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DATA REPORT

Former Fire Training Pit

SNOHOMISH COUNTY AIRPORT, EVERETT, WASHINGTON

Submitted To: Snohomish County Airport
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Attn: Mr. Andrew Rardin

Subject: DATA REPORT, FORMER FIRE TRAINING PIT, SNOHOMISH COUNTY
AIRPORT, EVERETT, WASHINGTON

Shannon & Wilson prepared this report and participated in this project as a consultant to Snohomish County Public Works under our on-call contract for geotechnical and environmental services (Agreement No. OCC19/1-7.8[BG]). Our scope of services was specified in Task No. TA 5, approved on April 20, 2022.

This report summarizes results of soil and groundwater analyses for per- and polyfluoroalkyl substances (PFAS) at the former Fire Training Pit at the Snohomish County Airport, also known as Paine Field, in Everett, Washington.

We appreciate the opportunity to be of service to you on this project. If you have questions concerning this report, or we may be of further service, please contact us.

Sincerely,

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EXECUTIVE SUMMARY

The purpose of this Data Report is to continue the investigation that began in 2018 (by others) to identify the concentrations of per- and polyfluoroalkyl substances (PFAS) in soil and groundwater in proximity to the former Fire Training Pit (FTP) at Snohomish County Airport (SCA) in Everett, Washington.

The FTP is adjacent to a taxilane on the SCA property. The area of the FTP and the taxilane are secured and not accessible to the public. SCA is zoned as light industrial and will remain in that category for the foreseeable future.

In 2006, the FTP was excavated and backfilled as part of an action to remove petroleum-contaminated soil. The FTP is currently level with the surrounding grade in a grassy field adjacent to Taxilane K-6.

A Beneficial Water User Survey was conducted as part of this report to better understand the potential of off-site drinking water exposure from the FTP. No active groundwater rights or active water supply wells within one mile of the FTP were found which significantly limits potential human receptor pathways.

Field explorations were conducted during May 2022 to March 2023 to collect information to support this Data Report, including collection and analysis of soil and groundwater samples and measurement of groundwater levels.

Soil

- Soil samples were collected from 16 borings on the SCA property at depths from 0.2 to 11.6 feet below ground surface (bgs), except one soil sample collected from 105 feet bgs at boring FP-MW4.
- Concentrations of PFAS were detected in each soil sample, except for the 105-foot sample from boring FP-MW4, suggesting that concentrations of PFAS are distributed throughout the fill soil and weathered Vashon Till (Qvt) at the sample locations.
- Samples collected near the FTP generally had higher concentrations of PFAS than locations farther away, suggesting that the historical use of aqueous film forming foam (AFFF) at the FTP is the primary release mechanism for PFAS in the vicinity.
- Typically, perfluorooctanesulfonic acid (PFOS) followed by perfluorohexanesulfonic acid (PFHxS) were the analytes with the highest concentrations in each sample. The concentration of PFOS was generally one order of magnitude higher than PFHxS. The relative concentrations of PFAS analytes in samples are consistent with a historical release of AFFF.

Groundwater

- Based on measurements from groundwater monitoring wells, shallow groundwater is perched on the competent Qvt unit, and the flow gradient is generally westwards at the FTP. The depth of groundwater at the FTP was approximately 14 feet to 20 feet bgs throughout the monitoring period (June 2022 to March 2023).
- Fifteen (15) groundwater samples were collected from 5 monitoring wells and 4 temporary sampling points. Concentrations of PFAS were detected in each groundwater sample.
- Samples collected near the FTP and downgradient generally had higher concentrations of PFAS than locations crossgradient or upgradient from the FTP, suggesting that the historical use of AFFF at the FTP is the primary release mechanism for PFAS in the vicinity.
- Typically, PFOS was the analyte with the highest concentration in each sample. The relative concentrations of PFAS analytes in samples are consistent with a historical release of AFFF.

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ACRONYMS	µg/kg	microgram per kilogram
	AFFF	aqueous film forming foam
	bgs	below ground surface
	CUL	cleanup level
	Ecology	Washington State Department of Ecology
	EPA	U.S. Environmental Protection Agency
	FTP	Fire Training Pit
	NAVD88	North American Vertical Datum of 1988
	ng/L	nanogram per liter
	PFAS	per- and polyfluoroalkyl substances
	PFHxS	perfluorohexanesulfonic acid
	PFOS	perfluorooctanesulfonic acid
	Qu	undifferentiated sediments
	Qtb	transitional beds
	Qva	Vashon Advance Outwash
	Qvt	Vashon Till
	SCA	Snohomish County Airport
	TPH	total petroleum hydrocarbons
	TPH-D	total petroleum hydrocarbons as diesel-range
	TPH-O	total petroleum hydrocarbons as heavy oil-range
	USGS	U.S. Geological Survey
	WAC	Washington Administrative Code

1 INTRODUCTION

This Data Report summarizes results of soil and groundwater analyses for per- and polyfluoroalkyl substances (PFAS) related to the historical use of AFFF at the former Fire Training Pit (FTP) at the Snohomish County Airport (SCA), also known as Paine Field, in Everett, Washington. A vicinity map is provided as Figure 1.

