detects were found.

3. Spikes and Duplicates

Field Duplicate

All acceptance criteria were met.

Laboratory Duplicates

None in this SDG

Matrix Spike

No MS's for this SDG. No SD's for this SDG.

4. Laboratory Control Sample

These LCS analytes were out of control: 3:3 FTCA (BS), NETFOSA (BS). For NETFOSA, since recovery was high and sample results were ND, no flagging applied. All RPD acceptance criteria were met.

Matrix	QAQC Type	Field ID	Analyte	Recovery	Lower Limit	Upper Limit
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<u>Matrix</u>	<u>Type</u>	<u>Field ID</u>	<u>Analyte</u>	<u>Recovery</u>	<u>Limit</u>	<u>Limit</u>
SOIL	BS	LCS 320-633847/2-A	3:3 FTCA	54	70	130
SOIL	BS	LCS 320-633847/2-A	NETFOSA	115	83	110

5. Surrogates

These surrogates were out of control: 13C4 PFBA (LCS 320-633847/2-A), 13C-6:2 FTCA (A2BS1243D001), 13C-6:2 FTCA (A2BS1243S001), 13C-6:2 FTCA (A2BS1243S002), 13C-6:2 FTCA (A2BS1244S001), 13C-8:2 FTCA (A2BS1243D001RE), 13C-8:2 FTCA (A2BS1243S001RE), 13C-8:2 FTCA (A2BS1243S002RE), 13C-8:2 FTCA (A2BS1244S001RE).

<u>Field ID</u>	<u>LabsampleID</u>	<u>LowerLimit</u>	<u>UpperLimit</u>	<u>Result</u>	<u>Surrogate</u>
A2BS1243D001	570-116847-1	50	150	44	13C-6:2 FTCA
A2BS1243D001RE	570-116847-1	50	150	46	13C-8:2 FTCA
A2BS1243S001	570-116847-2	50	150	47	13C-6:2 FTCA
A2BS1243S001RE	570-116847-2	50	150	48	13C-8:2 FTCA
A2BS1243S002	570-116847-3	50	150	36	13C-6:2 FTCA
A2BS1243S002RE	570-116847-3	50	150	32	13C-8:2 FTCA
A2BS1244S001	570-116847-4	50	150	45	13C-6:2 FTCA
A2BS1244S001RE	570-116847-4	50	150	47	13C-8:2 FTCA
LCS 320-633847/2-A	LCS 320-633847/	50	150	47	13C4 PFBA

6. Tuning and Mass Calibration

No DV

7. Internal Standard

No DV

8. Calibration Information

Initial Calibration

No DV

Continuing Calibration

No DV

9. Holding Time

These NativeIDs exceeded holding time: A2BS1243D001, A2BS1243S001, A2BS1243S002, A2BS1244S001.

10. Confirmation

None for this SDG.

11. Summary

General Comments

Form I Review: These NativeIDs had dilutions or re-extractions that were flagged Exclude: A2BS1243D001, A2BS1243S001, A2BS1243S002, A2BS1244S001. Samples were re-extracted/re-analyzed due to low 3:3 FTCA recovery. Similar results were obtained for re-analysis.

Surrogates: These surrogates were out of control: 13C4 PFBA (LCS 320-633847/2-A), 13C-6:2 FTCA (A2BS1243D001), 13C-6:2 FTCA (A2BS1243S001), 13C-6:2 FTCA (A2BS1243S002), 13C-6:2 FTCA (A2BS1244S001), 13C-8:2 FTCA (A2BS1243D001RE), 13C-8:2 FTCA (A2BS1243S001RE), 13C-8:2 FTCA (A2BS1243S002RE), 13C-8:2 FTCA (A2BS1244S001RE).

Tuning and Mass Calibration: No DV

Internal Standard Area/Retention Time: No DV

Initial Calibration: No DV

Continuing Calibration: No DV

Matrix Spike: No MS's for this SDG. No SD's for this SDG.

Holding Time: These NativeIDs exceeded holding time: A2BS1243D001, A2BS1243S001, A2BS1243S002, A2BS1244S001.

COC: No discrepancies were noted

VDMS4.59

Data Package Completeness Package was complete for level V validation

Forms Review/ Items of Interest

These NativeIDs had dilutions or re-extractions that were flagged Exclude: A2BS1243D001, A2BS1243S001, A2BS1243S002, A2BS1244S001. Samples were re-extracted/re-analyzed due to low 3:3 FTCA recovery. Similar results were obtained for re-analysis.

COC Review

No discrepancies were noted

Final Data Flags*

*When the data evaluation process results in multiple flags, the most severe flag becomes the final data flag. All flags are from the site-specific QAPP, except the "exclude" flag that is used to designate results that are not for risk assessment (for example, a result from a dilution where the original undiluted result is appropriate).

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: A2BS1243D001								
102FTSA	0.037	U	U	0.037	0.2		ug/Kg	
11CLPF3OUDSA	0.03	U	U	0.03	0.2		ug/Kg	
3:3 FTCA	0.04	UJ	U *-	0.04	0.2		ug/Kg	InvalidLabFlag (U)
	0.04	UJ	U *-	0.04	0.2		ug/Kg	LCS<LCL (UJ)
42FTSA	0.05	U	U	0.05	0.2		ug/Kg	
5:3 FTCA	0.037	U	U	0.037	0.2		ug/Kg	
62FTSA	0.027	UJ	U	0.027	0.29		ug/Kg	Sur<LCL (UJ)
7:3 FTCA	0.04	UJ	U	0.04	0.2		ug/Kg	HTa>UCL (UJ)
82FTSA	0.034	U	U	0.034	0.2		ug/Kg	
9CLPF3ONSA	0.034	U	U	0.034	0.2		ug/Kg	
ADONA	0.038	U	U	0.038	0.2		ug/Kg	
HFPODA	0.04	U	U	0.04	0.2		ug/Kg	
NETFOSA	0.046	U	U *+	0.046	0.2		ug/Kg	InvalidLabFlag (U)
	0.046	U	U *+	0.046	0.2		ug/Kg	LCS>UCL (none)
NETFOSAA	0.047	U	U	0.047	0.2		ug/Kg	
NETFOSE	0.028	U	U	0.028	0.2		ug/Kg	
NFDHA	0.039	U	U	0.039	0.2		ug/Kg	
NMEFOSA	0.048	U	U *+	0.048	0.2		ug/Kg	InvalidLabFlag (U)
NMEFOSAA	0.023	U	U	0.023	0.2		ug/Kg	
NMEFOSE	0.046	U	U	0.046	0.2		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.037	U	U	0.037	0.2		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.25	J	J	0.045	0.29		ug/Kg	
Perfluorodecanesulfonic acid (PFDS)	0.051	U	U	0.051	0.2		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.047	U	U	0.047	0.2		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.029	U	U	0.029	0.2		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.048	U	U	0.048	0.2		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.039	J	J	0.037	0.2		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.028	U	U	0.028	0.2		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.07	J	J	0.03	0.2		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.037	U	U	0.037	0.2		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.065	U	U *+	0.065	0.2		ug/Kg	InvalidLabFlag (U)
Perfluorononanesulfonic acid (PFNS)	0.028	U	U	0.028	0.2		ug/Kg	
Perfluorononanoic acid (PFNA)	0.022	U	U	0.022	0.2		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.032	U	U	0.032	0.2		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.15	J	J	0.042	0.29		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.1	J	J	0.052	0.29		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.036	U	U	0.036	0.2		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.041	J	J	0.04	0.2		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.036	U	U	0.036	0.2		ug/Kg	
Perfluorotridecanoic acid (PFTriDA)	0.021	U	U	0.021	0.2		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.041	U	U	0.041	0.2		ug/Kg	
PFEESA	0.031	U	U	0.031	0.2		ug/Kg	
PFMBA	0.044	U	U	0.044	0.2		ug/Kg	
PFMPA	0.024	U	U	0.024	0.2		ug/Kg	
Field ID: A2BS1243S001								
102FTSA	0.038	U	U	0.038	0.2		ug/Kg	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: A2BS1243S001								
11CLPF3OUDSA	0.031	U	U	0.031	0.2		ug/Kg	
3:3 FTCA	0.041	UJ	U *-	0.041	0.2		ug/Kg	InvalidLabFlag (U)
	0.041	UJ	U *-	0.041	0.2		ug/Kg	LCS<LCL (UJ)
42FTSA	0.051	U	U	0.051	0.2		ug/Kg	
5:3 FTCA	0.038	U	U	0.038	0.2		ug/Kg	
62FTSA	0.027	UJ	U	0.027	0.3		ug/Kg	Sur<LCL (UJ)
7:3 FTCA	0.041	UJ	U	0.041	0.2		ug/Kg	HTa>UCL (UJ)
82FTSA	0.035	U	U	0.035	0.2		ug/Kg	
9CLPF3ONSA	0.035	U	U	0.035	0.2		ug/Kg	
ADONA	0.039	U	U	0.039	0.2		ug/Kg	
HFPODA	0.041	U	U	0.041	0.2		ug/Kg	
NETFOSA	0.047	U	U *+	0.047	0.2		ug/Kg	InvalidLabFlag (U)
	0.047	U	U *+	0.047	0.2		ug/Kg	LCS>UCL (none)
NETFOSAA	0.048	U	U	0.048	0.2		ug/Kg	
NETFOSE	0.029	J	J	0.028	0.2		ug/Kg	
NFDHA	0.04	U	U	0.04	0.2		ug/Kg	
NMEFOSA	0.049	U	U *+	0.049	0.2		ug/Kg	InvalidLabFlag (U)
NMEFOSAA	0.023	U	U	0.023	0.2		ug/Kg	
NMEFOSE	0.047	U	U	0.047	0.2		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.038	U	U	0.038	0.2		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.27	J	J	0.046	0.3		ug/Kg	
Perfluorodecanesulfonic acid (PFDS)	0.052	U	U	0.052	0.2		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.048	U	U	0.048	0.2		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.03	U	U	0.03	0.2		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.049	U	U	0.049	0.2		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.038	U	U	0.038	0.2		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.029	U	U	0.029	0.2		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.073	J	J	0.031	0.2		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.038	U	U	0.038	0.2		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.066	U	U *+	0.066	0.2		ug/Kg	InvalidLabFlag (U)
Perfluorononanesulfonic acid (PFNS)	0.029	U	U	0.029	0.2		ug/Kg	
Perfluorononanoic acid (PFNA)	0.026	J	J	0.022	0.2		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.033	U	U	0.033	0.2		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.2	J	J	0.043	0.3		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.11	J	J	0.053	0.3		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.037	U	U	0.037	0.2		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.041	U	U	0.041	0.2		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.037	U	U	0.037	0.2		ug/Kg	
Perfluorotridecanoic acid (PFTrDA)	0.021	U	U	0.021	0.2		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.042	U	U	0.042	0.2		ug/Kg	
PFEESA	0.032	U	U	0.032	0.2		ug/Kg	
PFMBA	0.045	U	U	0.045	0.2		ug/Kg	
PFMPA	0.024	U	U	0.024	0.2		ug/Kg	
Field ID: A2BS1243S002								
102FTSA	0.036	U	U	0.036	0.19		ug/Kg	
11CLPF3OUDSA	0.03	U	U	0.03	0.19		ug/Kg	
3:3 FTCA	0.039	UJ	U *-	0.039	0.19		ug/Kg	InvalidLabFlag (U)
	0.039	UJ	U *-	0.039	0.19		ug/Kg	LCS<LCL (UJ)
42FTSA	0.049	U	U	0.049	0.19		ug/Kg	
5:3 FTCA	0.036	U	U	0.036	0.19		ug/Kg	
62FTSA	0.026	UJ	U	0.026	0.29		ug/Kg	Sur<LCL (UJ)
7:3 FTCA	0.039	UJ	U	0.039	0.19		ug/Kg	HTa>UCL (UJ)

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: A2BS1243S002								
82FTSA	0.033	U	U	0.033	0.19		ug/Kg	
9CLPF3ONSA	0.033	U	U	0.033	0.19		ug/Kg	
ADONA	0.037	U	U	0.037	0.19		ug/Kg	
HFPODA	0.039	U	U	0.039	0.19		ug/Kg	
NETFOSA	0.045	U	U *+	0.045	0.19		ug/Kg	InvalidLabFlag (U)
	0.045	U	U *+	0.045	0.19		ug/Kg	LCS>UCL (none)
NETFOSAA	0.046	U	U	0.046	0.19		ug/Kg	
NETFOSE	0.027	U	U	0.027	0.19		ug/Kg	
NFDHA	0.038	U	U	0.038	0.19		ug/Kg	
NMEFOSA	0.047	U	U *+	0.047	0.19		ug/Kg	InvalidLabFlag (U)
NMEFOSAA	0.022	U	U	0.022	0.19		ug/Kg	
NMEFOSE	0.045	U	U	0.045	0.19		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.24	J	J	0.044	0.29		ug/Kg	
Perfluorodecanesulfonic acid (PFDS)	0.05	U	U	0.05	0.19		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.046	U	U	0.046	0.19		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.029	U	U	0.029	0.19		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.047	U	U	0.047	0.19		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.03	U	U	0.03	0.19		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.063	U	U *+	0.063	0.19		ug/Kg	InvalidLabFlag (U)
Perfluorononanesulfonic acid (PFNS)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluorononanoic acid (PFNA)	0.021	U	U	0.021	0.19		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.031	U	U	0.031	0.19		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.072	J	J	0.041	0.29		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.051	U	U	0.051	0.29		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.035	U	U	0.035	0.19		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.039	U	U	0.039	0.19		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.035	U	U	0.035	0.19		ug/Kg	
Perfluorotridecanoic acid (PFTrDA)	0.02	U	U	0.02	0.19		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.04	U	U	0.04	0.19		ug/Kg	
PFEESA	0.031	U	U	0.031	0.19		ug/Kg	
PFMBA	0.043	U	U	0.043	0.19		ug/Kg	
PFMPA	0.023	U	U	0.023	0.19		ug/Kg	
Field ID: A2BS1244S001								
102FTSA	0.036	U	U	0.036	0.19		ug/Kg	
11CLPF3OUDSA	0.029	U	U	0.029	0.19		ug/Kg	
3:3 FTCA	0.038	UJ	U *-	0.038	0.19		ug/Kg	InvalidLabFlag (U)
	0.038	UJ	U *-	0.038	0.19		ug/Kg	LCS<LCL (UJ)
42FTSA	0.048	U	U	0.048	0.19		ug/Kg	
5:3 FTCA	0.036	U	U	0.036	0.19		ug/Kg	
62FTSA	0.025	UJ	U	0.025	0.28		ug/Kg	Sur<LCL (UJ)
7:3 FTCA	0.038	UJ	U	0.038	0.19		ug/Kg	HTa>UCL (UJ)
82FTSA	0.033	U	U	0.033	0.19		ug/Kg	
9CLPF3ONSA	0.033	U	U	0.033	0.19		ug/Kg	
ADONA	0.036	U	U	0.036	0.19		ug/Kg	
HFPODA	0.038	U	U	0.038	0.19		ug/Kg	
NETFOSA	0.044	U	U *+	0.044	0.19		ug/Kg	InvalidLabFlag (U)
	0.044	U	U *+	0.044	0.19		ug/Kg	LCS>UCL (none)
NETFOSAA	0.097	J	J	0.045	0.19		ug/Kg	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: A2BS1244S001								
NETFOSE	0.035	J	J	0.026	0.19		ug/Kg	
NFDHA	0.037	U	U	0.037	0.19		ug/Kg	
NMEFOSA	0.046	U	U *+	0.046	0.19		ug/Kg	InvalidLabFlag (U)
NMEFOSAA	0.021	U	U	0.021	0.19		ug/Kg	
NMEFOSE	0.044	U	U	0.044	0.19		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.14	J	J	0.043	0.28		ug/Kg	
Perfluorodecanesulfonic acid (PFDS)	0.049	U	U	0.049	0.19		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.056	J	J	0.045	0.19		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.044	J	J	0.028	0.19		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.046	U	U	0.046	0.19		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.027	U	U	0.027	0.19		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.029	U	U	0.029	0.19		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.062	U	U *+	0.062	0.19		ug/Kg	InvalidLabFlag (U)
Perfluoronanesulfonic acid (PFNS)	0.027	U	U	0.027	0.19		ug/Kg	
Perfluoronanoic acid (PFNA)	0.028	J	J	0.021	0.19		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.031	U	U	0.031	0.19		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.62			0.04	0.28		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.073	J	J	0.05	0.28		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.035	U	U	0.035	0.19		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.038	U	U	0.038	0.19		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.035	U	U	0.035	0.19		ug/Kg	
Perfluorotridecanoic acid (PFTrDA)	0.02	U	U	0.02	0.19		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.039	U	U	0.039	0.19		ug/Kg	
PFEESA	0.03	U	U	0.03	0.19		ug/Kg	
PFMBA	0.042	U	U	0.042	0.19		ug/Kg	
PFMPA	0.022	U	U	0.022	0.19		ug/Kg	

Validation Flag Abbreviations

<i>Abbreviation</i>	<i>Validation Reason</i>	<i>Category</i>
HTa>UCL	Holding time exceeded	HoldingTime
LCS<LCL	LCS recovery less than the lower control limit	LaboratoryControlSample
LCS>UCL	LCS recovery greater than the upper control limit	LaboratoryControlSample
InvalidLabFlag	Removed invalid laboratory flag	Miscellaneous
Sur<LCL	Surrogate recovery less than the lower control limit	SurrogateRecovery

NASA SSFL CJ063 PFAS PO 148024177

Data Quality Evaluation

SDG: 570-117078-1

Validator/Date:

mfesler

1/9/2023

Method: E537M

Reviewer/Date:

mfesler

1/10/2023

Matrix: Soil/Water

Field Samples

Field blank association lot values: LotNumber / FieldID / SDG

NativeID	QAQC Type	Dilution	EB Lot	TB Lot	AB Lot
SOIL					
AABS1265S001	N	1	07112201 / EBQW2809Q001 / 570-116845-1		
EVBS2004S002	N	1	07112201 / EBQW2809Q001 / 570-116845-1		
EVBS2004S002MS	MS	1			
EVBS2004S002SD	SD	1			
APBS1245S001	N	1	07112201 / EBQW2809Q001 / 570-116845-1		
APBS1245S002	N	1	07112201 / EBQW2809Q001 / 570-116845-1		
APBS1246S001	N	1	07112201 / EBQW2809Q001 / 570-116845-1		
APBS1246S002	N	1	07112201 / EBQW2809Q001 / 570-116845-1		
EVBS2003S001	N	1	07112201 / EBQW2809Q001 / 570-116845-1		
EVBS2004S001	N	1	07112201 / EBQW2809Q001 / 570-116845-1		
WATER					
EBQW2815Q001	EB	1			
EBQW2816Q001	EB	1			

Associated Field Blanks (other SDGs)

NativeID	QAQC Type	Dilution	EB Lot	TB Lot	AB Lot
WATER					
EBQW2809Q001	EB	1	07112201 / EBQW2809Q001 / 570-116845-1		
EBQW2813Q001	EB	1	07112201 / EBQW2809Q001 / 570-116845-1		

1. Case Narrative / Items of Interest

The following items were noted: EMPC; LB<RL; LCS<LCL; SD<LCL; Sur<LCL

2. Blank Summary

Field Blanks

No Field Blank detects were found.

Method Blanks

These analytes had Method Blank detects: Perfluorobutanoic acid (PFBA).

<u>Blank Type</u>	<u>Blank ID</u>	<u>Analyte</u>	<u>Result</u>	<u>Report Limit</u>	<u>Lab Flag</u>	<u>Units</u>	<u>SDG</u>
LB	MB 320-633851/1-A	Perfluorobutanoic acid (PFBA)	0.1902	0.3	J	ug/Kg	570-117078-1

3. Spikes and Duplicates

Field Duplicate

No FD Associated.