1.1 Site Description

SCA is located at 3220 100th Street SW in Everett, Washington. The FTP is adjacent to the northwest boundary of Taxilane K-6 (formerly K-5) at SCA (Figure 2). The FTP was an approximately 40 feet by 80 feet oval earthen depression about 1 to 2 feet deep (CDM, 2007). There is no evidence that a liner was present in the earthen depression. An aerial photo from 1990 is shown below in Exhibit 1-1.

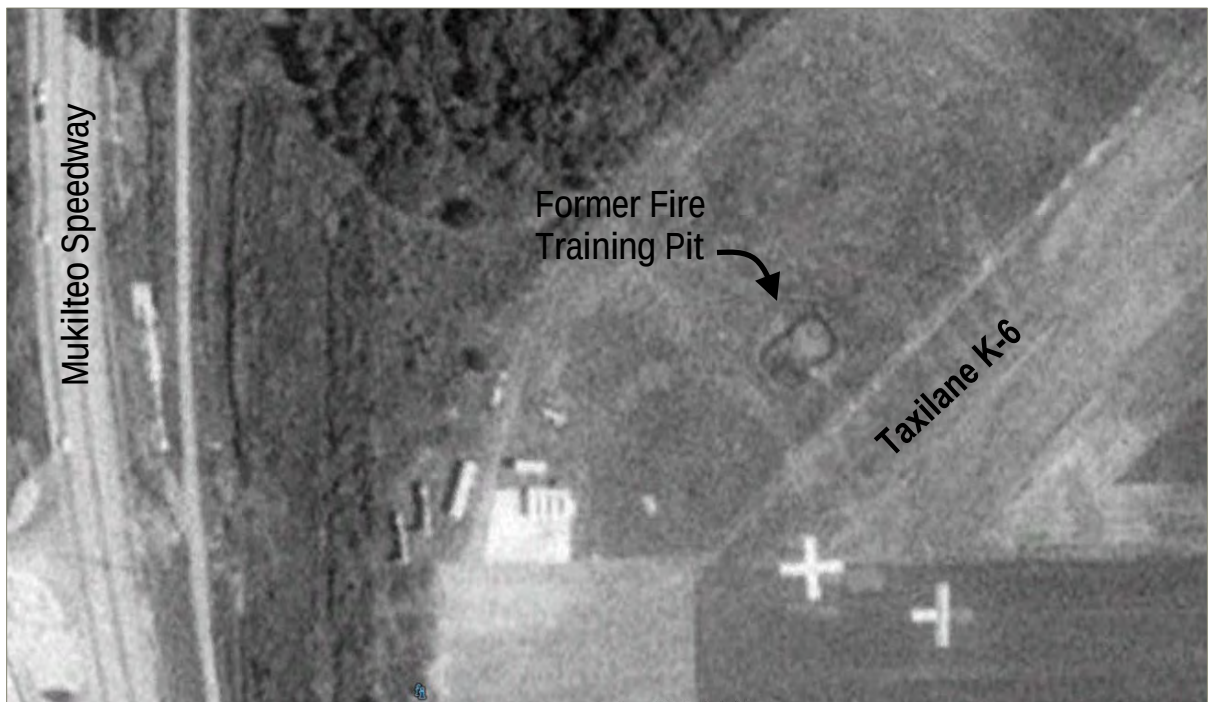


Exhibit 1-1: Aerial Photo of the Former Fire Training Pit in 1990 (North is Up)
Source: Google Earth Image Dated 7/9/1990

The FTP was used by the SCA Fire Department, Boeing Fire Department, Snohomish County District 1 and 11 Fire Departments, and potentially other fire departments to support fire training activities (CDM Smith, 2018). Reportedly, during training activities,

petroleum and potentially other flammable liquids were placed in the FTP and ignited. AFFF that contained PFAS was sprayed to extinguish the fire.

The FTP was excavated and backfilled in 2006 as part of a remedial excavation to remove petroleum-contaminated soil from the FTP. The remedial excavation is discussed in Section 1.3.1.

The FTP is currently level with the surrounding grade in a grassy field adjacent to Taxiway K-6. The area of the former FTP and proximity are owned by Snohomish County and used for industrial purposes, including aircraft movement and maintenance. The tax parcels at the FTP are zoned for light industrial use. The SCA property is fenced and locked, and access is highly controlled by the airport in accordance with federal regulations. Access by the public to areas relevant to this report is prohibited. An aerial photo from 2022 is shown below in Exhibit 1-2.



Exhibit 1-2: Aerial Photo of the Former Fire Training Pit in 2022 (North is Up)

Source: Google Earth Image Dated 7/30/2022

A stormwater detention pond is located on the SCA property approximately 550 feet to the west of the FTP and at the base of an approximately 50-foot downslope. Stormwater runoff from the taxiway that is adjacent to the FTP, and stormwater runoff from the grassy field adjacent to the FTP, is collected in catch basins and piped to the detention pond. A map of stormwater conveyance is provided as Figure 3.

Two stormwater pipe outfalls are visible in the slope face above the detention pond. The north stormwater outfall discharges water into a plastic half-pipe that runs to the elevation

of the detention pond. The south stormwater outfall discharges water to the slope face, which is armored with rock riprap down to the elevation of the detention pond. The detention pond has an outlet pipe that directs water off the SCA property, under Mukilteo Speedway, and discharges to Big Gulch Creek. Big Gulch Creek connects with the Puget Sound approximately two miles downstream to the northwest.

Groundwater seeps have been observed on the slope face above the detention pond, which is hydraulically downgradient from the FTP.

The SCA property boundary is approximately 600 feet downgradient (west) of the FTP. The area immediately outside of the SCA property boundary is used by the public and includes a highway (Mukilteo Speedway), retail buildings, and residences.

1.2 Regulatory Framework

PFAS compounds are a group of human-made fluorinated organic chemicals that have been used since the 1950s. The compounds, which repel oil and water, have been used in various products, including carpet and clothing treatments, coatings for paper and cardboard, nonstick cookware, waterproof clothing membranes, wire casing, tubing, plumbing thread seal tape, and within AFFF used to extinguish liquid hydrocarbon fires (U.S. Environmental Protection Agency [EPA], 2017).

The PFAS family consists of thousands of chemicals. Many of these chemicals can continue to degrade in the environment until they reach end products known as perfluoroalkyl acids which are resistant to further degradation (Washington State Department of Ecology [Ecology], 2022).

As of October 2021, Ecology has determined PFAS are a hazardous substance under the Model Toxics Control Act (MTCA) because PFAS meets the definition of a persistent compound under Washington's dangerous waste criteria.

Federal and state regulations regarding PFAS are rapidly evolving due to new research.

1.3 Site History

From 1989 to 2006, the FTP was investigated and excavated in response to detections of soil impacted by total petroleum hydrocarbons (TPH) and lead. A No Further Action determination was issued by Ecology following implementation of the excavation remedial action. In 2018, an investigation for PFAS was conducted at the FTP. A summary of findings from historical investigations is provided below.

1.3.1 2006 Removal of Total Petroleum Hydrocarbons and Lead-Impacted Soil

In 1989, surface water within the FTP was sampled and analyzed. Free phase petroleum hydrocarbons were present within the FTP. TPH and metals were detected in the surface water sample. Also, TPH was detected in soil at a 5.5 feet depth collected from a boring in the FTP. Foaming of the sample was observed by the laboratory during preparation of the volatile organic compound analysis. The 1989 sampling activities were reported by Dames & Moore (1989), but the report was not available to us. The information in this paragraph was summarized by CDM Smith (2018).

A subsequent environmental investigation of the FTP was undertaken by AGI Technologies in 1998 (AGI, 1998). Samples of soil, surface water, and groundwater were collected from the FTP. Samples of soil had TPH as diesel-range (TPH-D), TPH as heavy oil-range (TPH-O), and lead detected at concentrations above the contemporary and present-day MTCA Method A cleanup levels (CULs). The AGI 1998 report was not available to us. The information in this paragraph was summarized by CDM Smith (2018).

In 2006, approximately 170 cubic yards of soil was excavated from the FTP to remove TPH- and lead-impacted soil (CDM, 2007). The soil was disposed at Rabanco's Roosevelt Regional Landfill in Roosevelt, Washington. Confirmation soil samples from the excavation indicated that the TPH-D, TPH-O, and lead-impacted soil had been removed to levels below the MTCA Method A CULs at the time. The area was backfilled following the excavation. Ecology issued a No Further Action letter for the FTP (Ecology, 2007). The excavation report is provided as Appendix A.