Laboratory Duplicates

None in this SDG

Matrix Spike

These MS's were out of control: 5:3 FTCA (MS - EVBS2004S002MS), 7:3 FTCA (MS - EVBS2004S002MS), NETFOSA (MS - EVBS2004S002MS), Perfluoro-n-octadecanoic acid (PFODA) (MS - EVBS2004S002MS). These SD's were out of control: 3:3 FTCA (SD - EVBS2004S002SD), 5:3 FTCA (SD - EVBS2004S002SD), 7:3 FTCA (SD - EVBS2004S002SD), Perfluoro-n-octadecanoic acid (PFODA) (SD - EVBS2004S002SD). All RPD acceptance criteria were met. For high recoveries and associated sample results ND, no flagging applied. For sample EVBS2004S001, the ion ratio criteria were not met for 5:3 FTCA. Associated sample result qualified as ND.

<i>Matrix / Analyte</i>	<i>Sample ID</i>	<i>LR Type</i>	<i>Result</i>	<i>Qualifier</i>	<i>Reason</i>
SOIL	<u>3:3 FTCA</u>				
	EVBS2004S002		0.041 ug/Kg	UJ	SD<LCL
SOIL	<u>5:3 FTCA</u>				
	EVBS2004S001		0.12 ug/Kg	U	EMPC
	EVBS2004S002		0.038 ug/Kg	none	MS>UCL
	EVBS2004S002		0.038 ug/Kg	none	SD>UCL
SOIL	<u>7:3 FTCA</u>				
	EVBS2004S002		0.041 ug/Kg	none	MS>UCL
	EVBS2004S002		0.041 ug/Kg	none	SD>UCL
SOIL	<u>NETFOSA</u>				
	EVBS2004S002		0.047 ug/Kg	none	MS>UCL
SOIL	<u>Perfluoro-n-octadecanoic acid (PFODA)</u>				
	EVBS2004S002		0.065 ug/Kg	none	MS>UCL
	EVBS2004S002		0.065 ug/Kg	none	SD>UCL

4. Laboratory Control Sample

These LCS analytes were out of control: 11CLPF3OUDSA (BS), 3:3 FTCA (BS), ADONA (BD), ADONA (BS), NETFOSA (BD), Perfluoro-n-octadecanoic acid (PFODA) (BD), Perfluorononanesulfonic acid (PFNS) (BS). These LCS RPD analytes were out of control: Perfluoro-n-octadecanoic acid (PFODA) (BS). Since sample results were ND, no flagging for RPD exceedance

<u>Matrix</u>	<u>QAQC Type</u>	<u>Field ID</u>	<u>Analyte</u>	<u>Recovery</u>	<u>Lower Limit</u>	<u>Upper Limit</u>
WATER	BS	LCS 320-633039/2-A	11CLPF3OUDSA	137	80	131
WATER	BS	LCS 320-633039/2-A	ADONA	138	87	135
WATER	BS	LCS 320-633039/2-A	Perfluorononanesulfonic acid (PFNS)	131	69	127
SOIL	BS	LCS 320-633851/2-A	3:3 FTCA	66	70	130
WATER	BD	LCSD 320-633039/3-A	ADONA	137	87	135
WATER	BD	LCSD 320-633039/3-A	NETFOSA	111	83	110
WATER	BD	LCSD 320-633039/3-A	Perfluoro-n-octadecanoic acid (PFODA)	41	72	134

5. Surrogates

These surrogates were out of control: 13C2 10:2 FTS (EBQW2815Q001), 13C2 8:2 FTS (EBQW2815Q001), 13C4 PFBA (APBS1245S001), 13C4 PFBA (APBS1246S001), 13C4 PFBA (EVBS2003S001), 13C4 PFBA (EVBS2004S001), 13C4 PFBA (EVBS2004S002), 13C4 PFBA (LCS 320-639739/2-A), 13C4 PFBA (MB 320-633851/1-A), 13C-6:2 FTCA (AABS1265S001), 13C-6:2 FTCA (APBS1245S001), 13C-6:2 FTCA (APBS1245S002), 13C-6:2 FTCA (APBS1246S001), 13C-6:2 FTCA (APBS1246S002), 13C-6:2 FTCA (EVBS2003S001), 13C-6:2 FTCA (EVBS2004S001), 13C-6:2 FTCA (EVBS2004S002), 13C-6:2 FTCA (EVBS2004S002MS), 13C-6:2 FTCA (EVBS2004S002SD), 13C-8:2 FTCA (AABS1265S001), 13C-8:2 FTCA (APBS1245S001), 13C-8:2 FTCA (APBS1245S002), 13C-8:2 FTCA (APBS1246S001), 13C-8:2 FTCA (APBS1246S002), 13C-8:2 FTCA (EVBS2003S001), 13C-8:2 FTCA (EVBS2004S001), 13C-8:2 FTCA (EVBS2004S002), 13C-8:2 FTCA

(EVBS2004S002MS), 13C-8:2 FTCA (EVBS2004S002SD), d3-NMeFOSAA (APBS1245S002), d3-NMeFOSAA (APBS1246S002).

<u>Field ID</u>	<u>LabsampleID</u>	<u>LowerLimit</u>	<u>UpperLimit</u>	<u>Result</u>	<u>Surrogate</u>
AABS1265S001	570-117078-1	50	150	11	13C-6:2 FTCA
AABS1265S001	570-117078-1	50	150	12	13C-8:2 FTCA
APBS1245S001	570-117078-2	50	150	46	13C4 PFBA
APBS1245S001	570-117078-2	50	150	49	13C4 PFBA
APBS1245S001	570-117078-2	50	150	17	13C-6:2 FTCA
APBS1245S001	570-117078-2	50	150	19	13C-8:2 FTCA
APBS1245S002	570-117078-3	50	150	7	13C-6:2 FTCA
APBS1245S002	570-117078-3	50	150	9	13C-8:2 FTCA
APBS1245S002	570-117078-3	50	150	48	d3-NMeFOSAA
APBS1246S001	570-117078-4	50	150	43	13C4 PFBA
APBS1246S001	570-117078-4	50	150	19	13C-6:2 FTCA
APBS1246S001	570-117078-4	50	150	22	13C-8:2 FTCA
APBS1246S002	570-117078-5	50	150	7	13C-6:2 FTCA
APBS1246S002	570-117078-5	50	150	10	13C-8:2 FTCA
APBS1246S002	570-117078-5	50	150	47	d3-NMeFOSAA
EBQW2815Q001	570-117078-6	50	150	178	13C2 10:2 FTS
EBQW2815Q001	570-117078-6	50	150	177	13C2 8:2 FTS
EVBS2003S001	570-117078-8	50	150	47	13C4 PFBA
EVBS2003S001	570-117078-8	50	150	8	13C-6:2 FTCA
EVBS2003S001	570-117078-8	50	150	10	13C-8:2 FTCA
EVBS2004S001	570-117078-9	50	150	49	13C4 PFBA
EVBS2004S001	570-117078-9	50	150	46	13C4 PFBA
EVBS2004S001	570-117078-9	50	150	14	13C-6:2 FTCA
EVBS2004S001	570-117078-9	50	150	14	13C-8:2 FTCA
EVBS2004S002	570-117078-10	50	150	49	13C4 PFBA
EVBS2004S002	570-117078-10	50	150	7	13C-6:2 FTCA
EVBS2004S002	570-117078-10	50	150	7	13C-8:2 FTCA
EVBS2004S002MS	570-117078-10	50	150	6	13C-6:2 FTCA
EVBS2004S002MS	570-117078-10	50	150	8	13C-8:2 FTCA
EVBS2004S002SD	570-117078-10	50	150	8	13C-6:2 FTCA
EVBS2004S002SD	570-117078-10	50	150	7	13C-8:2 FTCA
LCS 320-639739/2-A	LCS 320-639739/	50	150	43	13C4 PFBA
MB 320-633851/1-A	MB 320-633851/1-	50	150	46	13C4 PFBA

6. Tuning and Mass Calibration

Tuning and Mass Calibration were not examined by AutoDV.

7. Internal Standard

Internal Standard Area/Retention Time was not examined by AutoDV.

8. Calibration Information

Initial Calibration

Initial Calibration was not examined by AutoDV.

Continuing Calibration

Continuing Calibration was not examined by AutoDV.

9. Holding Time

These NativeIDs exceeded holding time: AABS1265S001, APBS1245S001, APBS1245S002, APBS1246S001, APBS1246S002,

EVBS2003S001, EVBS2004S001, EVBS2004S002. For re-extracted data only; will report data from original analysis - no flagging for HT

Field ID	LabsampleID	AnalysisDate	ExtractDate	Sample Date	Method Time	Actual	HT
AABS1265S001	570-117078-1	12/14/2022	12/13/2022	11/10/2022	14		33
APBS1245S001	570-117078-2	12/14/2022	12/13/2022	11/10/2022	14		33
APBS1245S002	570-117078-3	12/14/2022	12/13/2022	11/10/2022	14		33
APBS1246S001	570-117078-4	12/14/2022	12/13/2022	11/10/2022	14		33
APBS1246S002	570-117078-5	12/14/2022	12/13/2022	11/10/2022	14		33
EVBS2003S001	570-117078-8	12/14/2022	12/13/2022	11/10/2022	14		33
EVBS2004S001	570-117078-9	12/14/2022	12/13/2022	11/10/2022	14		33
EVBS2004S002	570-117078-10	12/14/2022	12/13/2022	11/10/2022	14		33

10. Confirmation

None for this SDG.

11. Summary

General Comments

Field Duplicates: No FD Associated.

Form I Review: These NativeIDs had dilutions or re-extractions that were flagged Exclude: AABS1265S001, APBS1245S001, APBS1245S002, APBS1246S001, APBS1246S002, EBQW2815Q001, EBQW2816Q001, EVBS2003S001, EVBS2004S001, EVBS2004S002, EVBS2004S002MS, EVBS2004S002SD.

Method Blanks: These analytes had Method Blank detects: Perfluorobutanoic acid (PFBA).

Surrogates: These surrogates were out of control: 13C2 10:2 FTS (EBQW2815Q001), 13C2 8:2 FTS (EBQW2815Q001), 13C4 PFBA (APBS1245S001), 13C4 PFBA (APBS1246S001), 13C4 PFBA (EVBS2003S001), 13C4 PFBA (EVBS2004S001), 13C4 PFBA (EVBS2004S002), 13C4 PFBA (LCS 320-639739/2-A), 13C4 PFBA (MB 320-633851/1-A), 13C-6:2 FTCA (AABS1265S001), 13C-6:2 FTCA (APBS1245S001), 13C-6:2 FTCA (APBS1245S002), 13C-6:2 FTCA (APBS1246S001), 13C-6:2 FTCA (APBS1246S002), 13C-6:2 FTCA (EVBS2003S001), 13C-6:2 FTCA (EVBS2004S001), 13C-6:2 FTCA (EVBS2004S002), 13C-6:2 FTCA (EVBS2004S002MS), 13C-6:2 FTCA (EVBS2004S002SD), 13C-8:2 FTCA (AABS1265S001), 13C-8:2 FTCA (APBS1245S001), 13C-8:2 FTCA (APBS1245S002), 13C-8:2 FTCA (APBS1246S001), 13C-8:2 FTCA (APBS1246S002), 13C-8:2 FTCA (EVBS2003S001), 13C-8:2 FTCA (EVBS2004S001), 13C-8:2 FTCA (EVBS2004S002), 13C-8:2 FTCA (EVBS2004S002MS), 13C-8:2 FTCA (EVBS2004S002SD), d3-NMeFOSAA (APBS1245S002), d3-NMeFOSAA (APBS1246S002).

Tuning and Mass Calibration: Tuning and Mass Calibration were not examined by AutoDV.

Internal Standard Area/Retention Time: Internal Standard Area/Retention Time was not examined by AutoDV.

Initial Calibration: Initial Calibration was not examined by AutoDV.

Continuing Calibration: Continuing Calibration was not examined by AutoDV.

Laboratory Control Sample: These LCS analytes were out of control: 11CLPF3OUDSA (BS), 3:3 FTCA (BS), ADONA (BD), ADONA (BS), NETFOSA (BD), Perfluoro-n-octadecanoic acid (PFODA) (BD), Perfluorononanesulfonic acid (PFNS) (BS). These LCS RPD analytes were out of control: Perfluoro-n-octadecanoic acid (PFODA) (BS).

Holding Time: These NativeIDs exceeded holding time: AABS1265S001, APBS1245S001, APBS1245S002, APBS1246S001, APBS1246S002, EVBS2003S001, EVBS2004S001, EVBS2004S002.

VDMS4.59

Data Package Completeness Package was complete for level V validation

Forms Review/ Items of Interest

These NativeIDs had dilutions or re-extractions that were flagged Exclude: AABS1265S001, APBS1245S001, APBS1245S002, APBS1246S001, APBS1246S002, EBQW2815Q001, EBQW2816Q001, EVBS2003S001, EVBS2004S001, EVBS2004S002, EVBS2004S002MS, EVBS2004S002SD. Samples were re-extracted/re-analyzed due to QC issues. For PFODA and PFBA, data reported from original analyses were reported.

COC Review

No discrepancies were noted

Final Data Flags*

*When the data evaluation process results in multiple flags, the most severe flag becomes the final data flag. All flags are from the site-specific QAPP, except the "exclude" flag that is used to designate results that are not for risk assessment (for example, a result from a dilution where the original undiluted result is appropriate).

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: AABS1265S001								
102FTSA	0.038	U	U	0.038	0.2		ug/Kg	
11CLPF3OUDSA	0.031	U	U	0.031	0.2		ug/Kg	
3:3 FTCA	0.041	UJ	U *-	0.041	0.2		ug/Kg	LCS<LCL (UJ)
42FTSA	0.051	U	U	0.051	0.2		ug/Kg	
5:3 FTCA	0.038	U	U	0.038	0.2		ug/Kg	
62FTSA	0.027	UJ	U	0.027	0.3		ug/Kg	Sur<LCL (UJ)
7:3 FTCA	0.041	UJ	U	0.041	0.2		ug/Kg	Sur<LCL (UJ)
82FTSA	0.035	U	U	0.035	0.2		ug/Kg	
9CLPF3ONSA	0.035	U	U	0.035	0.2		ug/Kg	
ADONA	0.039	U	U	0.039	0.2		ug/Kg	
HFPODA	0.041	U	U	0.041	0.2		ug/Kg	
NETFOSA	0.047	U	U	0.047	0.2		ug/Kg	
NETFOSAA	0.048	U	U	0.048	0.2		ug/Kg	
NETFOSE	0.028	U	U	0.028	0.2		ug/Kg	
NFDHA	0.04	U	U	0.04	0.2		ug/Kg	
NMEFOSA	0.049	U	U	0.049	0.2		ug/Kg	
NMEFOSAA	0.023	U	U	0.023	0.2		ug/Kg	
NMEFOSE	0.047	U	U	0.047	0.2		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.038	U	U	0.038	0.2		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.16	U	J B	0.046	0.3		ug/Kg	LB<RL (U)
	0.044	Exclude	U H	0.044	0.28		ug/Kg	RE (Exclude)
	0.044	Exclude	U H	0.044	0.28		ug/Kg	HTp>UCL (R)
Perfluorodecanesulfonic acid (PFDS)	0.052	U	U	0.052	0.2		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.048	U	U	0.048	0.2		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.03	U	U	0.03	0.2		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.049	U	U	0.049	0.2		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.038	U	U	0.038	0.2		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.029	U	U	0.029	0.2		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.031	U	U	0.031	0.2		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.038	U	U	0.038	0.2		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.065	U	U	0.065	0.2		ug/Kg	
Perfluorononanesulfonic acid (PFNS)	0.029	U	U	0.029	0.2		ug/Kg	
Perfluorononanoic acid (PFNA)	0.022	U	U	0.022	0.2		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.033	U	U	0.033	0.2		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.086	J	J	0.043	0.3		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.06	J	J	0.053	0.3		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.037	U	U	0.037	0.2		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.041	U	U	0.041	0.2		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.037	U	U	0.037	0.2		ug/Kg	
Perfluorotridecanoic acid (PFTrDA)	0.021	U	U	0.021	0.2		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.042	U	U	0.042	0.2		ug/Kg	
PFEESA	0.032	U	U	0.032	0.2		ug/Kg	
PFMBA	0.045	U	U	0.045	0.2		ug/Kg	
PFMPA	0.024	U	U	0.024	0.2		ug/Kg	
Field ID: EVBS2004S002								
102FTSA	0.038	U	U	0.038	0.2		ug/Kg	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: EVBS2004S002								
11CLPF3OUDSA	0.031	U	U	0.031	0.2		ug/Kg	
3:3 FTCA	0.041	UJ	U *- F1	0.041	0.2		ug/Kg	LCS<LCL (UJ)
	0.041	UJ	U *- F1	0.041	0.2		ug/Kg	SD<LCL (UJ)
42FTSA	0.051	U	U	0.051	0.2		ug/Kg	
5:3 FTCA	0.038	U	UF1	0.038	0.2		ug/Kg	MS>UCL (none)
	0.038	U	UF1	0.038	0.2		ug/Kg	SD>UCL (none)
	0.038	U	UF1	0.038	0.2		ug/Kg	InvalidLabFlag (U)
62FTSA	0.027	R	U	0.027	0.3		ug/Kg	Sur<LCL (R)
7:3 FTCA	0.041	R	UF1	0.041	0.2		ug/Kg	Sur<LCL (R)
	0.041	R	UF1	0.041	0.2		ug/Kg	MS>UCL (none)
	0.041	R	UF1	0.041	0.2		ug/Kg	SD>UCL (none)
82FTSA	0.035	U	U	0.035	0.2		ug/Kg	
9CLPF3ONSA	0.035	U	U	0.035	0.2		ug/Kg	
ADONA	0.039	U	U	0.039	0.2		ug/Kg	
HFPODA	0.041	U	U	0.041	0.2		ug/Kg	
NETFOSA	0.047	U	U	0.047	0.2		ug/Kg	MS>UCL (none)
NETFOSAA	0.048	U	U	0.048	0.2		ug/Kg	
NETFOSE	0.028	U	U	0.028	0.2		ug/Kg	
NFDHA	0.04	U	U	0.04	0.2		ug/Kg	
NMEFOSA	0.049	U	UF1	0.049	0.2		ug/Kg	InvalidLabFlag (U)
NMEFOSAA	0.023	U	U	0.023	0.2		ug/Kg	
NMEFOSE	0.047	U	U	0.047	0.2		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.038	U	U	0.038	0.2		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.044	Exclude	U H	0.044	0.29		ug/Kg	RE (Exclude)
	0.044	Exclude	U H	0.044	0.29		ug/Kg	HTp>UCL (R)
	0.17	U	J B	0.046	0.3		ug/Kg	LB<RL (U)
Perfluorodecanesulfonic acid (PFDS)	0.052	U	U	0.052	0.2		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.048	U	U	0.048	0.2		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.03	U	U	0.03	0.2		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.049	U	U	0.049	0.2		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.088	J	J	0.038	0.2		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.032	J	J	0.029	0.2		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.045	J	J	0.031	0.2		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.038	U	U	0.038	0.2		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.065	U	UF1	0.065	0.2		ug/Kg	SD>UCL (none)
	0.065	U	UF1	0.065	0.2		ug/Kg	InvalidLabFlag (U)
	0.065	U	UF1	0.065	0.2		ug/Kg	MS>UCL (none)
Perfluorononanesulfonic acid (PFNS)	0.029	U	U	0.029	0.2		ug/Kg	
Perfluorononanoic acid (PFNA)	0.035	J	J	0.022	0.2		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.033	U	U	0.033	0.2		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.32			0.043	0.3		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.33			0.053	0.3		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.037	U	U	0.037	0.2		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.046	J	J	0.041	0.2		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.037	U	U	0.037	0.2		ug/Kg	
Perfluorotridecanoic acid (PFTrDA)	0.021	U	U	0.021	0.2		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.042	U	U	0.042	0.2		ug/Kg	
PFEESA	0.032	U	U	0.032	0.2		ug/Kg	
PFMBA	0.045	U	U	0.045	0.2		ug/Kg	
PFMPA	0.024	U	U	0.024	0.2		ug/Kg	
Field ID: APBS1245S001								
102FTSA	0.035	U	U	0.035	0.18		ug/Kg	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: APBS1245S001								
11CLPF3OUDSA	0.028	U	U	0.028	0.18		ug/Kg	
3:3 FTCA	0.038	UJ	U *-	0.038	0.18		ug/Kg	LCS<LCL (UJ)
42FTSA	0.047	U	U	0.047	0.18		ug/Kg	
5:3 FTCA	0.035	U	U	0.035	0.18		ug/Kg	
62FTSA	0.025	UJ	U	0.025	0.27		ug/Kg	Sur<LCL (UJ)
7:3 FTCA	0.038	UJ	U	0.038	0.18		ug/Kg	Sur<LCL (UJ)
82FTSA	0.032	U	U	0.032	0.18		ug/Kg	
9CLPF3ONSA	0.032	U	U	0.032	0.18		ug/Kg	
ADONA	0.036	U	U	0.036	0.18		ug/Kg	
HFPODA	0.038	U	U	0.038	0.18		ug/Kg	
NETFOSA	0.043	U	U	0.043	0.18		ug/Kg	
NETFOSAA	0.044	U	U	0.044	0.18		ug/Kg	
NETFOSE	0.026	U	U	0.026	0.18		ug/Kg	
NFDHA	0.037	U	U	0.037	0.18		ug/Kg	
NMEFOSA	0.045	U	U	0.045	0.18		ug/Kg	
NMEFOSAA	0.021	U	U	0.021	0.18		ug/Kg	
NMEFOSE	0.043	U	U	0.043	0.18		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.035	U	U	0.035	0.18		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.06	Exclude	J H	0.044	0.29		ug/Kg	RE (Exclude)
	0.06	Exclude	J H	0.044	0.29		ug/Kg	HTp>UCL (J)
	0.19	U	J B	0.042	0.27		ug/Kg	Sur<LCL (J)
	0.19	U	J B	0.042	0.27		ug/Kg	LB<RL (U)
Perfluorodecanesulfonic acid (PFDS)	0.048	U	U	0.048	0.18		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.044	U	U	0.044	0.18		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.027	U	U	0.027	0.18		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.045	U	U	0.045	0.18		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.052	J	J	0.035	0.18		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.027	U	U	0.027	0.18		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.06	J	J	0.028	0.18		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.035	U	U	0.035	0.18		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.06	U	U	0.06	0.18		ug/Kg	
Perfluorononanesulfonic acid (PFNS)	0.027	U	U	0.027	0.18		ug/Kg	
Perfluorononanoic acid (PFNA)	0.02	U	U	0.02	0.18		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.03	U	U	0.03	0.18		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.17	J	J	0.039	0.27		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.4			0.049	0.27		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.034	U	U	0.034	0.18		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.16	J	J	0.038	0.18		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.034	U	U	0.034	0.18		ug/Kg	
Perfluorotridecanoic acid (PFTrDA)	0.019	U	U	0.019	0.18		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.038	U	U	0.038	0.18		ug/Kg	
PFEESA	0.029	U	U	0.029	0.18		ug/Kg	
PFMBA	0.041	UJ	U	0.041	0.18		ug/Kg	Sur<LCL (UJ)
PFMPA	0.022	U	U	0.022	0.18		ug/Kg	
Field ID: APBS1245S002								
102FTSA	0.035	U	U	0.035	0.18		ug/Kg	
11CLPF3OUDSA	0.028	U	U	0.028	0.18		ug/Kg	
3:3 FTCA	0.037	UJ	U *-	0.037	0.18		ug/Kg	LCS<LCL (UJ)
42FTSA	0.047	U	U	0.047	0.18		ug/Kg	
5:3 FTCA	0.035	U	U	0.035	0.18		ug/Kg	
62FTSA	0.15	J	J	0.025	0.27		ug/Kg	Sur<LCL (J)
7:3 FTCA	0.037	R	U	0.037	0.18		ug/Kg	Sur<LCL (R)

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: APBS1245S002								
82FTSA	0.032	U	U	0.032	0.18		ug/Kg	
9CLPF3ONSA	0.032	U	U	0.032	0.18		ug/Kg	
ADONA	0.036	U	U	0.036	0.18		ug/Kg	
HFPODA	0.037	U	U	0.037	0.18		ug/Kg	
NETFOSA	0.043	U	U	0.043	0.18		ug/Kg	
NETFOSAA	0.044	U	U	0.044	0.18		ug/Kg	
NETFOSE	0.026	U	U	0.026	0.18		ug/Kg	
NFDHA	0.036	U	U	0.036	0.18		ug/Kg	
NMEFOSA	0.045	U	U	0.045	0.18		ug/Kg	
NMEFOSAA	0.021	UJ	U	0.021	0.18		ug/Kg	Sur<LCL (UJ)
NMEFOSE	0.043	U	U	0.043	0.18		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.035	U	U	0.035	0.18		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.053	Exclude	J H	0.044	0.28		ug/Kg	RE (Exclude)
	0.053	Exclude	J H	0.044	0.28		ug/Kg	HTp>UCL (J)
	0.19	U	J B	0.042	0.27		ug/Kg	LB<RL (U)
Perfluorodecanesulfonic acid (PFDS)	0.047	U	U	0.047	0.18		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.044	U	U	0.044	0.18		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.027	U	U	0.027	0.18		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.045	U	U	0.045	0.18		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.043	J	J	0.035	0.18		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.026	U	U	0.026	0.18		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.061	J	J	0.028	0.18		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.035	U	U	0.035	0.18		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.06	U	U	0.06	0.18		ug/Kg	
Perfluorononanesulfonic acid (PFNS)	0.026	U	U	0.026	0.18		ug/Kg	
Perfluorononanoic acid (PFNA)	0.02	U	U	0.02	0.18		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.03	U	U	0.03	0.18		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.18	J	J	0.039	0.27		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.28			0.048	0.27		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.034	U	U	0.034	0.18		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.076	J	J	0.037	0.18		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.034	U	U	0.034	0.18		ug/Kg	
Perfluorotridecanoic acid (PFTTrDA)	0.019	U	U	0.019	0.18		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.038	U	U	0.038	0.18		ug/Kg	
PFEESA	0.029	U	U	0.029	0.18		ug/Kg	
PFMBA	0.041	U	U	0.041	0.18		ug/Kg	
PFMPA	0.022	U	U	0.022	0.18		ug/Kg	
Field ID: APBS1246S001								
102FTSA	0.036	U	U	0.036	0.19		ug/Kg	
11CLPF3OUDSA	0.029	U	U	0.029	0.19		ug/Kg	
3:3 FTCA	0.039	UJ	U *-	0.039	0.19		ug/Kg	LCS<LCL (UJ)
42FTSA	0.048	U	U	0.048	0.19		ug/Kg	
5:3 FTCA	0.036	U	U	0.036	0.19		ug/Kg	
62FTSA	0.026	UJ	U	0.026	0.28		ug/Kg	Sur<LCL (UJ)
7:3 FTCA	0.046	J	J	0.039	0.19		ug/Kg	Sur<LCL (J)
82FTSA	0.033	U	U	0.033	0.19		ug/Kg	
9CLPF3ONSA	0.033	U	U	0.033	0.19		ug/Kg	
ADONA	0.037	U	U	0.037	0.19		ug/Kg	
HFPODA	0.039	U	U	0.039	0.19		ug/Kg	
NETFOSA	0.045	U	U	0.045	0.19		ug/Kg	
NETFOSAA	0.046	U	U	0.046	0.19		ug/Kg	
NETFOSE	0.027	U	U	0.027	0.19		ug/Kg	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: APBS1246S001								
NFDHA	0.038	U	U	0.038	0.19		ug/Kg	
NMEFOSA	0.046	U	U	0.046	0.19		ug/Kg	
NMEFOSAA	0.023	J	J	0.022	0.19		ug/Kg	
NMEFOSE	0.045	U	U	0.045	0.19		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.18	U	JB	0.044	0.28		ug/Kg	LB<RL (U)
	0.18	U	JB	0.044	0.28		ug/Kg	Sur<LCL (J)
	0.042	Exclude	UH	0.042	0.27		ug/Kg	HTp>UCL (R)
	0.042	Exclude	UH	0.042	0.27		ug/Kg	RE (Exclude)
Perfluorodecanesulfonic acid (PFDS)	0.049	U	U	0.049	0.19		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.046	U	U	0.046	0.19		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.046	U	U	0.046	0.19		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.029	U	U	0.029	0.19		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.063	U	U	0.063	0.19		ug/Kg	
Perfluorononanesulfonic acid (PFNS)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluorononanoic acid (PFNA)	0.046	J	J	0.021	0.19		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.031	U	U	0.031	0.19		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.21	J	J	0.041	0.28		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.1	J	J	0.05	0.28		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.035	U	U	0.035	0.19		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.039	U	U	0.039	0.19		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.035	U	U	0.035	0.19		ug/Kg	
Perfluorotridecanoic acid (PFTTrDA)	0.021	J	J	0.02	0.19		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.04	U	U	0.04	0.19		ug/Kg	
PFEESA	0.03	U	U	0.03	0.19		ug/Kg	
PFMBA	0.043	UJ	U	0.043	0.19		ug/Kg	Sur<LCL (UJ)
PFMPA	0.023	U	U	0.023	0.19		ug/Kg	
Field ID: APBS1246S002								
102FTSA	0.036	U	U	0.036	0.19		ug/Kg	
11CLPF3OUDSA	0.029	U	U	0.029	0.19		ug/Kg	
3:3 FTCA	0.038	UJ	U*-	0.038	0.19		ug/Kg	LCS<LCL (UJ)
42FTSA	0.048	U	U	0.048	0.19		ug/Kg	
5:3 FTCA	0.036	U	U	0.036	0.19		ug/Kg	
62FTSA	0.025	R	U	0.025	0.28		ug/Kg	Sur<LCL (R)
7:3 FTCA	0.038	UJ	U	0.038	0.19		ug/Kg	Sur<LCL (UJ)
82FTSA	0.033	U	U	0.033	0.19		ug/Kg	
9CLPF3ONSA	0.033	U	U	0.033	0.19		ug/Kg	
ADONA	0.037	U	U	0.037	0.19		ug/Kg	
HFPODA	0.038	U	U	0.038	0.19		ug/Kg	
NETFOSA	0.044	U	U	0.044	0.19		ug/Kg	
NETFOSAA	0.045	U	U	0.045	0.19		ug/Kg	
NETFOSE	0.026	U	U	0.026	0.19		ug/Kg	
NFDHA	0.038	U	U	0.038	0.19		ug/Kg	
NMEFOSA	0.046	U	U	0.046	0.19		ug/Kg	
NMEFOSAA	0.022	UJ	U	0.022	0.19		ug/Kg	Sur<LCL (UJ)
NMEFOSE	0.044	U	U	0.044	0.19		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.044	Exclude	UH	0.044	0.29		ug/Kg	RE (Exclude)

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: APBS1246S002								
	0.17	U	J B	0.043	0.28		ug/Kg	LB<RL (U)
	0.044	Exclude	U H	0.044	0.29		ug/Kg	HTp>UCL (R)
Perfluorodecanesulfonic acid (PFDS)	0.049	U	U	0.049	0.19		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.045	U	U	0.045	0.19		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.046	U	U	0.046	0.19		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.027	U	U	0.027	0.19		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.029	U	U	0.029	0.19		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.062	U	U	0.062	0.19		ug/Kg	
Perfluoronanesulfonic acid (PFNS)	0.027	U	U	0.027	0.19		ug/Kg	
Perfluoronanoic acid (PFNA)	0.021	U	U	0.021	0.19		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.031	U	U	0.031	0.19		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.062	J	J	0.04	0.28		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.12	J	J	0.05	0.28		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.035	U	U	0.035	0.19		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.038	U	U	0.038	0.19		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.035	U	U	0.035	0.19		ug/Kg	
Perfluorotridecanoic acid (PFTrDA)	0.02	U	U	0.02	0.19		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.039	U	U	0.039	0.19		ug/Kg	
PFEESA	0.03	U	U	0.03	0.19		ug/Kg	
PFMBA	0.042	U	U	0.042	0.19		ug/Kg	
PFMPA	0.023	U	U	0.023	0.19		ug/Kg	
Field ID: EVBS2003S001								
102FTSA	0.21			0.038	0.2		ug/Kg	
11CLPF3OUDSA	0.031	U	U	0.031	0.2		ug/Kg	
3:3 FTCA	0.041	UJ	U *-	0.041	0.2		ug/Kg	LCS<LCL (UJ)
42FTSA	0.05	U	U	0.05	0.2		ug/Kg	
5:3 FTCA	0.52			0.038	0.2		ug/Kg	
62FTSA	0.056	J	J	0.027	0.3		ug/Kg	Sur<LCL (J)
7:3 FTCA	0.38	J		0.041	0.2		ug/Kg	Sur<LCL (J)
82FTSA	0.21			0.035	0.2		ug/Kg	
9CLPF3ONSA	0.035	U	U	0.035	0.2		ug/Kg	
ADONA	0.039	U	U	0.039	0.2		ug/Kg	
HFPODA	0.041	U	U	0.041	0.2		ug/Kg	
NETFOSA	0.047	U	U	0.047	0.2		ug/Kg	
NETFOSAA	0.048	U	U	0.048	0.2		ug/Kg	
NETFOSE	0.028	U	U	0.028	0.2		ug/Kg	
NFDHA	0.04	U	U	0.04	0.2		ug/Kg	
NMEFOSA	0.049	U	U	0.049	0.2		ug/Kg	
NMEFOSAA	0.023	U	U	0.023	0.2		ug/Kg	
NMEFOSE	0.047	U	U	0.047	0.2		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.038	U	U	0.038	0.2		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.47	U	B	0.046	0.3		ug/Kg	Sur<LCL (J)
	0.34	Exclude	H	0.043	0.28		ug/Kg	HTp>UCL (J)
	0.34	Exclude	H	0.043	0.28		ug/Kg	RE (Exclude)
	0.47	U	B	0.046	0.3		ug/Kg	LB<RL (U)
Perfluorodecanesulfonic acid (PFDS)	0.051	U	U	0.051	0.2		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.15	J	J	0.048	0.2		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.03	U	U	0.03	0.2		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.049	U	U	0.049	0.2		ug/Kg	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: EVBS2003S001								
Perfluoroheptanoic acid (PFHpA)	0.74			0.038	0.2		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.029	U	U	0.029	0.2		ug/Kg	
Perfluorohexanoic acid (PFHxA)	1.7			0.031	0.2		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.038	U	U	0.038	0.2		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.065	U	U	0.065	0.2		ug/Kg	
Perfluoronanesulfonic acid (PFNS)	0.029	U	U	0.029	0.2		ug/Kg	
Perfluorononanoic acid (PFNA)	0.12	J	J	0.022	0.2		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.033	U	U	0.033	0.2		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.058	J	J	0.043	0.3		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.71			0.052	0.3		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.037	U	U	0.037	0.2		ug/Kg	
Perfluoropentanoic acid (PFPeA)	1.9			0.041	0.2		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.037	U	U	0.037	0.2		ug/Kg	
Perfluorotridecanoic acid (PFTrDA)	0.021	U	U	0.021	0.2		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.042	U	U	0.042	0.2		ug/Kg	
PFEESA	0.032	U	U	0.032	0.2		ug/Kg	
PFMBA	0.045	UJ	U	0.045	0.2		ug/Kg	Sur<LCL (UJ)
PFMPA	0.024	U	U	0.024	0.2		ug/Kg	
Field ID: EVBS2004S001								
102FTSA	0.036	U	U	0.036	0.19		ug/Kg	
11CLPF3OUDSA	0.029	U	U	0.029	0.19		ug/Kg	
3:3 FTCA	0.039	UJ	U *-	0.039	0.19		ug/Kg	LCS<LCL (UJ)
42FTSA	0.048	U	U	0.048	0.19		ug/Kg	
5:3 FTCA	0.12	U	JI	0.036	0.19		ug/Kg	EMPC (U)
62FTSA	0.025	UJ	U	0.025	0.28		ug/Kg	Sur<LCL (UJ)
7:3 FTCA	0.11	J	J	0.039	0.19		ug/Kg	Sur<LCL (J)
82FTSA	0.033	U	U	0.033	0.19		ug/Kg	
9CLPF3ONSA	0.033	U	U	0.033	0.19		ug/Kg	
ADONA	0.037	U	U	0.037	0.19		ug/Kg	
HFPODA	0.039	U	U	0.039	0.19		ug/Kg	
NETFOSA	0.044	U	U	0.044	0.19		ug/Kg	
NETFOSAA	0.045	U	U	0.045	0.19		ug/Kg	
NETFOSE	0.026	U	U	0.026	0.19		ug/Kg	
NFDHA	0.038	U	U	0.038	0.19		ug/Kg	
NMEFOSA	0.046	U	U	0.046	0.19		ug/Kg	
NMEFOSAA	0.022	U	U	0.022	0.19		ug/Kg	
NMEFOSE	0.044	U	U	0.044	0.19		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.17	U	JB	0.043	0.28		ug/Kg	Sur<LCL (J)
	0.17	U	JB	0.043	0.28		ug/Kg	LB<RL (U)
	0.043	Exclude	UH	0.043	0.28		ug/Kg	RE (Exclude)
	0.043	Exclude	UH	0.043	0.28		ug/Kg	HTp>UCL (R)
Perfluorodecanesulfonic acid (PFDS)	0.049	U	U	0.049	0.19		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.045	U	U	0.045	0.19		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.046	U	U	0.046	0.19		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.05	J	J	0.036	0.19		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.027	U	U	0.027	0.19		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.04	J	J	0.029	0.19		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.062	U	U	0.062	0.19		ug/Kg	
Perfluoronanesulfonic acid (PFNS)	0.027	U	U	0.027	0.19		ug/Kg	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: EVBS2004S001								
Perfluorononanoic acid (PFNA)	0.06	J	J	0.021	0.19		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.031	U	U	0.031	0.19		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.29			0.041	0.28		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.41			0.05	0.28		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.035	U	U	0.035	0.19		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.039	J	J	0.039	0.19		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.035	U	U	0.035	0.19		ug/Kg	
Perfluorotridecanoic acid (PFTrDA)	0.02	U	U	0.02	0.19		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.04	U	U	0.04	0.19		ug/Kg	
PFEESA	0.03	U	U	0.03	0.19		ug/Kg	
PFMBA	0.042	UJ	U	0.042	0.19		ug/Kg	Sur<LCL (UJ)
PFMPA	0.023	U	U	0.023	0.19		ug/Kg	

Validation Flag Abbreviations

<i>Abbreviation</i>	<i>Validation Reason</i>	<i>Category</i>
LB<RL	Laboratory blank contamination less than the reporting limit	Blank
HTp>UCL	Holding time exceeded	HoldingTime
LCS<LCL	LCS recovery less than the lower control limit	LaboratoryControlSample
EMPC	Estimated Maximum Possible Concentration	Matrix
MS>UCL	Matrix spike recovery greater than the upper control limit	Matrix
SD<LCL	Matrix spike duplicate recovery criteria less than the lower control limit	Matrix
SD>UCL	Matrix spike duplicate recovery criteria greater than the upper control limit	Matrix
InvalidLabFlag	Removed invalid laboratory flag	Miscellaneous
RE	Re-extraction and/or re-analysis	Re-analysis
Sur<LCL	Surrogate recovery less than the lower control limit	SurrogateRecovery

NASA SSFL CJ063 PFAS PO 148024177

Data Quality Evaluation

SDG: 570-117083-1

Validator/Date:

mfesler

1/9/2023

Method: E537M

Reviewer/Date:

mfesler

1/10/2023

Matrix: Soil/Water

Field Samples

Field blank association lot values: LotNumber / FieldID / SDG

NativeID	QAQC Type	Dilution	EB Lot	TB Lot	AB Lot
SOIL					
AABS1262S001	N	1	07112201 / EBQW2809Q001 / 570-116845-1		
AABS1262S001MS	MS	1			
AABS1262S001SD	SD	1			
AABS1262S002	N	1	07112201 / EBQW2809Q001 / 570-116845-1		
AABS1263S001	N	1	07112201 / EBQW2809Q001 / 570-116845-1		
AABS1264S001	N	1	07112201 / EBQW2809Q001 / 570-116845-1		
WATER					
EBQW2817Q001	EB	1			
FBQW1886Q001	AB	1			

Associated Field Blanks (other SDGs)

NativeID	QAQC Type	Dilution	EB Lot	TB Lot	AB Lot
WATER					
EBQW2809Q001	EB	1	07112201 / EBQW2809Q001 / 570-116845-1		
EBQW2813Q001	EB	1	07112201 / EBQW2809Q001 / 570-116845-1		

1. Case Narrative / Items of Interest

The following items were noted: EMPC; LCS<LCL; MS<LCL; SD<LCL; Sur<LCL

2. Blank Summary

Field Blanks

No Field Blank detects were found.