1.3.2 2018 PFAS Investigation

In 2018, CDM Smith collected soil and groundwater samples at the FTP to evaluate for the presence of PFAS (CDM Smith, 2018). Six borings were completed using direct-push technology. The borings included one location within the footprint of the FTP, four borings completed adjacent to the FTP (located between 40 to 60 feet to the north, east, south, and west), and one boring completed in the inferred downgradient direction (located approximately 200 feet west of the FTP). The 2018 borings are named FP1 through FP6 and are plotted in Figure 2. The 2018 report is provided as Appendix B.

As part of the 2018 investigation, the following samples were collected:

- Soil samples were collected from within the footprint of the FTP (boring FP1) at depths of 4.5 feet below ground surface (bgs), 10 feet bgs, and 16 feet bgs.
- Groundwater samples were collected from within the footprint of the FTP and to the north and east (borings FP1, FP2, and FP3). Groundwater was not encountered within

borings FP4, FP5 and FP6, believed to be due to the investigation taking place during the dry season (mid-August).

Several PFAS compounds were detected in the soil and groundwater samples with PFOS detected at the highest concentrations. PFOS was detected at up to 716 micrograms per kilogram ($\mu\text{g/kg}$) in the 4.5 feet bgs soil sample. PFOS was detected up to 33,300 nanograms per liter (ng/L) in groundwater with the highest concentration detected in the boring placed within the FTP (boring FP1).

The concentrations of PFAS in soil and groundwater detected in 2018 were similar but slightly lower than the concentrations detected in our investigation in 2022 (discussed in Section 4).

1.4 Purpose and Scope of Services

The purpose of this Data Report was to continue the investigation that began in 2018 (by others) to identify the concentrations of PFAS in soil and groundwater in proximity to the former FTP at SCA in Everett, Washington.

Key elements of Shannon & Wilson's scope of services included:

- Drilling for collection of soil samples from borings and for collection of groundwater from temporary sampling points placed within borings,
- Installation of groundwater monitoring wells and sampling of groundwater from monitoring wells,
- Measurement of groundwater levels at monitoring wells,
- Evaluation of beneficial uses of groundwater in the vicinity of the FTP, and
- Preparation of this report.

1.5 Limitations

The findings and conclusions documented in this Data Report have been prepared for specific application to this project and have been developed in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in this area.

Site conditions, both surface and subsurface, may be affected due to natural processes or human influence. This Data Report is based on conditions that existed at the time of the evaluation. Because many aspects of an environmental assessment rely on third-party information and interpretation of limited subsurface data, it is impossible to know with absolute certainty if such a condition exists. Contaminants may be present in areas that

were not surveyed or sampled or may migrate to areas that showed no signs of contamination at the time they were studied. The conclusions presented are based on interpretation of information currently available to us and are made within the operational scope, budget, and schedule constraints of this project. No warranty, express or implied, is made.

Shannon & Wilson has prepared the enclosed, "Important Information About Your Environmental Site Assessment/Evaluation Report," to assist you and others in understanding our report.

2 LOCAL GEOLOGY AND HYDROGEOLOGY

The ground surface in the immediate vicinity of the FTP has an approximate elevation of 566 feet North American Vertical Datum of 1988 (NAVD88), and the surface slopes gently down (approximately 2%) to the west over about 400 feet, to a point where a break in slope occurs (Figure 2). From this point, ground slopes down more steeply (approximately 33%) to the west over a lateral distance of about 150 feet and vertical drop of about 50 feet, to where a stormwater detention pond is present on the SCA property, near the Mukilteo Speedway/State Route 525.

2.1 Site Geology

Geotechnical investigations were performed in 1998 in the FTP vicinity (AGI, 1998). Based on these investigations and additional explorations performed in 2018 by CDM Smith and in 2022 as part of this Data Report, the vicinity of the FTP is underlain by fill soils ranging in thickness from about 12 feet bgs to possibly as much as about 44 feet bgs. Fill soils appears to become thicker to the west of the FTP until reaching the steep downslope prior to the stormwater detention pond. The fill soils are underlain by Vashon Till (Qvt) and Vashon Advance Outwash (Qva). Cross sections are provided in Figures 4 and 5.