Method Blanks

No Method Blank detects were found.

3. Spikes and Duplicates

Field Duplicate

No FD Associated.

Laboratory Duplicates

None in this SDG

Matrix Spike

These MS's were out of control: 3:3 FTCA (MS - AABS1262S001MS), 5:3 FTCA (MS - AABS1262S001MS), 7:3 FTCA (MS - AABS1262S001MS), NETFOSA (MS - AABS1262S001MS). These SD's were out of control: 3:3 FTCA (SD - AABS1262S001SD), 5:3 FTCA (SD - AABS1262S001SD), 7:3 FTCA (SD - AABS1262S001SD). All RPD acceptance criteria were met. For high recoveries and associated sample results ND, no flagging applied. For sample AABS1264S001, the ion ratio criteria were not met for PFOS. Associated sample result qualified as ND.

<i>Matrix / Analyte</i>	<i>Sample ID</i>	<i>LR Type</i>	<i>Result</i>	<i>Qualifier</i>	<i>Reason</i>
SOIL	<u>3:3 FTCA</u>				
	AABS1262S001		0.039 ug/Kg	UJ	MS<LCL
	AABS1262S001		0.039 ug/Kg	UJ	SD<LCL
SOIL	<u>5:3 FTCA</u>				
	AABS1262S001		0.036 ug/Kg	none	MS>UCL
	AABS1262S001		0.036 ug/Kg	none	SD>UCL
SOIL	<u>7:3 FTCA</u>				
	AABS1262S001		0.039 ug/Kg	none	MS>UCL
	AABS1262S001		0.039 ug/Kg	none	SD>UCL
SOIL	<u>NETFOSA</u>				
	AABS1262S001		0.045 ug/Kg	none	MS>UCL
SOIL	<u>Perfluorooctanesulfonic acid (PFOS)</u>				
	AABS1264S001		0.17 ug/Kg	U	EMPC

4. Laboratory Control Sample

These LCS analytes were out of control: 11CLPF3OUDSA (BS), 3:3 FTCA (BS), 5:3 FTCA (BS), 7:3 FTCA (BS), ADONA (BD), ADONA (BS), NETFOSA (BD), Perfluoro-n-octadecanoic acid (PFODA) (BD), Perfluorononanesulfonic acid (PFNS) (BS). These LCS RPD analytes were out of control: Perfluoro-n-octadecanoic acid (PFODA) (BS). Sample results ND; no flagging for RPD exceedance

<u>Matrix</u>	<u>QAQC Type</u>	<u>Field ID</u>	<u>Analyte</u>	<u>Recovery</u>	<u>Lower Limit</u>	<u>Upper Limit</u>
WATER	BS	LCS 320-633039/2-A	11CLPF3OUDSA	137	80	131
WATER	BS	LCS 320-633039/2-A	ADONA	138	87	135
WATER	BS	LCS 320-633039/2-A	Perfluorononanesulfonic acid (PFNS)	131	69	127
SOIL	BS	LCS 320-633848/2-A	3:3 FTCA	63	70	130
SOIL	BS	LCS 320-633848/2-A	5:3 FTCA	133	70	130
SOIL	BS	LCS 320-633848/2-A	7:3 FTCA	136	70	130
WATER	BD	LCSD 320-633039/3-A	ADONA	137	87	135
WATER	BD	LCSD 320-633039/3-A	NETFOSA	111	83	110
WATER	BD	LCSD 320-633039/3-A	Perfluoro-n-octadecanoic acid (PFODA)	41	72	134

5. Surrogates

These surrogates were out of control: 13C4 PFBA (AABS1262S002), 13C-6:2 FTCA (AABS1262S001), 13C-6:2 FTCA (AABS1262S001MS), 13C-6:2 FTCA (AABS1262S001SD), 13C-6:2 FTCA (AABS1262S002), 13C-6:2 FTCA (AABS1263S001), 13C-8:2 FTCA (AABS1262S001), 13C-8:2 FTCA (AABS1262S001MS), 13C-8:2 FTCA (AABS1262S001SD), 13C-8:2 FTCA (AABS1262S002), 13C-8:2 FTCA (AABS1263S001), d3-NMeFOSAA (AABS1262S002).

<u>Field ID</u>	<u>LabsampleID</u>	<u>LowerLimit</u>	<u>UpperLimit</u>	<u>Result</u>	<u>Surrogate</u>
AABS1262S001	570-117083-1	50	150	21	13C-6:2 FTCA
AABS1262S001	570-117083-1	50	150	26	13C-8:2 FTCA
AABS1262S001MS	570-117083-1	50	150	21	13C-6:2 FTCA
AABS1262S001MS	570-117083-1	50	150	25	13C-8:2 FTCA
AABS1262S001SD	570-117083-1	50	150	22	13C-6:2 FTCA
AABS1262S001SD	570-117083-1	50	150	25	13C-8:2 FTCA
AABS1262S002	570-117083-2	50	150	42	13C4 PFBA
AABS1262S002	570-117083-2	50	150	13	13C-6:2 FTCA
AABS1262S002	570-117083-2	50	150	15	13C-8:2 FTCA

AABS1262S002	570-117083-2	50	150	46	d3-NMeFOSAA
AABS1263S001	570-117083-3	50	150	33	13C-6:2 FTCA
AABS1263S001	570-117083-3	50	150	32	13C-8:2 FTCA

6. Tuning and Mass Calibration

Tuning and Mass Calibration were not examined by AutoDV.

7. Internal Standard

Internal Standard Area/Retention Time was not examined by AutoDV.

8. Calibration Information

Initial Calibration

Initial Calibration was not examined by AutoDV.

Continuing Calibration

Continuing Calibration was not examined by AutoDV.

9. Holding Time

All acceptance criteria were met.

10. Confirmation

None for this SDG.

11. Summary

General Comments

Field Duplicates: No FD Associated.

Form I Review: These NativeIDs had dilutions or re-extractions that were flagged Exclude: EBQW2817Q001, FBQW1886Q001.

Surrogates: These surrogates were out of control: 13C4 PFBA (AABS1262S002), 13C-6:2 FTCA (AABS1262S001), 13C-6:2 FTCA (AABS1262S001MS), 13C-6:2 FTCA (AABS1262S001SD), 13C-6:2 FTCA (AABS1262S002), 13C-6:2 FTCA (AABS1263S001), 13C-8:2 FTCA (AABS1262S001), 13C-8:2 FTCA (AABS1262S001MS), 13C-8:2 FTCA (AABS1262S001SD), 13C-8:2 FTCA (AABS1262S002), 13C-8:2 FTCA (AABS1263S001), d3-NMeFOSAA (AABS1262S002).

Tuning and Mass Calibration: Tuning and Mass Calibration were not examined by AutoDV.

Internal Standard Area/Retention Time: Internal Standard Area/Retention Time was not examined by AutoDV.

Initial Calibration: Initial Calibration was not examined by AutoDV.

Continuing Calibration: Continuing Calibration was not examined by AutoDV.

Laboratory Control Sample: These LCS analytes were out of control: 11CLPF3OUDSA (BS), 3:3 FTCA (BS), 5:3 FTCA (BS), 7:3 FTCA (BS), ADONA (BD), ADONA (BS), NETFOSA (BD), Perfluoro-n-octadecanoic acid (PFODA) (BD), Perfluorononanesulfonic acid (PFNS) (BS). These LCS RPD analytes were out of control: Perfluoro-n-octadecanoic acid (PFODA) (BS).

VDMS4.59

Data Package Completeness Package was complete for level V validation

Forms Review/ Items of Interest

These NativeIDs had dilutions or re-extractions that were flagged Exclude: EBQW2817Q001, FBQW1886Q001.

COC Review

No discrepancies were noted

Final Data Flags*

*When the data evaluation process results in multiple flags, the most severe flag becomes the final data flag. All flags are from the site-specific QAPP, except the "exclude" flag that is used to designate results that are not for risk assessment (for example, a result from a dilution where the original undiluted result is appropriate).

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: AABS1262S001								
102FTSA	0.036	U	U	0.036	0.19		ug/Kg	
11CLPF3OUDSA	0.03	U	U	0.03	0.19		ug/Kg	
3:3 FTCA	0.039	UJ	U F1 *-	0.039	0.19		ug/Kg	LCS<LCL (UJ)
	0.039	UJ	U F1 *-	0.039	0.19		ug/Kg	MS<LCL (UJ)
	0.039	UJ	U F1 *-	0.039	0.19		ug/Kg	SD<LCL (UJ)
42FTSA	0.049	U	U	0.049	0.19		ug/Kg	
5:3 FTCA	0.036	U	U F1 **	0.036	0.19		ug/Kg	LCS>UCL (none)
	0.036	U	U F1 **	0.036	0.19		ug/Kg	MS>UCL (none)
	0.036	U	U F1 **	0.036	0.19		ug/Kg	SD>UCL (none)
	0.036	U	U F1 **	0.036	0.19		ug/Kg	InvalidLabFlag (U)
62FTSA	0.026	UJ	U	0.026	0.29		ug/Kg	Sur<LCL (UJ)
7:3 FTCA	0.039	UJ	U F1 **	0.039	0.19		ug/Kg	Sur<LCL (UJ)
	0.039	UJ	U F1 **	0.039	0.19		ug/Kg	SD>UCL (none)
	0.039	UJ	U F1 **	0.039	0.19		ug/Kg	LCS>UCL (none)
	0.039	UJ	U F1 **	0.039	0.19		ug/Kg	MS>UCL (none)
82FTSA	0.034	U	U	0.034	0.19		ug/Kg	
9CLPF3ONSA	0.034	U	U	0.034	0.19		ug/Kg	
ADONA	0.037	U	U	0.037	0.19		ug/Kg	
HFPODA	0.039	U	U	0.039	0.19		ug/Kg	
NETFOSA	0.045	U	U	0.045	0.19		ug/Kg	MS>UCL (none)
NETFOSAA	0.046	U	U	0.046	0.19		ug/Kg	
NETFOSE	0.027	U	U	0.027	0.19		ug/Kg	
NFDHA	0.038	U	U	0.038	0.19		ug/Kg	
NMEFOSA	0.047	U	U F1 **	0.047	0.19		ug/Kg	InvalidLabFlag (U)
NMEFOSAA	0.022	U	U	0.022	0.19		ug/Kg	
NMEFOSE	0.045	U	U	0.045	0.19		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.083	J	J	0.044	0.29		ug/Kg	
Perfluorodecanesulfonic acid (PFDS)	0.05	U	U	0.05	0.19		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.046	U	U	0.046	0.19		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.029	U	U	0.029	0.19		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.047	U	U	0.047	0.19		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.03	U	U	0.03	0.19		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.063	U	U	0.063	0.19		ug/Kg	
Perfluorononanesulfonic acid (PFNS)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluorononanoic acid (PFNA)	0.023	J	J	0.021	0.19		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.032	U	U	0.032	0.19		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.096	J	J	0.041	0.29		ug/Kg	
Perfluorooctanoic acid (PFOA)	1.2			0.051	0.29		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.039	U	U	0.039	0.19		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluorotridecanoic acid (PFTTrDA)	0.02	U	U	0.02	0.19		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.04	U	U	0.04	0.19		ug/Kg	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: AABS1262S001								
PFEESA	0.031	U	U	0.031	0.19		ug/Kg	
PFMBA	0.043	U	U	0.043	0.19		ug/Kg	
PFMPA	0.023	U	U	0.023	0.19		ug/Kg	
Field ID: AABS1262S002								
102FTSA	0.036	U	U	0.036	0.19		ug/Kg	
11CLPF3OUDSA	0.03	U	U	0.03	0.19		ug/Kg	
3:3 FTCA	0.039	UJ	U *-	0.039	0.19		ug/Kg	LCS<LCL (UJ)
42FTSA	0.049	U	U	0.049	0.19		ug/Kg	
5:3 FTCA	0.036	U	U *+	0.036	0.19		ug/Kg	InvalidLabFlag (U)
	0.036	U	U *+	0.036	0.19		ug/Kg	LCS>UCL (none)
62FTSA	0.026	UJ	U	0.026	0.29		ug/Kg	Sur<LCL (UJ)
7:3 FTCA	0.039	UJ	U *+	0.039	0.19		ug/Kg	Sur<LCL (UJ)
	0.039	UJ	U *+	0.039	0.19		ug/Kg	LCS>UCL (none)
82FTSA	0.034	U	U	0.034	0.19		ug/Kg	
9CLPF3ONSA	0.034	U	U	0.034	0.19		ug/Kg	
ADONA	0.037	U	U	0.037	0.19		ug/Kg	
HFPODA	0.039	U	U	0.039	0.19		ug/Kg	
NETFOSA	0.045	U	U	0.045	0.19		ug/Kg	
NETFOSAA	0.046	U	U	0.046	0.19		ug/Kg	
NETFOSE	0.027	U	U	0.027	0.19		ug/Kg	
NFDHA	0.038	U	U	0.038	0.19		ug/Kg	
NMEFOSA	0.047	U	U *+	0.047	0.19		ug/Kg	InvalidLabFlag (U)
NMEFOSAA	0.022	UJ	U	0.022	0.19		ug/Kg	Sur<LCL (UJ)
NMEFOSE	0.045	U	U	0.045	0.19		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.044	UJ	U	0.044	0.29		ug/Kg	Sur<LCL (UJ)
Perfluorodecanesulfonic acid (PFDS)	0.05	U	U	0.05	0.19		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.046	U	U	0.046	0.19		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.029	U	U	0.029	0.19		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.047	U	U	0.047	0.19		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.03	U	U	0.03	0.19		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.063	U	U	0.063	0.19		ug/Kg	
Perfluorononanesulfonic acid (PFNS)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluorononanoic acid (PFNA)	0.021	U	U	0.021	0.19		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.032	U	U	0.032	0.19		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.051	J	J	0.041	0.29		ug/Kg	
Perfluorooctanoic acid (PFOA)	2			0.051	0.29		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.035	U	U	0.035	0.19		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.039	U	U	0.039	0.19		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.035	U	U	0.035	0.19		ug/Kg	
Perfluorotridecanoic acid (PFTTrDA)	0.02	U	U	0.02	0.19		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.04	U	U	0.04	0.19		ug/Kg	
PFEESA	0.031	U	U	0.031	0.19		ug/Kg	
PFMBA	0.043	UJ	U	0.043	0.19		ug/Kg	Sur<LCL (UJ)
PFMPA	0.023	U	U	0.023	0.19		ug/Kg	
Field ID: AABS1263S001								
102FTSA	0.037	U	U	0.037	0.2		ug/Kg	
11CLPF3OUDSA	0.03	U	U	0.03	0.2		ug/Kg	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: AABS1263S001								
3:3 FTCA	0.04	UJ	U *-	0.04	0.2		ug/Kg	LCS<LCL (UJ)
42FTSA	0.05	U	U	0.05	0.2		ug/Kg	
5:3 FTCA	0.037	U	U *+	0.037	0.2		ug/Kg	LCS>UCL (none)
	0.037	U	U *+	0.037	0.2		ug/Kg	InvalidLabFlag (U)
62FTSA	0.026	UJ	U	0.026	0.29		ug/Kg	Sur<LCL (UJ)
7:3 FTCA	0.04	UJ	U *+	0.04	0.2		ug/Kg	LCS>UCL (none)
	0.04	UJ	U *+	0.04	0.2		ug/Kg	Sur<LCL (UJ)
82FTSA	0.034	U	U	0.034	0.2		ug/Kg	
9CLPF3ONSA	0.034	U	U	0.034	0.2		ug/Kg	
ADONA	0.038	U	U	0.038	0.2		ug/Kg	
HFPODA	0.04	U	U	0.04	0.2		ug/Kg	
NETFOSA	0.046	U	U	0.046	0.2		ug/Kg	
NETFOSAA	0.047	U	U	0.047	0.2		ug/Kg	
NETFOSE	0.027	U	U	0.027	0.2		ug/Kg	
NFDHA	0.039	U	U	0.039	0.2		ug/Kg	
NMEFOSA	0.048	U	U *+	0.048	0.2		ug/Kg	InvalidLabFlag (U)
NMEFOSAA	0.022	U	U	0.022	0.2		ug/Kg	
NMEFOSE	0.046	U	U	0.046	0.2		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.037	U	U	0.037	0.2		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.045	U	U	0.045	0.29		ug/Kg	
Perfluorodecanesulfonic acid (PFDS)	0.13	J	J	0.051	0.2		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.14	J	J	0.047	0.2		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.071	J	J	0.029	0.2		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.048	U	U	0.048	0.2		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.037	U	U	0.037	0.2		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.028	U	U	0.028	0.2		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.033	J	J	0.03	0.2		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.037	U	U	0.037	0.2		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.064	U	U	0.064	0.2		ug/Kg	
Perfluorononanesulfonic acid (PFNS)	0.028	U	U	0.028	0.2		ug/Kg	
Perfluorononanoic acid (PFNA)	0.037	J	J	0.021	0.2		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.032	U	U	0.032	0.2		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.3			0.042	0.29		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.5			0.052	0.29		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.036	U	U	0.036	0.2		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.04	U	U	0.04	0.2		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.036	U	U	0.036	0.2		ug/Kg	
Perfluorotridecanoic acid (PFTrDA)	0.022	J	J	0.021	0.2		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.078	J	J	0.041	0.2		ug/Kg	
PFEESA	0.031	U	U	0.031	0.2		ug/Kg	
PFMBA	0.044	U	U	0.044	0.2		ug/Kg	
PFMPA	0.023	U	U	0.023	0.2		ug/Kg	
Field ID: AABS1264S001								
102FTSA	0.037	U	U	0.037	0.19		ug/Kg	
11CLPF3OUDSA	0.03	U	U	0.03	0.19		ug/Kg	
3:3 FTCA	0.04	UJ	U *-	0.04	0.19		ug/Kg	LCS<LCL (UJ)
42FTSA	0.049	U	U	0.049	0.19		ug/Kg	
5:3 FTCA	0.037	U	U *+	0.037	0.19		ug/Kg	LCS>UCL (none)
	0.037	U	U *+	0.037	0.19		ug/Kg	InvalidLabFlag (U)
62FTSA	0.026	U	U	0.026	0.29		ug/Kg	
7:3 FTCA	0.04	U	U	0.04	0.19		ug/Kg	LCS>UCL (none)
82FTSA	0.034	U	U	0.034	0.19		ug/Kg	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: AABS1264S001								
9CLPF3ONSA	0.034	U	U	0.034	0.19		ug/Kg	
ADONA	0.038	U	U	0.038	0.19		ug/Kg	
HFPODA	0.04	U	U	0.04	0.19		ug/Kg	
NETFOSA	0.045	U	U	0.045	0.19		ug/Kg	
NETFOSAA	0.046	U	U	0.046	0.19		ug/Kg	
NETFOSE	0.063	J	J	0.027	0.19		ug/Kg	
NFDHA	0.039	U	U	0.039	0.19		ug/Kg	
NMEFOSA	0.047	U	U *+	0.047	0.19		ug/Kg	InvalidLabFlag (U)
NMEFOSAA	0.022	U	U	0.022	0.19		ug/Kg	
NMEFOSE	0.045	U	U	0.045	0.19		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.037	U	U	0.037	0.19		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.044	U	U	0.044	0.29		ug/Kg	
Perfluorodecanesulfonic acid (PFDS)	0.05	U	U	0.05	0.19		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.31			0.046	0.19		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.48			0.029	0.19		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.047	U	U	0.047	0.19		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.037	U	U	0.037	0.19		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.03	U	U	0.03	0.19		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.05	J	J	0.037	0.19		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.064	U	U	0.064	0.19		ug/Kg	
Perfluorononanesulfonic acid (PFNS)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluorononanoic acid (PFNA)	0.12	J	J	0.021	0.19		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.032	U	U	0.032	0.19		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.17	U	J I	0.042	0.29		ug/Kg	EMPC (U)
Perfluorooctanoic acid (PFOA)	0.22	J	J	0.051	0.29		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.04	U	U	0.04	0.19		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.21			0.036	0.19		ug/Kg	
Perfluorotridecanoic acid (PFTTrDA)	0.3			0.02	0.19		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.44			0.041	0.19		ug/Kg	
PFEESA	0.031	U	U	0.031	0.19		ug/Kg	
PFMBA	0.043	U	U	0.043	0.19		ug/Kg	
PFMPA	0.023	U	U	0.023	0.19		ug/Kg	

Validation Flag Abbreviations

<i>Abbreviation</i>	<i>Validation Reason</i>	<i>Category</i>
LCS<LCL	LCS recovery less than the lower control limit	LaboratoryControlSample
LCS>UCL	LCS recovery greater than the upper control limit	LaboratoryControlSample
EMPC	Estimated Maximum Possible Concentration	Matrix
MS<LCL	Matrix spike recovery less than the lower control limit	Matrix
MS>UCL	Matrix spike recovery greater than the upper control limit	Matrix
SD<LCL	Matrix spike duplicate recovery criteria less than the lower control limit	Matrix
SD>UCL	Matrix spike duplicate recovery criteria greater than the upper control limit	Matrix
InvalidLabFlag	Removed invalid laboratory flag	Miscellaneous
Sur<LCL	Surrogate recovery less than the lower control limit	SurrogateRecovery

NASA SSFL CJ063 PFAS PO 148024177

Data Quality Evaluation

SDG: 570-117713-1

Validator/Date:

mfesler

1/9/2023

Method: E537M

Reviewer/Date:

mfesler

1/10/2023

Matrix: Soil/Water

Field Samples

Field blank association lot values: LotNumber / FieldID / SDG

NativeID	QAQC Type	Dilution	EB Lot	TB Lot	AB Lot
SOIL					
BVBS1708S001	N	1	17112201 / EBQW2819Q001 / 570-117713-1		17112201 / FBQW1888Q001 / 570-117713-1
BVBS1708S001MS	MS	1			
BVBS1708S001SD	SD	1			
EVBS2001S001	N	1	17112201 / EBQW2819Q001 / 570-117713-1		17112201 / FBQW1888Q001 / 570-117713-1
EVBS2002S001	N	1	17112201 / EBQW2819Q001 / 570-117713-1		17112201 / FBQW1888Q001 / 570-117713-1
BVBS1708S002	N	1	17112201 / EBQW2819Q001 / 570-117713-1		17112201 / FBQW1888Q001 / 570-117713-1
BVBS1709S001	N	1	17112201 / EBQW2819Q001 / 570-117713-1		17112201 / FBQW1888Q001 / 570-117713-1
EVBS2000D001	FD	1	17112201 / EBQW2819Q001 / 570-117713-1		17112201 / FBQW1888Q001 / 570-117713-1
EVBS2000S001	N	1	17112201 / EBQW2819Q001 / 570-117713-1		17112201 / FBQW1888Q001 / 570-117713-1
WATER					
FBQW1888Q001	AB	1			17112201 / FBQW1888Q001 / 570-117713-1
EBQW2819Q001	EB	1	17112201 / EBQW2819Q001 / 570-117713-1		
EBQW2820Q001	EB	1			

1. Case Narrative / Items of Interest

The following items were noted: EMPC; LCS<LCL; MS<LCL; SD<LCL; Sur<LCL

2. Blank Summary

Field Blanks

No Field Blank detects were found.

Method Blanks

No Method Blank detects were found.

3. Spikes and Duplicates

Field Duplicate

All acceptance criteria were met.

Laboratory Duplicates

None in this SDG

Matrix Spike

These MS's were out of control: 3:3 FTCA (MS - BVBS1708S001MS), 5:3 FTCA (MS - BVBS1708S001MS), 7:3 FTCA (MS - BVBS1708S001MS). These SD's were out of control: 3:3 FTCA (SD - BVBS1708S001SD), 5:3 FTCA (SD - BVBS1708S001SD), 7:3 FTCA (SD - BVBS1708S001SD). These MS/SD RPD's were out of control: 3:3 FTCA (BVBS1708S001). Since native sample result ND for this parameter, no flagging for RPD exceedance. For high recoveries and associated sample results ND, no flagging applied. For sample EVBS2000S001, the ion ratio criteria were not met for NMEFOSAA or PFUnA. Associated sample results qualified as ND.

<i>Matrix / Analyte</i>	<i>Sample ID</i>	<i>LR Type</i>	<i>Result</i>	<i>Qualifier</i>	<i>Reason</i>
SOIL	<u>3:3 FTCA</u>				
	BVBS1708S001		0.041 ug/Kg	UJ	MS<LCL
	BVBS1708S001		0.041 ug/Kg	none	MSRPD
	BVBS1708S001		0.041 ug/Kg	UJ	SD<LCL
SOIL	<u>5:3 FTCA</u>				
	BVBS1708S001		0.038 ug/Kg	none	MS>UCL
	BVBS1708S001		0.038 ug/Kg	none	SD>UCL
SOIL	<u>7:3 FTCA</u>				
	BVBS1708S001		0.041 ug/Kg	none	MS>UCL
	BVBS1708S001		0.041 ug/Kg	none	SD>UCL
SOIL	<u>NMEFOSAA</u>				
	EVBS2000S001		0.023 ug/Kg	U	EMPC
SOIL	<u>Perfluoroundecanoic acid (PFUnA)</u>				
	EVBS2000S001		0.067 ug/Kg	U	EMPC

4. Laboratory Control Sample

These LCS analytes were out of control: 3:3 FTCA (BS). All RPD acceptance criteria were met.

<u>Matrix</u>	<u>QAOC Type</u>	<u>Field ID</u>	<u>Analyte</u>	<u>Recovery</u>	<u>Lower Limit</u>	<u>Upper Limit</u>
SOIL	BS	LCS 320-636358/2-A	3:3 FTCA	53	70	130

5. Surrogates

These surrogates were out of control: 13C2 PFHxDA (BVBS1708S002), 13C2 PFHxDA (EVBS2002S001), 13C2 PFTeDA (BVBS1708S002), 13C4 PFBA (BVBS1708S001SD), 13C4 PFBA (BVBS1708S002), 13C4 PFBA (EVBS2000S001), 13C4 PFBA (EVBS2001S001), 13C4 PFBA (EVBS2002S001), 13C-6:2 FTCA (BVBS1708S001), 13C-6:2 FTCA (BVBS1708S001MS), 13C-6:2 FTCA (BVBS1708S001SD), 13C-6:2 FTCA (BVBS1708S002), 13C-6:2 FTCA (BVBS1709S001), 13C-6:2 FTCA (EVBS2000D001), 13C-6:2 FTCA (EVBS2000S001), 13C-6:2 FTCA (EVBS2001S001), 13C-6:2 FTCA (EVBS2002S001), 13C-8:2 FTCA (BVBS1708S001), 13C-8:2 FTCA (BVBS1708S001MS), 13C-8:2 FTCA (BVBS1708S001SD), 13C-8:2 FTCA (BVBS1708S002), 13C-8:2 FTCA (BVBS1709S001), 13C-8:2 FTCA (EVBS2000D001), 13C-8:2 FTCA (EVBS2000S001), 13C-8:2 FTCA (EVBS2001S001), 13C-8:2 FTCA (EVBS2002S001).

<u>Field ID</u>	<u>LabsampleID</u>	<u>LowerLimit</u>	<u>UpperLimit</u>	<u>Result</u>	<u>Surrogate</u>
BVBS1708S001	570-117713-1	50	150	22	13C-6:2 FTCA
BVBS1708S001	570-117713-1	50	150	26	13C-8:2 FTCA
BVBS1708S001MS	570-117713-1	50	150	24	13C-6:2 FTCA
BVBS1708S001MS	570-117713-1	50	150	28	13C-8:2 FTCA
BVBS1708S001SD	570-117713-1	50	150	47	13C4 PFBA
BVBS1708S001SD	570-117713-1	50	150	23	13C-6:2 FTCA
BVBS1708S001SD	570-117713-1	50	150	30	13C-8:2 FTCA
BVBS1708S002	570-117713-4	50	150	33	13C2 PFHxDA
BVBS1708S002	570-117713-4	50	150	42	13C2 PFTeDA
BVBS1708S002	570-117713-4	50	150	16	13C4 PFBA
BVBS1708S002	570-117713-4	50	150	34	13C-6:2 FTCA
BVBS1708S002	570-117713-4	50	150	42	13C-8:2 FTCA
BVBS1709S001	570-117713-5	50	150	16	13C-6:2 FTCA
BVBS1709S001	570-117713-5	50	150	20	13C-8:2 FTCA
EVBS2000D001	570-117713-8	50	150	10	13C-6:2 FTCA

EVBS2000D001	570-117713-8	50	150	14	13C-8:2 FTCA
EVBS2000S001	570-117713-9	50	150	49	13C4 PFBA
EVBS2000S001	570-117713-9	50	150	11	13C-6:2 FTCA
EVBS2000S001	570-117713-9	50	150	14	13C-8:2 FTCA
EVBS2001S001	570-117713-10	50	150	43	13C4 PFBA
EVBS2001S001	570-117713-10	50	150	23	13C-6:2 FTCA
EVBS2001S001	570-117713-10	50	150	29	13C-8:2 FTCA
EVBS2002S001	570-117713-11	50	150	43	13C2 PFHxDA
EVBS2002S001	570-117713-11	50	150	41	13C4 PFBA
EVBS2002S001	570-117713-11	50	150	22	13C-6:2 FTCA
EVBS2002S001	570-117713-11	50	150	27	13C-8:2 FTCA

6. Tuning and Mass Calibration

Tuning and Mass Calibration were not examined by AutoDV.

7. Internal Standard

Internal Standard Area/Retention Time was not examined by AutoDV.

8. Calibration Information

Initial Calibration

Initial Calibration was not examined by AutoDV.

Continuing Calibration

Continuing Calibration was not examined by AutoDV.

9. Holding Time

All acceptance criteria were met.

10. Confirmation

None for this SDG.

11. Summary

General Comments

Form I Review: These NativeIDs had dilutions or re-extractions that were flagged Exclude: BVBS1708S001, BVBS1708S001MS, BVBS1708S001SD, BVBS1708S002, BVBS1709S001, EVBS2000D001, EVBS2000S001, EVBS2001S001, EVBS2002S001.

Surrogates: These surrogates were out of control: 13C2 PFHxDA (BVBS1708S002), 13C2 PFHxDA (EVBS2002S001), 13C2 PFTeDA (BVBS1708S002), 13C4 PFBA (BVBS1708S001SD), 13C4 PFBA (BVBS1708S002), 13C4 PFBA (EVBS2000S001), 13C4 PFBA (EVBS2001S001), 13C4 PFBA (EVBS2002S001), 13C-6:2 FTCA (BVBS1708S001), 13C-6:2 FTCA (BVBS1708S001MS), 13C-6:2 FTCA (BVBS1708S001SD), 13C-6:2 FTCA (BVBS1708S002), 13C-6:2 FTCA (BVBS1709S001), 13C-6:2 FTCA (EVBS2000D001), 13C-6:2 FTCA (EVBS2000S001), 13C-6:2 FTCA (EVBS2001S001), 13C-6:2 FTCA (EVBS2002S001), 13C-8:2 FTCA (BVBS1708S001), 13C-8:2 FTCA (BVBS1708S001MS), 13C-8:2 FTCA (BVBS1708S001SD), 13C-8:2 FTCA (BVBS1708S002), 13C-8:2 FTCA (BVBS1709S001), 13C-8:2 FTCA (EVBS2000D001), 13C-8:2 FTCA (EVBS2000S001), 13C-8:2 FTCA (EVBS2001S001), 13C-8:2 FTCA (EVBS2002S001).

Tuning and Mass Calibration: Tuning and Mass Calibration were not examined by AutoDV.

Internal Standard Area/Retention Time: Internal Standard Area/Retention Time was not examined by AutoDV.

Initial Calibration: Initial Calibration was not examined by AutoDV.

Continuing Calibration: Continuing Calibration was not examined by AutoDV.

Matrix Spike: These MS's were out of control: 3:3 FTCA (MS - BVBS1708S001MS), 5:3 FTCA (MS - BVBS1708S001MS), 7:3 FTCA (MS - BVBS1708S001MS). These SD's were out of control: 3:3 FTCA (SD - BVBS1708S001SD), 5:3 FTCA (SD - BVBS1708S001SD), 7:3 FTCA (SD - BVBS1708S001SD). These MS/SD RPD's were out of control: 3:3 FTCA (BVBS1708S001). VDMS4.59

Data Package Completeness Package was complete for level V validation

Forms Review/ Items of Interest

These NativeIDs had dilutions or re-extractions that were flagged Exclude: BVBS1708S001, BVBS1708S001MS, BVBS1708S001SD, BVBS1708S002, BVBS1709S001, EVBS2000D001, EVBS2000S001, EVBS2001S001, EVBS2002S001.

Samples re-ext/re-analyzed due to QC issues

COC Review

No discrepancies were noted

Final Data Flags*

*When the data evaluation process results in multiple flags, the most severe flag becomes the final data flag. All flags are from the site-specific QAPP, except the "exclude" flag that is used to designate results that are not for risk assessment (for example, a result from a dilution where the original undiluted result is appropriate).

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: BVBS1708S001								
102FTSA	0.038	U	U	0.038	0.2		ug/Kg	
11CLPF3OUDSA	0.031	U	U	0.031	0.2		ug/Kg	
3:3 FTCA	0.041	UJ	U F2 F1 *-	0.041	0.2		ug/Kg	MSRPD (none)
	0.041	UJ	U F2 F1 *-	0.041	0.2		ug/Kg	LCS<LCL (UJ)
	0.041	UJ	U F2 F1 *-	0.041	0.2		ug/Kg	MCS<LCL (UJ)
	0.041	UJ	U F2 F1 *-	0.041	0.2		ug/Kg	SD<LCL (UJ)
42FTSA	0.05	U	U	0.05	0.2		ug/Kg	
5:3 FTCA	0.038	U	U F1	0.038	0.2		ug/Kg	SD>UCL (none)
	0.038	U	U F1	0.038	0.2		ug/Kg	InvalidLabFlag (U)
	0.038	U	U F1	0.038	0.2		ug/Kg	MS>UCL (none)
62FTSA	0.027	UJ	U	0.027	0.3		ug/Kg	Sur<LCL (UJ)
7:3 FTCA	0.041	UJ	U F1	0.041	0.2		ug/Kg	MS>UCL (none)
	0.041	UJ	U F1	0.041	0.2		ug/Kg	SD>UCL (none)
	0.041	UJ	U F1	0.041	0.2		ug/Kg	Sur<LCL (UJ)
82FTSA	0.035	U	U	0.035	0.2		ug/Kg	
9CLPF3ONSA	0.035	U	U	0.035	0.2		ug/Kg	
ADONA	0.039	U	U	0.039	0.2		ug/Kg	
HFPODA	0.041	U	U	0.041	0.2		ug/Kg	
NETFOSA	0.047	U	U	0.047	0.2		ug/Kg	
NETFOSAA	0.048	U	U	0.048	0.2		ug/Kg	
NETFOSE	0.028	U	U	0.028	0.2		ug/Kg	
NFDHA	0.04	U	U	0.04	0.2		ug/Kg	
NMEFOSA	0.049	U	U	0.049	0.2		ug/Kg	
NMEFOSAA	0.023	U	U	0.023	0.2		ug/Kg	
NMEFOSE	0.047	U	U	0.047	0.2		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.038	U	U	0.038	0.2		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.046	U	U	0.046	0.3		ug/Kg	
Perfluorodecanesulfonic acid (PFDS)	0.051	U	U	0.051	0.2		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.089	J	J	0.048	0.2		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.07	J	J	0.03	0.2		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.049	U	U	0.049	0.2		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.038	U	U	0.038	0.2		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.029	U	U	0.029	0.2		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.031	U	U	0.031	0.2		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.038	U	U	0.038	0.2		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.065	U	U	0.065	0.2		ug/Kg	
Perfluorononanesulfonic acid (PFNS)	0.029	U	U	0.029	0.2		ug/Kg	
Perfluorononanoic acid (PFNA)	0.022	U	U	0.022	0.2		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.033	U	U	0.033	0.2		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.12	J	J	0.043	0.3		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.065	J	J	0.052	0.3		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.037	U	U	0.037	0.2		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.041	U	U	0.041	0.2		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.037	U	U	0.037	0.2		ug/Kg	
Perfluorotridecanoic acid (PFTTrDA)	0.034	J	J	0.021	0.2		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.061	J	J	0.042	0.2		ug/Kg	
PFEESA	0.032	U	U	0.032	0.2		ug/Kg	

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Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: BVBS1708S001								
PFMBA	0.045	U	U	0.045	0.2		ug/Kg	
PFMPA	0.024	U	U	0.024	0.2		ug/Kg	
Field ID: EVBS2001S001								
102FTSA	0.034	U	U	0.034	0.18		ug/Kg	
11CLPF3OUDSA	0.028	U	U	0.028	0.18		ug/Kg	
3:3 FTCA	0.037	UJ	U *-	0.037	0.18		ug/Kg	LCS<LCL (UJ)
42FTSA	0.046	U	U	0.046	0.18		ug/Kg	
5:3 FTCA	0.034	U	U	0.034	0.18		ug/Kg	
62FTSA	0.024	UJ	U	0.024	0.27		ug/Kg	Sur<LCL (UJ)
7:3 FTCA	0.037	UJ	U	0.037	0.18		ug/Kg	Sur<LCL (UJ)
82FTSA	0.031	U	U	0.031	0.18		ug/Kg	
9CLPF3ONSA	0.031	U	U	0.031	0.18		ug/Kg	
ADONA	0.035	U	U	0.035	0.18		ug/Kg	
HFPODA	0.037	U	U	0.037	0.18		ug/Kg	
NETFOSA	0.042	U	U	0.042	0.18		ug/Kg	
NETFOSAA	0.043	U	U	0.043	0.18		ug/Kg	
NETFOSE	0.025	U	U	0.025	0.18		ug/Kg	
NFDHA	0.036	U	U	0.036	0.18		ug/Kg	
NMEFOSA	0.044	U	U	0.044	0.18		ug/Kg	
NMEFOSAA	0.021	U	U	0.021	0.18		ug/Kg	
NMEFOSE	0.042	U	U	0.042	0.18		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.034	U	U	0.034	0.18		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.09	J	J	0.041	0.27		ug/Kg	Sur<LCL (J)
Perfluorodecanesulfonic acid (PFDS)	0.047	U	U	0.047	0.18		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.12	J	J	0.043	0.18		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.036	J	J	0.027	0.18		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.044	U	U	0.044	0.18		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.039	J	J	0.034	0.18		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.026	U	U	0.026	0.18		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.028	U	U	0.028	0.18		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.034	U	U	0.034	0.18		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.059	U	U	0.059	0.18		ug/Kg	
Perfluorononanesulfonic acid (PFNS)	0.026	U	U	0.026	0.18		ug/Kg	
Perfluorononanoic acid (PFNA)	0.062	J	J	0.02	0.18		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.03	U	U	0.03	0.18		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.34			0.039	0.27		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.38			0.048	0.27		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.033	U	U	0.033	0.18		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.037	U	U	0.037	0.18		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.033	U	U	0.033	0.18		ug/Kg	
Perfluorotridecanoic acid (PFTTrDA)	0.019	U	U	0.019	0.18		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.038	U	U	0.038	0.18		ug/Kg	
PFEESA	0.029	U	U	0.029	0.18		ug/Kg	
PFMBA	0.04	UJ	U	0.04	0.18		ug/Kg	Sur<LCL (UJ)
PFMPA	0.022	U	U	0.022	0.18		ug/Kg	
Field ID: EVBS2002S001								
102FTSA	0.036	U	U	0.036	0.19		ug/Kg	
11CLPF3OUDSA	0.03	UJ	U	0.03	0.19		ug/Kg	Sur<LCL (UJ)
3:3 FTCA	0.039	UJ	U *-	0.039	0.19		ug/Kg	LCS<LCL (UJ)
42FTSA	0.049	U	U	0.049	0.19		ug/Kg	
5:3 FTCA	0.045	J	J	0.036	0.19		ug/Kg	

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Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: EVBS2002S001								
62FTSA	0.026	UJ	U	0.026	0.29		ug/Kg	Sur<LCL (UJ)
7:3 FTCA	0.07	J	J	0.039	0.19		ug/Kg	Sur<LCL (J)
82FTSA	0.033	U	U	0.033	0.19		ug/Kg	
9CLPF3ONSA	0.033	UJ	U	0.033	0.19		ug/Kg	Sur<LCL (UJ)
ADONA	0.037	U	U	0.037	0.19		ug/Kg	
HFPODA	0.039	U	U	0.039	0.19		ug/Kg	
NETFOSA	0.045	U	U	0.045	0.19		ug/Kg	
NETFOSAA	0.046	U	U	0.046	0.19		ug/Kg	
NETFOSE	0.027	U	U	0.027	0.19		ug/Kg	
NFDHA	0.038	U	U	0.038	0.19		ug/Kg	
NMEFOSA	0.047	U	U	0.047	0.19		ug/Kg	
NMEFOSAA	0.044	J	J	0.022	0.19		ug/Kg	
NMEFOSE	0.066	J	J	0.045	0.19		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.095	J	J	0.044	0.29		ug/Kg	Sur<LCL (J)
Perfluorodecanesulfonic acid (PFDS)	0.05	U	U	0.05	0.19		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.31			0.046	0.19		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.14	J	J	0.029	0.19		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.047	U	U	0.047	0.19		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.03	U	U	0.03	0.19		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.043	J	J	0.036	0.19		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.063	U	U	0.063	0.19		ug/Kg	
Perfluorononanesulfonic acid (PFNS)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluorononanoic acid (PFNA)	0.098	J	J	0.021	0.19		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.031	U	U	0.031	0.19		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.51			0.041	0.29		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.22	J	J	0.05	0.29		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.035	U	U	0.035	0.19		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.039	U	U	0.039	0.19		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.08	J	J	0.035	0.19		ug/Kg	
Perfluorotridecanoic acid (PFTTrDA)	0.068	J	J	0.02	0.19		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.1	J	J	0.04	0.19		ug/Kg	
PFEESA	0.03	U	U	0.03	0.19		ug/Kg	
PFMBA	0.043	UJ	U	0.043	0.19		ug/Kg	Sur<LCL (UJ)
PFMPA	0.023	U	U	0.023	0.19		ug/Kg	
Field ID: BVBS1708S002								
102FTSA	0.038	U	U	0.038	0.2		ug/Kg	
11CLPF3OUDSA	0.031	UJ	U	0.031	0.2		ug/Kg	Sur<LCL (UJ)
3:3 FTCA	0.041	UJ	U*-	0.041	0.2		ug/Kg	LCS<LCL (UJ)
42FTSA	0.051	U	U	0.051	0.2		ug/Kg	
5:3 FTCA	0.038	U	U	0.038	0.2		ug/Kg	
62FTSA	0.027	UJ	U	0.027	0.3		ug/Kg	Sur<LCL (UJ)
7:3 FTCA	0.041	UJ	U	0.041	0.2		ug/Kg	Sur<LCL (UJ)
82FTSA	0.035	U	U	0.035	0.2		ug/Kg	
9CLPF3ONSA	0.035	UJ	U	0.035	0.2		ug/Kg	Sur<LCL (UJ)
ADONA	0.039	U	U	0.039	0.2		ug/Kg	
HFPODA	0.041	U	U	0.041	0.2		ug/Kg	
NETFOSA	0.047	U	U	0.047	0.2		ug/Kg	
NETFOSAA	0.048	U	U	0.048	0.2		ug/Kg	
NETFOSE	0.028	U	U	0.028	0.2		ug/Kg	

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Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: BVBS1708S002								
NFDHA	0.04	U	U	0.04	0.2		ug/Kg	
NMEFOSA	0.049	U	U	0.049	0.2		ug/Kg	
NMEFOSAA	0.023	U	U	0.023	0.2		ug/Kg	
NMEFOSE	0.047	U	U	0.047	0.2		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.038	U	U	0.038	0.2		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.046	UJ	U	0.046	0.3		ug/Kg	Sur<LCL (UJ)
Perfluorodecanesulfonic acid (PFDS)	0.052	U	U	0.052	0.2		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.048	U	U	0.048	0.2		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.03	U	U	0.03	0.2		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.049	U	U	0.049	0.2		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.038	U	U	0.038	0.2		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.029	U	U	0.029	0.2		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.031	U	U	0.031	0.2		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.038	U	U	0.038	0.2		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.066	U	U	0.066	0.2		ug/Kg	
Perfluorononanesulfonic acid (PFNS)	0.029	U	U	0.029	0.2		ug/Kg	
Perfluorononanoic acid (PFNA)	0.022	U	U	0.022	0.2		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.033	U	U	0.033	0.2		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.055	J	J	0.043	0.3		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.092	J	J	0.053	0.3		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.037	U	U	0.037	0.2		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.041	U	U	0.041	0.2		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.037	UJ	U	0.037	0.2		ug/Kg	Sur<LCL (UJ)
Perfluorotridecanoic acid (PFTrDA)	0.021	U	U	0.021	0.2		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.042	U	U	0.042	0.2		ug/Kg	
PFEESA	0.032	U	U	0.032	0.2		ug/Kg	
PFMBA	0.045	UJ	U	0.045	0.2		ug/Kg	Sur<LCL (UJ)
PFMPA	0.024	U	U	0.024	0.2		ug/Kg	
Field ID: BVBS1709S001								
102FTSA	0.035	U	U	0.035	0.18		ug/Kg	
11CLPF3OUDSA	0.028	U	U	0.028	0.18		ug/Kg	
3:3 FTCA	0.038	UJ	U *-	0.038	0.18		ug/Kg	LCS<LCL (UJ)
42FTSA	0.047	U	U	0.047	0.18		ug/Kg	
5:3 FTCA	0.035	U	U	0.035	0.18		ug/Kg	
62FTSA	0.025	UJ	U	0.025	0.28		ug/Kg	Sur<LCL (UJ)
7:3 FTCA	0.038	UJ	U	0.038	0.18		ug/Kg	Sur<LCL (UJ)
82FTSA	0.032	U	U	0.032	0.18		ug/Kg	
9CLPF3ONSA	0.032	U	U	0.032	0.18		ug/Kg	
ADONA	0.036	U	U	0.036	0.18		ug/Kg	
HFPODA	0.038	U	U	0.038	0.18		ug/Kg	
NETFOSA	0.043	U	U	0.043	0.18		ug/Kg	
NETFOSAA	0.044	U	U	0.044	0.18		ug/Kg	
NETFOSE	0.026	U	U	0.026	0.18		ug/Kg	
NFDHA	0.037	U	U	0.037	0.18		ug/Kg	
NMEFOSA	0.045	U	U	0.045	0.18		ug/Kg	
NMEFOSAA	0.021	U	U	0.021	0.18		ug/Kg	
NMEFOSE	0.043	U	U	0.043	0.18		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.035	U	U	0.035	0.18		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.042	U	U	0.042	0.28		ug/Kg	
Perfluorodecanesulfonic acid (PFDS)	0.048	U	U	0.048	0.18		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.094	J	J	0.044	0.18		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.037	J	J	0.028	0.18		ug/Kg	

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Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: BVBS1709S001								
Perfluoroheptanesulfonic acid (PFHpS)	0.045	U	U	0.045	0.18		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.035	U	U	0.035	0.18		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.027	U	U	0.027	0.18		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.028	U	U	0.028	0.18		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.035	U	U	0.035	0.18		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.061	U	U	0.061	0.18		ug/Kg	
Perfluorononanesulfonic acid (PFNS)	0.027	U	U	0.027	0.18		ug/Kg	
Perfluorononanoic acid (PFNA)	0.027	J	J	0.02	0.18		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.03	U	U	0.03	0.18		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.09	J	J	0.039	0.28		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.088	J	J	0.049	0.28		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.034	U	U	0.034	0.18		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.038	U	U	0.038	0.18		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.034	U	U	0.034	0.18		ug/Kg	
Perfluorotridecanoic acid (PFTrDA)	0.019	U	U	0.019	0.18		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.056	J	J	0.039	0.18		ug/Kg	
PFEESA	0.029	U	U	0.029	0.18		ug/Kg	
PFMBA	0.041	U	U	0.041	0.18		ug/Kg	
PFMPA	0.022	U	U	0.022	0.18		ug/Kg	
Field ID: EVBS2000D001								
102FTSA	0.036	U	U	0.036	0.19		ug/Kg	
11CLPF3OUDSA	0.03	U	U	0.03	0.19		ug/Kg	
3:3 FTCA	0.039	UJ	U*-	0.039	0.19		ug/Kg	LCS<LCL (UJ)
42FTSA	0.049	U	U	0.049	0.19		ug/Kg	
5:3 FTCA	0.036	U	U	0.036	0.19		ug/Kg	
62FTSA	0.026	UJ	U	0.026	0.29		ug/Kg	Sur<LCL (UJ)
7:3 FTCA	0.11	J	J	0.039	0.19		ug/Kg	Sur<LCL (J)
82FTSA	0.034	U	U	0.034	0.19		ug/Kg	
9CLPF3ONSA	0.034	U	U	0.034	0.19		ug/Kg	
ADONA	0.037	U	U	0.037	0.19		ug/Kg	
HFPODA	0.039	U	U	0.039	0.19		ug/Kg	
NETFOSA	0.045	U	U	0.045	0.19		ug/Kg	
NETFOSAA	0.12	J	J	0.046	0.19		ug/Kg	
NETFOSE	0.027	U	U	0.027	0.19		ug/Kg	
NFDHA	0.038	U	U	0.038	0.19		ug/Kg	
NMEFOSA	0.047	U	U	0.047	0.19		ug/Kg	
NMEFOSAA	0.022	U	U	0.022	0.19		ug/Kg	
NMEFOSE	0.045	U	U	0.045	0.19		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.059	J	J	0.044	0.29		ug/Kg	
Perfluorodecanesulfonic acid (PFDS)	0.091	J	J	0.05	0.19		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.057	J	J	0.046	0.19		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.17	J	J	0.029	0.19		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.047	U	U	0.047	0.19		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.03	U	U	0.03	0.19		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.063	U	U	0.063	0.19		ug/Kg	
Perfluorononanesulfonic acid (PFNS)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluorononanoic acid (PFNA)	0.021	U	U	0.021	0.19		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.04	J	J	0.032	0.19		ug/Kg	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: EVBS2000D001								
Perfluorooctanesulfonic acid (PFOS)	0.19	J	J	0.041	0.29		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.35			0.051	0.29		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.035	U	U	0.035	0.19		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.039	U	U	0.039	0.19		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.059	J	J	0.035	0.19		ug/Kg	
Perfluorotridecanoic acid (PFTTrDA)	0.061	J	J	0.02	0.19		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.061	J	J	0.04	0.19		ug/Kg	
PFEESA	0.031	U	U	0.031	0.19		ug/Kg	
PFMBA	0.043	U	U	0.043	0.19		ug/Kg	
PFMPA	0.023	U	U	0.023	0.19		ug/Kg	
Field ID: EVBS2000S001								
102FTSA	0.037	U	U	0.037	0.2		ug/Kg	
11CLPF3OUDSA	0.03	U	U	0.03	0.2		ug/Kg	
3:3 FTCA	0.04	UJ	U *	0.04	0.2		ug/Kg	LCS<LCL (UJ)
42FTSA	0.05	U	U	0.05	0.2		ug/Kg	
5:3 FTCA	0.037	U	U	0.037	0.2		ug/Kg	
62FTSA	0.026	UJ	U	0.026	0.29		ug/Kg	Sur<LCL (UJ)
7:3 FTCA	0.13	J	J	0.04	0.2		ug/Kg	Sur<LCL (J)
82FTSA	0.034	U	U	0.034	0.2		ug/Kg	
9CLPF3ONSA	0.034	U	U	0.034	0.2		ug/Kg	
ADONA	0.038	U	U	0.038	0.2		ug/Kg	
HFPODA	0.04	U	U	0.04	0.2		ug/Kg	
NETFOSA	0.046	U	U	0.046	0.2		ug/Kg	
NETFOSAA	0.18	J	J	0.047	0.2		ug/Kg	
NETFOSE	0.027	U	U	0.027	0.2		ug/Kg	
NFDHA	0.039	U	U	0.039	0.2		ug/Kg	
NMEFOSA	0.048	U	U	0.048	0.2		ug/Kg	
NMEFOSAA	0.023	U	J I	0.023	0.2		ug/Kg	EMPC (U)
NMEFOSE	0.046	U	U	0.046	0.2		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.037	U	U	0.037	0.2		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.063	J	J	0.045	0.29		ug/Kg	Sur<LCL (J)
Perfluorodecanesulfonic acid (PFDS)	0.087	J	J	0.051	0.2		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.052	J	J	0.047	0.2		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.17	J	J	0.029	0.2		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.048	U	U	0.048	0.2		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.037	U	U	0.037	0.2		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.028	U	U	0.028	0.2		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.035	J	J	0.03	0.2		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.037	U	U	0.037	0.2		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.065	U	U	0.065	0.2		ug/Kg	
Perfluorononanesulfonic acid (PFNS)	0.028	U	U	0.028	0.2		ug/Kg	
Perfluorononanoic acid (PFNA)	0.022	U	U	0.022	0.2		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.04	J	J	0.032	0.2		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.17	J	J	0.042	0.29		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.4			0.052	0.29		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.036	U	U	0.036	0.2		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.04	U	U	0.04	0.2		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.066	J	J	0.036	0.2		ug/Kg	
Perfluorotridecanoic acid (PFTTrDA)	0.061	J	J	0.021	0.2		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.067	U	J I	0.041	0.2		ug/Kg	EMPC (U)
PFEESA	0.031	U	U	0.031	0.2		ug/Kg	
PFMBA	0.044	UJ	U	0.044	0.2		ug/Kg	Sur<LCL (UJ)

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: EVBS2000S001								
PFMPA	0.023	U	U	0.023	0.2		ug/Kg	

Validation Flag Abbreviations

<i>Abbreviation</i>	<i>Validation Reason</i>	<i>Category</i>
LCS<LCL	LCS recovery less than the lower control limit	LaboratoryControlSample
EMPC	Estimated Maximum Possible Concentration	Matrix
MS<LCL	Matrix spike recovery less than the lower control limit	Matrix
MS>UCL	Matrix spike recovery greater than the upper control limit	Matrix
MSRPD	Matrix spike RPD criteria exceedance	Matrix
SD<LCL	Matrix spike duplicate recovery criteria less than the lower control limit	Matrix
SD>UCL	Matrix spike duplicate recovery criteria greater than the upper control limit	Matrix
InvalidLabFlag	Removed invalid laboratory flag	Miscellaneous
RE	Re-extraction and/or re-analysis	Re-analysis
Sur<LCL	Surrogate recovery less than the lower control limit	SurrogateRecovery

NASA SSFL CJ063 PFAS PO 148024177

Data Quality Evaluation

SDG: 570-117717-1

Validator/Date:

mfesler

1/9/2023

Method: E537M

Reviewer/Date:

mfesler

1/10/2023

Matrix: Soil/Water

Field Samples

Field blank association lot values: LotNumber / FieldID / SDG

NativeID	QAQC Type	Dilution	EB Lot	TB Lot	AB Lot
SOIL					
CABS1324S001	N	1	14112201 / EBQW2818Q001 / 570-117717-1		14112201 / FBQW1887Q001 / 570-117717-1
CABS1324S002	N	1	14112201 / EBQW2818Q001 / 570-117717-1		14112201 / FBQW1887Q001 / 570-117717-1
CABS1325S001	N	1	14112201 / EBQW2818Q001 / 570-117717-1		14112201 / FBQW1887Q001 / 570-117717-1
CABS1325S002	N	1	14112201 / EBQW2818Q001 / 570-117717-1		14112201 / FBQW1887Q001 / 570-117717-1
CABS1325S002MS	MS	1			
CABS1325S002SD	SD	1			
WATER					
EBQW2818Q001	EB	1	14112201 / EBQW2818Q001 / 570-117717-1		
FBQW1887Q001	AB	1			14112201 / FBQW1887Q001 / 570-117717-1

1. Case Narrative / Items of Interest

The following items were noted: Sur<LCL

2. Blank Summary

Field Blanks

No Field Blank detects were found.

Method Blanks

No Method Blank detects were found.

3. Spikes and Duplicates

Field Duplicate

No FD Associated.

Laboratory Duplicates

None in this SDG

Matrix Spike

These MS's were out of control: 5:3 FTCA (MS - CABS1325S002MS), 7:3 FTCA (MS - CABS1325S002MS). These SD's were out of control: 5:3 FTCA (SD - CABS1325S002SD), 7:3 FTCA (SD - CABS1325S002SD). Since recoveries out high and sample results ND, no flagging applied. All RPD acceptance criteria were met.

Matrix / Analyte	Sample ID	LR Type	Result	Qualifier	Reason
SOIL	5:3 FTCA				

		CABS1325S002	0.037 ug/Kg	none	MS>UCL
		CABS1325S002	0.037 ug/Kg	none	SD>UCL
SOIL	<u>7:3 FTCA</u>				
		CABS1325S002	0.039 ug/Kg	none	MS>UCL
		CABS1325S002	0.039 ug/Kg	none	SD>UCL

4. Laboratory Control Sample

These LCS analytes were out of control: 5:3 FTCA (BS), 7:3 FTCA (BS). Since recoveries out high and sample results ND, no flagging applied. All RPD acceptance criteria were met.

<u>Matrix</u>	<u>QAOC Type</u>	<u>Field ID</u>	<u>Analyte</u>	<u>Recovery</u>	<u>Lower Limit</u>	<u>Upper Limit</u>
SOIL	BS	LCS 320-635791/2-A	5:3 FTCA	362	70	130
SOIL	BS	LCS 320-635791/2-A	7:3 FTCA	267	70	130

5. Surrogates

These surrogates were out of control: 13C2 10:2 FTS (FBQW1887Q001), 13C2 4:2 FTS (FBQW1887Q001), 13C2 6:2 FTS (FBQW1887Q001), 13C2 8:2 FTS (FBQW1887Q001), 13C2 PFDA (FBQW1887Q001), 13C2 PFD_oA (FBQW1887Q001), 13C2 PFH_xA (FBQW1887Q001), 13C2 PFH_xDA (CABS1325S001), 13C2 PFH_xDA (CABS1325S002), 13C2 PFH_xDA (CABS1325S002SD), 13C2 PFH_xDA (FBQW1887Q001), 13C2 PFT_eDA (CABS1325S001), 13C2 PFT_eDA (FBQW1887Q001), 13C2 PFU_nA (FBQW1887Q001), 13C3 HFPO-DA (FBQW1887Q001), 13C3 PFBS (FBQW1887Q001), 13C4 PFBA (FBQW1887Q001), 13C4 PFH_pA (FBQW1887Q001), 13C4 PFOA (FBQW1887Q001), 13C4 PFOS (FBQW1887Q001), 13C5 PFNA (FBQW1887Q001), 13C5 PFPeA (FBQW1887Q001), 13C-6:2 FTCA (CABS1324S001), 13C-6:2 FTCA (CABS1324S002), 13C-6:2 FTCA (CABS1325S001), 13C-6:2 FTCA (CABS1325S002), 13C-6:2 FTCA (CABS1325S002MS), 13C-6:2 FTCA (CABS1325S002SD), 13C-6:2 FTCA (FBQW1887Q001), 13C-6:2 FTCA (LCS 320-635791/2-A), 13C-6:2 FTCA (MB 320-635791/1-A), 13C8 FOSA (FBQW1887Q001), 13C-8:2 FTCA (CABS1324S001), 13C-8:2 FTCA (CABS1324S002), 13C-8:2 FTCA (CABS1325S001), 13C-8:2 FTCA (CABS1325S002), 13C-8:2 FTCA (CABS1325S002MS), 13C-8:2 FTCA (CABS1325S002SD), 13C-8:2 FTCA (FBQW1887Q001), 13C-8:2 FTCA (LCS 320-635791/2-A), 13C-8:2 FTCA (MB 320-635791/1-A), 18O2 PFH_xS (FBQW1887Q001), d3-NMeFOSAA (FBQW1887Q001), d5-NEtFOSAA (FBQW1887Q001), d7-N-MeFOSE-M (CABS1325S001), d7-N-MeFOSE-M (FBQW1887Q001), d9-N-EtFOSE-M (CABS1325S001), d9-N-EtFOSE-M (FBQW1887Q001), d-N-EtFOSA-M (FBQW1887Q001), d-N-MeFOSA-M (FBQW1887Q001).

<u>Field ID</u>	<u>LabsampleID</u>	<u>LowerLimit</u>	<u>UpperLimit</u>	<u>Result</u>	<u>Surrogate</u>
CABS1324S001	570-117717-1	50	150	31	13C-6:2 FTCA
CABS1324S001	570-117717-1	50	150	0	13C-6:2 FTCA
CABS1324S001	570-117717-1	50	150	0	13C-8:2 FTCA
CABS1324S001	570-117717-1	50	150	39	13C-8:2 FTCA
CABS1324S002	570-117717-2	50	150	0.9	13C-6:2 FTCA
CABS1324S002	570-117717-2	50	150	24	13C-6:2 FTCA
CABS1324S002	570-117717-2	50	150	2	13C-8:2 FTCA
CABS1324S002	570-117717-2	50	150	29	13C-8:2 FTCA
CABS1325S001	570-117717-3	50	150	23	13C2 PFH _x DA
CABS1325S001	570-117717-3	50	150	23	13C2 PFT _e DA
CABS1325S001	570-117717-3	50	150	0.9	13C-6:2 FTCA
CABS1325S001	570-117717-3	50	150	37	13C-6:2 FTCA
CABS1325S001	570-117717-3	50	150	1	13C-8:2 FTCA
CABS1325S001	570-117717-3	50	150	45	13C-8:2 FTCA
CABS1325S001	570-117717-3	50	150	49	d7-N-MeFOSE-M
CABS1325S001	570-117717-3	50	150	36	d9-N-EtFOSE-M
CABS1325S002	570-117717-4	50	150	45	13C2 PFH _x DA
CABS1325S002	570-117717-4	50	150	30	13C-6:2 FTCA
CABS1325S002	570-117717-4	50	150	2	13C-6:2 FTCA
CABS1325S002	570-117717-4	50	150	3	13C-8:2 FTCA
CABS1325S002	570-117717-4	50	150	33	13C-8:2 FTCA
CABS1325S002MS	570-117717-4	50	150	3	13C-6:2 FTCA
CABS1325S002MS	570-117717-4	50	150	5	13C-8:2 FTCA

CABS1325S002SD	570-117717-4	50	150	48	13C2 PFHxDA
CABS1325S002SD	570-117717-4	50	150	3	13C-6:2 FTCA
CABS1325S002SD	570-117717-4	50	150	6	13C-8:2 FTCA
FBQW1887Q001	570-117717-6	50	150	3	13C2 10:2 FTS
FBQW1887Q001	570-117717-6	50	150	0.7	13C2 4:2 FTS
FBQW1887Q001	570-117717-6	50	150	1	13C2 6:2 FTS
FBQW1887Q001	570-117717-6	50	150	1	13C2 8:2 FTS
FBQW1887Q001	570-117717-6	50	150	1	13C2 PFDA
FBQW1887Q001	570-117717-6	50	150	3	13C2 PFDaA
FBQW1887Q001	570-117717-6	50	150	0.6	13C2 PFHxA
FBQW1887Q001	570-117717-6	50	150	4	13C2 PFHxDA
FBQW1887Q001	570-117717-6	50	150	4	13C2 PFTeDA
FBQW1887Q001	570-117717-6	50	150	2	13C2 PFUnA
FBQW1887Q001	570-117717-6	50	150	0.5	13C3 HFPO-DA
FBQW1887Q001	570-117717-6	50	150	1	13C3 PFBS
FBQW1887Q001	570-117717-6	50	150	0.5	13C4 PFBA
FBQW1887Q001	570-117717-6	50	150	0.6	13C4 PFHpA
FBQW1887Q001	570-117717-6	50	150	0.8	13C4 PFOA
FBQW1887Q001	570-117717-6	50	150	1	13C4 PFOS
FBQW1887Q001	570-117717-6	50	150	0.8	13C5 PFNA
FBQW1887Q001	570-117717-6	50	150	0.5	13C5 PFPeA
FBQW1887Q001	570-117717-6	50	150	0.7	13C-6:2 FTCA
FBQW1887Q001	570-117717-6	50	150	3	13C8 FOSA
FBQW1887Q001	570-117717-6	50	150	1	13C-8:2 FTCA
FBQW1887Q001	570-117717-6	50	150	1	18O2 PFHxS
FBQW1887Q001	570-117717-6	50	150	2	d3-NMeFOSAA
FBQW1887Q001	570-117717-6	50	150	3	d5-NEtFOSAA
FBQW1887Q001	570-117717-6	50	150	2	d7-N-MeFOSE-M
FBQW1887Q001	570-117717-6	50	150	2	d9-N-EtFOSE-M
FBQW1887Q001	570-117717-6	50	150	2	d-N-EtFOSA-M
FBQW1887Q001	570-117717-6	50	150	2	d-N-MeFOSA-M
LCS 320-635791/2-A	LCS 320-635791/	50	150	26	13C-6:2 FTCA
LCS 320-635791/2-A	LCS 320-635791/	50	150	33	13C-8:2 FTCA
MB 320-635791/1-A	MB 320-635791/1-	50	150	14	13C-6:2 FTCA
MB 320-635791/1-A	MB 320-635791/1-	50	150	19	13C-8:2 FTCA

6. Tuning and Mass Calibration

Tuning and Mass Calibration were not examined by AutoDV.

7. Internal Standard

Internal Standard Area/Retention Time was not examined by AutoDV.

8. Calibration Information

Initial Calibration

Initial Calibration was not examined by AutoDV.

Continuing Calibration

Continuing Calibration was not examined by AutoDV.

9. Holding Time

These NativeIDs exceeded holding time: CABS1324S001, CABS1324S002, CABS1325S001, CABS1325S002. For re-ext/re-analysis of analytes 5:3 FTCA and 7:3 FTCA. Original results to be reported; no flagging for HT exceedance

<u>Field ID</u>	<u>LabsampleID</u>	<u>AnalysisDate</u>	<u>ExtractDate</u>	<u>Sample Date</u>	<u>Method</u>	<u>Time</u>	<u>Actual</u>	<u>HT</u>
CABS1324S001	570-117717-1	12/14/2022	12/13/2022	11/14/2022	14			29
CABS1324S002	570-117717-2	12/14/2022	12/13/2022	11/14/2022	14			29
CABS1325S001	570-117717-3	12/14/2022	12/13/2022	11/14/2022	14			29
CABS1325S002	570-117717-4	12/14/2022	12/13/2022	11/14/2022	14			29

10. Confirmation

None for this SDG.

11. Summary

General Comments

Field Duplicates: No FD Associated.

Form I Review: These NativeIDs had dilutions or re-extractions that were flagged Exclude: CABS1324S001, CABS1324S002, CABS1325S001, CABS1325S002, FBQW1887Q001.

Surrogates: These surrogates were out of control: 13C2 10:2 FTS (FBQW1887Q001), 13C2 4:2 FTS (FBQW1887Q001), 13C2 6:2 FTS (FBQW1887Q001), 13C2 8:2 FTS (FBQW1887Q001), 13C2 PFDA (FBQW1887Q001), 13C2 PFD_oA (FBQW1887Q001), 13C2 PFH_xA (FBQW1887Q001), 13C2 PFH_xDA (CABS1325S001), 13C2 PFH_xDA (CABS1325S002), 13C2 PFH_xDA (CABS1325S002SD), 13C2 PFH_xDA (FBQW1887Q001), 13C2 PFTeDA (CABS1325S001), 13C2 PFTeDA (FBQW1887Q001), 13C2 PFUnA (FBQW1887Q001), 13C3 HFPO-DA (FBQW1887Q001), 13C3 PFBS (FBQW1887Q001), 13C4 PFBA (FBQW1887Q001), 13C4 PFHpA (FBQW1887Q001), 13C4 PFOA (FBQW1887Q001), 13C4 PFOS (FBQW1887Q001), 13C5 PFNA (FBQW1887Q001), 13C5 PFPeA (FBQW1887Q001), 13C-6:2 FTCA (CABS1324S001), 13C-6:2 FTCA (CABS1324S002), 13C-6:2 FTCA (CABS1325S001), 13C-6:2 FTCA (CABS1325S002), 13C-6:2 FTCA (CABS1325S002MS), 13C-6:2 FTCA (CABS1325S002SD), 13C-6:2 FTCA (FBQW1887Q001), 13C-6:2 FTCA (LCS 320-635791/2-A), 13C-6:2 FTCA (MB 320-635791/1-A), 13C8 FOSA (FBQW1887Q001), 13C-8:2 FTCA (CABS1324S001), 13C-8:2 FTCA (CABS1324S002), 13C-8:2 FTCA (CABS1325S001), 13C-8:2 FTCA (CABS1325S002), 13C-8:2 FTCA (CABS1325S002MS), 13C-8:2 FTCA (CABS1325S002SD), 13C-8:2 FTCA (FBQW1887Q001), 13C-8:2 FTCA (LCS 320-635791/2-A), 13C-8:2 FTCA (MB 320-635791/1-A), 18O2 PFH_xS (FBQW1887Q001), d3-NMeFOSAA (FBQW1887Q001), d5-NMeFOSAA (FBQW1887Q001), d7-N-MeFOSE-M (CABS1325S001), d7-N-MeFOSE-M (FBQW1887Q001), d9-N-EtFOSE-M (CABS1325S001), d9-N-EtFOSE-M (FBQW1887Q001), d-N-EtFOSA-M (FBQW1887Q001), d-N-MeFOSA-M (FBQW1887Q001).

Tuning and Mass Calibration: Tuning and Mass Calibration were not examined by AutoDV.

Internal Standard Area/Retention Time: Internal Standard Area/Retention Time was not examined by AutoDV.

Initial Calibration: Initial Calibration was not examined by AutoDV.

Continuing Calibration: Continuing Calibration was not examined by AutoDV.

Holding Time: These NativeIDs exceeded holding time: CABS1324S001, CABS1324S002, CABS1325S001, CABS1325S002. VDMS4.59

Data Package Completeness Package was complete for level V validation

Forms Review/ Items of Interest

These NativeIDs had dilutions or re-extractions that were flagged Exclude: CABS1324S001, CABS1324S002, CABS1325S001, CABS1325S002, FBQW1887Q001.

COC Review

No discrepancies were noted

Final Data Flags*

*When the data evaluation process results in multiple flags, the most severe flag becomes the final data flag. All flags are from the site-specific QAPP, except the "exclude" flag that is used to designate results that are not for risk assessment (for example, a result from a dilution where the original undiluted result is appropriate).

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: CABS1324S001								
102FTSA	0.036	U	U	0.036	0.19		ug/Kg	
11CLPF3OUDSA	0.029	U	U	0.029	0.19		ug/Kg	
3:3 FTCA	0.038	U	U	0.038	0.19		ug/Kg	
42FTSA	0.048	U	U	0.048	0.19		ug/Kg	
5:3 FTCA	0.036	U	U *+	0.036	0.19		ug/Kg	LCS>UCL (none)
	0.036	U	U *+	0.036	0.19		ug/Kg	InvalidLabFlag (U)
	0.16	Exclude	U H	0.16	0.84		ug/Kg	RE (Exclude)
	0.16	Exclude	U H	0.16	0.84		ug/Kg	HTp>UCL (R)
	0.16	Exclude	U H	0.16	0.84		ug/Kg	InvalidLabFlag (U)
62FTSA	0.025	UJ	U	0.025	0.28		ug/Kg	Sur<LCL (UJ)
7:3 FTCA	0.038	UJ	U *+	0.038	0.19		ug/Kg	Sur<LCL (UJ)
	0.17	Exclude	U H	0.17	0.84		ug/Kg	RE (Exclude)
	0.038	UJ	U *+	0.038	0.19		ug/Kg	LCS>UCL (none)
	0.17	Exclude	U H	0.17	0.84		ug/Kg	HTp>UCL (R)
82FTSA	0.033	U	U	0.033	0.19		ug/Kg	
9CLPF3ONSA	0.033	U	U	0.033	0.19		ug/Kg	
ADONA	0.036	U	U	0.036	0.19		ug/Kg	
HFPODA	0.038	U	U	0.038	0.19		ug/Kg	
NETFOSA	0.044	U	U	0.044	0.19		ug/Kg	
NETFOSAA	0.045	U	U	0.045	0.19		ug/Kg	
NETFOSE	0.026	U	U	0.026	0.19		ug/Kg	
NFDHA	0.037	U	U	0.037	0.19		ug/Kg	
NMEFOSA	0.046	U	U	0.046	0.19		ug/Kg	
NMEFOSAA	0.021	U	U	0.021	0.19		ug/Kg	
NMEFOSE	0.044	U	U	0.044	0.19		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.043	U	U	0.043	0.28		ug/Kg	
Perfluorodecanesulfonic acid (PFDS)	0.049	U	U	0.049	0.19		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.045	U	U	0.045	0.19		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.046	U	U	0.046	0.19		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.027	U	U	0.027	0.19		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.029	U	U	0.029	0.19		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.062	U	U	0.062	0.19		ug/Kg	
Perfluorononanesulfonic acid (PFNS)	0.027	U	U	0.027	0.19		ug/Kg	
Perfluorononanoic acid (PFNA)	0.021	U	U	0.021	0.19		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.031	U	U	0.031	0.19		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.044	J	J	0.04	0.28		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.05	J	J	0.05	0.28		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.035	U	U	0.035	0.19		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.038	U	U	0.038	0.19		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.035	U	U	0.035	0.19		ug/Kg	
Perfluorotridecanoic acid (PFTrDA)	0.02	U	U	0.02	0.19		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.039	U	U	0.039	0.19		ug/Kg	
PFEESA	0.03	U	U	0.03	0.19		ug/Kg	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: CABS1324S001								
PFMBA	0.042	U	U	0.042	0.19		ug/Kg	
PFMPA	0.022	U	U	0.022	0.19		ug/Kg	
Field ID: CABS1324S002								
102FTSA	0.035	U	U	0.035	0.18		ug/Kg	
11CLPF3OUDSA	0.028	U	U	0.028	0.18		ug/Kg	
3:3 FTCA	0.037	U	U	0.037	0.18		ug/Kg	
42FTSA	0.047	U	U	0.047	0.18		ug/Kg	
5:3 FTCA	0.035	U	U *+	0.035	0.18		ug/Kg	LCS>UCL (none)
	0.035	U	U *+	0.035	0.18		ug/Kg	InvalidLabFlag (U)
	0.16	Exclude	U H	0.16	0.83		ug/Kg	RE (Exclude)
	0.16	Exclude	U H	0.16	0.83		ug/Kg	HTp>UCL (R)
	0.16	Exclude	U H	0.16	0.83		ug/Kg	InvalidLabFlag (U)
62FTSA	0.025	R	U	0.025	0.27		ug/Kg	Sur<LCL (R)
7:3 FTCA	0.17	Exclude	U H	0.17	0.83		ug/Kg	RE (Exclude)
	0.17	Exclude	U H	0.17	0.83		ug/Kg	HTp>UCL (R)
	0.037	UJ	U *+	0.037	0.18		ug/Kg	Sur<LCL (UJ)
	0.037	UJ	U *+	0.037	0.18		ug/Kg	LCS>UCL (none)
82FTSA	0.032	U	U	0.032	0.18		ug/Kg	
9CLPF3ONSA	0.032	U	U	0.032	0.18		ug/Kg	
ADONA	0.036	U	U	0.036	0.18		ug/Kg	
HFPODA	0.037	U	U	0.037	0.18		ug/Kg	
NETFOSA	0.043	U	U	0.043	0.18		ug/Kg	
NETFOSAA	0.044	U	U	0.044	0.18		ug/Kg	
NETFOSE	0.026	U	U	0.026	0.18		ug/Kg	
NFDHA	0.037	U	U	0.037	0.18		ug/Kg	
NMEFOSA	0.045	U	U	0.045	0.18		ug/Kg	
NMEFOSAA	0.021	U	U	0.021	0.18		ug/Kg	
NMEFOSE	0.043	U	U	0.043	0.18		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.035	U	U	0.035	0.18		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.042	U	U	0.042	0.27		ug/Kg	
Perfluorodecanesulfonic acid (PFDS)	0.048	U	U	0.048	0.18		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.044	U	U	0.044	0.18		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.027	U	U	0.027	0.18		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.045	U	U	0.045	0.18		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.035	U	U	0.035	0.18		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.027	U	U	0.027	0.18		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.028	U	U	0.028	0.18		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.035	U	U	0.035	0.18		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.06	U	U	0.06	0.18		ug/Kg	
Perfluorononanesulfonic acid (PFNS)	0.027	U	U	0.027	0.18		ug/Kg	
Perfluorononanoic acid (PFNA)	0.02	U	U	0.02	0.18		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.03	U	U	0.03	0.18		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.039	U	U	0.039	0.27		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.048	U	U	0.048	0.27		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.034	U	U	0.034	0.18		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.037	U	U	0.037	0.18		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.034	U	U	0.034	0.18		ug/Kg	
Perfluorotridecanoic acid (PFTTrDA)	0.019	U	U	0.019	0.18		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.038	U	U	0.038	0.18		ug/Kg	
PFEESA	0.029	U	U	0.029	0.18		ug/Kg	
PFMBA	0.041	U	U	0.041	0.18		ug/Kg	
PFMPA	0.022	U	U	0.022	0.18		ug/Kg	

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: CABS1325S001								
102FTSA	0.037	U	U	0.037	0.19		ug/Kg	
11CLPF3OUDSA	0.03	UJ	U	0.03	0.19		ug/Kg	Sur<LCL (UJ)
3:3 FTCA	0.04	U	U	0.04	0.19		ug/Kg	
42FTSA	0.049	U	U	0.049	0.19		ug/Kg	
5:3 FTCA	0.037	U	U *+	0.037	0.19		ug/Kg	LCS>UCL (none)
	0.037	U	U *+	0.037	0.19		ug/Kg	InvalidLabFlag (U)
	0.15	Exclude	U H	0.15	0.77		ug/Kg	RE (Exclude)
	0.15	Exclude	U H	0.15	0.77		ug/Kg	HTp>UCL (R)
	0.15	Exclude	U H	0.15	0.77		ug/Kg	InvalidLabFlag (U)
62FTSA	0.026	R	U	0.026	0.29		ug/Kg	Sur<LCL (R)
7:3 FTCA	0.16	Exclude	U H	0.16	0.77		ug/Kg	HTp>UCL (R)
	0.04	UJ	U *+	0.04	0.19		ug/Kg	LCS>UCL (none)
	0.04	UJ	U *+	0.04	0.19		ug/Kg	Sur<LCL (UJ)
	0.16	Exclude	U H	0.16	0.77		ug/Kg	RE (Exclude)
82FTSA	0.034	U	U	0.034	0.19		ug/Kg	
9CLPF3ONSA	0.034	UJ	U	0.034	0.19		ug/Kg	Sur<LCL (UJ)
ADONA	0.038	U	U	0.038	0.19		ug/Kg	
HFPODA	0.04	U	U	0.04	0.19		ug/Kg	
NETFOSA	0.045	U	U	0.045	0.19		ug/Kg	
NETFOSAA	0.046	U	U	0.046	0.19		ug/Kg	
NETFOSE	0.027	UJ	U	0.027	0.19		ug/Kg	Sur<LCL (UJ)
NFDHA	0.039	U	U	0.039	0.19		ug/Kg	
NMEFOSA	0.047	U	U	0.047	0.19		ug/Kg	
NMEFOSAA	0.022	U	U	0.022	0.19		ug/Kg	
NMEFOSE	0.045	UJ	U	0.045	0.19		ug/Kg	Sur<LCL (UJ)
Perfluorobutanesulfonic acid (PFBS)	0.037	U	U	0.037	0.19		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.044	U	U	0.044	0.29		ug/Kg	
Perfluorodecanesulfonic acid (PFDS)	0.05	U	U	0.05	0.19		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.046	U	U	0.046	0.19		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.029	U	U	0.029	0.19		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.047	U	U	0.047	0.19		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.037	U	U	0.037	0.19		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.032	J	J	0.03	0.19		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.037	UJ	U	0.037	0.19		ug/Kg	Sur<LCL (UJ)
Perfluoro-n-octadecanoic acid (PFODA)	0.064	UJ	U	0.064	0.19		ug/Kg	Sur<LCL (UJ)
Perfluorononanesulfonic acid (PFNS)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluorononanoic acid (PFNA)	0.021	U	U	0.021	0.19		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.032	U	U	0.032	0.19		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.042	U	U	0.042	0.29		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.051	U	U	0.051	0.29		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.04	U	U	0.04	0.19		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.036	UJ	U	0.036	0.19		ug/Kg	Sur<LCL (UJ)
Perfluorotridecanoic acid (PFTTrDA)	0.02	U	U	0.02	0.19		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.041	U	U	0.041	0.19		ug/Kg	
PFEESA	0.031	U	U	0.031	0.19		ug/Kg	
PFMBA	0.044	U	U	0.044	0.19		ug/Kg	
PFMPA	0.023	U	U	0.023	0.19		ug/Kg	
Field ID: CABS1325S002								
102FTSA	0.037	U	U	0.037	0.19		ug/Kg	
11CLPF3OUDSA	0.03	UJ	U	0.03	0.19		ug/Kg	Sur<LCL (UJ)

Validated Form I

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: CABS1325S002								
3:3 FTCA	0.039	U	U	0.039	0.19		ug/Kg	
42FTSA	0.049	U	U	0.049	0.19		ug/Kg	
5:3 FTCA	0.037	U	U *+ F1	0.037	0.19		ug/Kg	LCS>UCL (none)
	0.037	U	U *+ F1	0.037	0.19		ug/Kg	MS>UCL (none)
	0.037	U	U *+ F1	0.037	0.19		ug/Kg	SD>UCL (none)
	0.037	U	U *+ F1	0.037	0.19		ug/Kg	InvalidLabFlag (U)
	0.14	Exclude	U H	0.14	0.76		ug/Kg	RE (Exclude)
	0.14	Exclude	U H	0.14	0.76		ug/Kg	HTp>UCL (R)
	0.14	Exclude	U H	0.14	0.76		ug/Kg	InvalidLabFlag (U)
62FTSA	0.026	UJ	U	0.026	0.29		ug/Kg	Sur<LCL (UJ)
7:3 FTCA	0.039	UJ	U *+ F1	0.039	0.19		ug/Kg	SD>UCL (none)
	0.16	Exclude	U H	0.16	0.76		ug/Kg	HTp>UCL (R)
	0.039	UJ	U *+ F1	0.039	0.19		ug/Kg	Sur<LCL (UJ)
	0.039	UJ	U *+ F1	0.039	0.19		ug/Kg	MS>UCL (none)
	0.039	UJ	U *+ F1	0.039	0.19		ug/Kg	LCS>UCL (none)
	0.16	Exclude	U H	0.16	0.76		ug/Kg	RE (Exclude)
82FTSA	0.034	U	U	0.034	0.19		ug/Kg	
9CLPF3ONSA	0.034	UJ	U	0.034	0.19		ug/Kg	Sur<LCL (UJ)
ADONA	0.038	U	U	0.038	0.19		ug/Kg	
HFPODA	0.039	U	U	0.039	0.19		ug/Kg	
NETFOSA	0.045	U	U	0.045	0.19		ug/Kg	
NETFOSAA	0.046	U	U	0.046	0.19		ug/Kg	
NETFOSE	0.027	U	U	0.027	0.19		ug/Kg	
NFDHA	0.039	U	U	0.039	0.19		ug/Kg	
NMEFOSA	0.047	U	U	0.047	0.19		ug/Kg	
NMEFOSAA	0.022	U	U	0.022	0.19		ug/Kg	
NMEFOSE	0.045	U	U	0.045	0.19		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.037	U	U	0.037	0.19		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.044	U	U	0.044	0.29		ug/Kg	
Perfluorodecanesulfonic acid (PFDS)	0.05	U	U	0.05	0.19		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.046	U	U	0.046	0.19		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.029	U	U	0.029	0.19		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.047	U	U	0.047	0.19		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.037	U	U	0.037	0.19		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.03	U	U	0.03	0.19		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.037	UJ	U	0.037	0.19		ug/Kg	Sur<LCL (UJ)
Perfluoro-n-octadecanoic acid (PFODA)	0.064	UJ	U	0.064	0.19		ug/Kg	Sur<LCL (UJ)
Perfluorononanesulfonic acid (PFNS)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluorononanoic acid (PFNA)	0.021	U	U	0.021	0.19		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.032	U	U	0.032	0.19		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.041	U	U	0.041	0.29		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.051	U	U	0.051	0.29		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.039	U	U	0.039	0.19		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluorotridecanoic acid (PFTTrDA)	0.02	U	U	0.02	0.19		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.04	U	U	0.04	0.19		ug/Kg	
PFEESA	0.031	U	U	0.031	0.19		ug/Kg	
PFMBA	0.043	U	U	0.043	0.19		ug/Kg	
PFMPA	0.023	U	U	0.023	0.19		ug/Kg	

Validation Flag Abbreviations

<i>Abbreviation</i>	<i>Validation Reason</i>	<i>Category</i>
HTp>UCL	Holding time exceeded	HoldingTime
LCS>UCL	LCS recovery greater than the upper control limit	LaboratoryControlSample
MS>UCL	Matrix spike recovery greater than the upper control limit	Matrix
SD>UCL	Matrix spike duplicate recovery criteria greater than the upper control limit	Matrix
InvalidLabFlag	Removed invalid laboratory flag	Miscellaneous
RE	Re-extraction and/or re-analysis	Re-analysis
Sur<LCL	Surrogate recovery less than the lower control limit	SurrogateRecovery

NASA SSFL CJ063 PFAS PO 148024177

Data Quality Evaluation

SDG: 570-117720-1

Validator/Date:

mfesler

1/9/2023

Method: E537M

Reviewer/Date:

mfesler

1/10/2023

Matrix: SOIL

Field Samples

Field blank association lot values: LotNumber / FieldID / SDG

NativeID	QAQC Type	Dilution	EB Lot	TB Lot	AB Lot
SOIL					
DABS1284S001	N	1	07112201 / EBQW2809Q001 / 570-116845-1		
DABS1284S001MS	MS	1			
DABS1284S001SD	SD	1			

Associated Field Blanks (other SDGs)

NativeID	QAQC Type	Dilution	EB Lot	TB Lot	AB Lot
WATER					
EBQW2809Q001	EB	1	07112201 / EBQW2809Q001 / 570-116845-1		
EBQW2813Q001	EB	1	07112201 / EBQW2809Q001 / 570-116845-1		

1. Case Narrative / Items of Interest

The following items were noted: MS<LCL; SD<LCL

2. Blank Summary

Field Blanks

No Field Blank detects were found.

Method Blanks

No Method Blank detects were found.

3. Spikes and Duplicates

Field Duplicate

No FD Associated.

Laboratory Duplicates

None in this SDG

Matrix Spike

These MS's were out of control: 3:3 FTCA (MS - DABS1284S001MS), 5:3 FTCA (MS - DABS1284S001MS), 7:3 FTCA (MS - DABS1284S001MS). These SD's were out of control: 3:3 FTCA (SD - DABS1284S001SD), 5:3 FTCA (SD - DABS1284S001SD). These MS/SD RPD's were out of control: Perfluoro-n-octadecanoic acid (PFODA) (DABS1284S001).

Matrix / Analyte	Sample ID	LR Type	Result	Qualifier	Reason
SOIL	3:3 FTCA				

SOIL	<u>3:3 FTCA</u>				
	DABS1284S001	0.04 ug/Kg	UJ	MS<LCL	
	DABS1284S001	0.04 ug/Kg	UJ	SD<LCL	
SOIL	<u>5:3 FTCA</u>				
	DABS1284S001	0.037 ug/Kg	none	MS>UCL	
	DABS1284S001	0.037 ug/Kg	none	SD>UCL	
SOIL	<u>7:3 FTCA</u>				
	DABS1284S001	0.04 ug/Kg	none	MS>UCL	
SOIL	<u>Perfluoro-n-octadecanoic acid (PFODA)</u>				
	DABS1284S001	0.064 ug/Kg	none	MSRPD	

4. Laboratory Control Sample

All acceptance criteria were met. No spike dupes in this SDG.

5. Surrogates

These surrogates were out of control: 13C4 PFBA (DABS1284S001SD), 13C-6:2 FTCA (DABS1284S001MS), 13C-6:2 FTCA (DABS1284S001SD). Associated with QC samples only; no flagging applied.

<u>Field ID</u>	<u>LabsampleID</u>	<u>LowerLimit</u>	<u>UpperLimit</u>	<u>Result</u>	<u>Surrogate</u>
DABS1284S001MS	570-117720-1	50	150	49	13C-6:2 FTCA
DABS1284S001SD	570-117720-1	50	150	48	13C4 PFBA
DABS1284S001SD	570-117720-1	50	150	47	13C-6:2 FTCA

6. Tuning and Mass Calibration

Tuning and Mass Calibration were not examined by AutoDV.

7. Internal Standard

Internal Standard Area/Retention Time was not examined by AutoDV.

8. Calibration Information

Initial Calibration

Initial Calibration was not examined by AutoDV.

Continuing Calibration

Continuing Calibration was not examined by AutoDV.

9. Holding Time

All acceptance criteria were met.

10. Confirmation

None for this SDG.

11. Summary

General Comments

Field Duplicates: No FD Associated.

Form I Review: No samples were excluded for dilutions or re-extractions.

Surrogates: These surrogates were out of control: 13C4 PFBA (DABS1284S001SD), 13C-6:2 FTCA (DABS1284S001MS), 13C-6:2 FTCA (DABS1284S001SD).

Tuning and Mass Calibration: Tuning and Mass Calibration were not examined by AutoDV.

Internal Standard Area/Retention Time: Internal Standard Area/Retention Time was not examined by AutoDV.

Initial Calibration: Initial Calibration was not examined by AutoDV.

Continuing Calibration: Continuing Calibration was not examined by AutoDV.

Matrix Spike: These MS's were out of control: 3:3 FTCA (MS - DABS1284S001MS), 5:3 FTCA (MS - DABS1284S001MS), 7:3 FTCA (MS - DABS1284S001MS). These SD's were out of control: 3:3 FTCA (SD - DABS1284S001SD), 5:3 FTCA (SD - DABS1284S001SD). These MS/SD RPD's were out of control: Perfluoro-n-octadecanoic acid (PFODA) (DABS1284S001).

VDMS4.59

Data Package Completeness Package was complete for level V validation

Forms Review/ Items of Interest

No samples were excluded for dilutions or re-extractions.

COC Review

No discrepancies were noted

Final Data Flags*

*When the data evaluation process results in multiple flags, the most severe flag becomes the final data flag. All flags are from the site-specific QAPP, except the "exclude" flag that is used to designate results that are not for risk assessment (for example, a result from a dilution where the original undiluted result is appropriate).

Analyte	Result	Final Flag	Lab Flag	MDL	RL	LOD	Units	Validation Reason (Flag)
Field ID: DABS1284S001								
102FTSA	0.037	U	U	0.037	0.19		ug/Kg	
11CLPF3OUDSA	0.03	U	U	0.03	0.19		ug/Kg	
3:3 FTCA	0.04	UJ	U F1	0.04	0.19		ug/Kg	MS<LCL (UJ)
	0.04	UJ	U F1	0.04	0.19		ug/Kg	SD<LCL (UJ)
42FTSA	0.049	U	U	0.049	0.19		ug/Kg	
5:3 FTCA	0.037	U	U F1	0.037	0.19		ug/Kg	MS>UCL (none)
	0.037	U	U F1	0.037	0.19		ug/Kg	SD>UCL (none)
	0.037	U	U F1	0.037	0.19		ug/Kg	InvalidLabFlag (U)
62FTSA	0.026	U	U	0.026	0.29		ug/Kg	
7:3 FTCA	0.04	U	U F1	0.04	0.19		ug/Kg	InvalidLabFlag (U)
	0.04	U	U F1	0.04	0.19		ug/Kg	MS>UCL (none)
82FTSA	0.034	U	U	0.034	0.19		ug/Kg	
9CLPF3ONSA	0.034	U	U	0.034	0.19		ug/Kg	
ADONA	0.038	U	U	0.038	0.19		ug/Kg	
HFPODA	0.04	U	U	0.04	0.19		ug/Kg	
NETFOSA	0.045	U	U	0.045	0.19		ug/Kg	
NETFOSAA	0.046	U	U	0.046	0.19		ug/Kg	
NETFOSE	0.027	U	U	0.027	0.19		ug/Kg	
NFDHA	0.039	U	U	0.039	0.19		ug/Kg	
NMEFOSA	0.047	U	U	0.047	0.19		ug/Kg	
NMEFOSAA	0.022	U	U	0.022	0.19		ug/Kg	
NMEFOSE	0.045	U	U	0.045	0.19		ug/Kg	
Perfluorobutanesulfonic acid (PFBS)	0.037	U	U	0.037	0.19		ug/Kg	
Perfluorobutanoic acid (PFBA)	0.044	U	U	0.044	0.29		ug/Kg	
Perfluorodecanesulfonic acid (PFDS)	0.05	U	U	0.05	0.19		ug/Kg	
Perfluorodecanoic acid (PFDA)	0.046	U	U	0.046	0.19		ug/Kg	
Perfluorododecanoic acid (PFDoA)	0.029	U	U	0.029	0.19		ug/Kg	
Perfluoroheptanesulfonic acid (PFHpS)	0.047	U	U	0.047	0.19		ug/Kg	
Perfluoroheptanoic acid (PFHpA)	0.037	U	U	0.037	0.19		ug/Kg	
Perfluorohexanesulfonic acid (PFHxS)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluorohexanoic acid (PFHxA)	0.03	U	U	0.03	0.19		ug/Kg	
Perfluoro-n-hexadecanoic acid (PFHxDA)	0.037	U	U	0.037	0.19		ug/Kg	
Perfluoro-n-octadecanoic acid (PFODA)	0.064	U	U	0.064	0.19		ug/Kg	MSRPD (none)
Perfluorononanesulfonic acid (PFNS)	0.028	U	U	0.028	0.19		ug/Kg	
Perfluorononanoic acid (PFNA)	0.021	U	U	0.021	0.19		ug/Kg	
Perfluorooctanesulfonamide (FOSA)	0.032	U	U	0.032	0.19		ug/Kg	
Perfluorooctanesulfonic acid (PFOS)	0.042	U	U	0.042	0.29		ug/Kg	
Perfluorooctanoic acid (PFOA)	0.054	J	J	0.051	0.29		ug/Kg	
Perfluoropentanesulfonic acid (PFPeS)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluoropentanoic acid (PFPeA)	0.04	U	U	0.04	0.19		ug/Kg	
Perfluorotetradecanoic acid (PFTeA)	0.036	U	U	0.036	0.19		ug/Kg	
Perfluorotridecanoic acid (PFTTrDA)	0.02	U	U	0.02	0.19		ug/Kg	
Perfluoroundecanoic acid (PFUnA)	0.041	U	U	0.041	0.19		ug/Kg	
PFEESA	0.031	U	U	0.031	0.19		ug/Kg	
PFMBA	0.044	U	U	0.044	0.19		ug/Kg	
PFMPA	0.023	U	U	0.023	0.19		ug/Kg	

Validation Flag Abbreviations

<i>Abbreviation</i>	<i>Validation Reason</i>	<i>Category</i>
MS<LCL	Matrix spike recovery less than the lower control limit	Matrix
MS>UCL	Matrix spike recovery greater than the upper control limit	Matrix
MSRPD	Matrix spike RPD criteria exceedance	Matrix
SD<LCL	Matrix spike duplicate recovery criteria less than the lower control limit	Matrix
SD>UCL	Matrix spike duplicate recovery criteria greater than the upper control limit	Matrix
InvalidLabFlag	Removed invalid laboratory flag	Miscellaneous

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