The following soil units are interpreted as being present in the FTP vicinity:

- **Upper Fill:** The upper fill soils, noted by CDM Smith to extend between approximately 16 and 24 feet bgs, were interpreted to consist of reworked native glacial till, possibly mixed with construction rubble and pieces of vegetation. CDM Smith described the upper fill to generally consist of very loose to loose, moist to wet, silty sand with some gravel and cobbles and occasional organics and wood.
- **Lower Fill:** The lower fill soils were noted by CDM Smith to extend to depths of approximately 19 to 44 feet bgs. These soils were described as generally consisting of loose to medium dense, saturated, silty sand with some gravel and cobbles, but with fewer organics and wood than in the upper fill.

- **Vashon Till (Qvt):** This native soil, deposited during the most recent local glaciation, was described by CDM Smith as consisting of dense to very dense, moist to wet, silty sand with some gravel and cobbles and occasional lenses of clean sand. CDM Smith noted it was encountered by their explorations immediately below the lower fill.

Weathered (looser) Qvt was observed with a thickness of up to 13 feet underlain by competent (dense/stiff) Qvt. The weathered Qvt has been subglacially reworked, making it not only looser, but also of higher permeability and water content. During direct-push drilling by Shannon & Wilson in 2022, the surface of competent Qvt was subjectively designated as the depth at which refusal was encountered, unless obvious contraindications existed, in accordance with standards of practice. Because distinguishing between weathered and competent till using soil characteristics alone is challenging (they appear very similar in soil samples), the subjective designation further aids to identify the thickness of the weathered Qvt present on top of competent Qvt at boring locations.

Explorations by Shannon & Wilson in 2022 indicate that the surface of the Qvt may slope downwards more steeply than the topographic surface to the west of the FTP, resulting in greater depth of fill soils to the west of the FTP. This trend is interrupted by a steep, apparently human-made, topographic downslope starting at 400 feet west of the FTP. On the west side of the detention pond, the Qvt may be as shallow as about 12 feet bgs (boring FP-MW5, in Figure 2).

The full thickness of the Qvt has reportedly not been fully penetrated by explorations in the vicinity of the FTP. The Qvt appears to extend down to at least elevation of 461 feet NAVD88 (105 feet depth bgs) at boring FP-MW4 within the footprint of the FTP.

- **Vashon Advance Outwash (Qva) and older units:** Qva has been identified at sites on and near the SCA, typically consisting of sand with varying amounts of silt and gravel (Newcomb, 1952; Thomas and others, 1997; Landau Associates, 2019). Approximately 3,000 to 4,600 feet southeast of the FTP, in the vicinity of the TECT Aerospace Leasehold site, a series of relatively deep (150 to 152 feet) environmental wells encountered what has been interpreted as Qva deposits (primarily clean to silty sands) below the Qvt (Landau Associates, 2019).

Landau Associates interpreted the top of the Qva soils at these locations to be at approximately elevation 536 to 507 feet (vertical datum not stated, assumed to be NAVD88). Thomas and others (1997) postulated that the Qva deposits may be on the order of 250 feet thick in the SCA vicinity and are perched on fine-grained sediments (transitional beds, Qtb, generally a confining layer) above roughly elevation 200 feet. Thomas and others (1997) indicate that undifferentiated sediments (Qu) are present beneath the Qtb, with the Qu mostly being an aquifer.

2.2 Groundwater

2.2.1 Near-Surface Perched Groundwater

Competent Qvt is typically an aquitard and groundwater has been encountered perched on the competent Qvt (within the weathered Qvt and fill soils) at the FTP site. Although, groundwater may exist within relatively more permeable zones of the Qvt unit. Boring FP-MW4 was advanced through approximately 75 feet of competent Qvt (105 feet total depth) within the footprint of the FTP. Groundwater was not observed within the competent Qvt unit at boring FP-MW4.

Six monitoring wells in the FTP vicinity (FP-MW1 to FP-MW6, Figure 2) were installed in 2022 to allow for measurement of the perched groundwater levels, as part of this Data Report. Groundwater levels were measured approximately quarterly for a full year (June 2022 through March 2023). Seasonal fluctuations ranged from approximately 0.6 to 5.9 feet. Construction details for these wells and groundwater levels are presented in Tables 1 and 2, respectively.

Based on measurements from the six monitoring wells, the groundwater gradient for near-surface perched groundwater is interpreted to be generally westerly from the FTP and the direction was relatively consistent over the monitoring events. Groundwater contours and gradients from the monitoring events are presented in Figures 6A through 6E.

2.2.2 Deeper Groundwater

At the FTP site, the presence of one or more aquifers below the Qvt in the Qva unit has not been directly confirmed but is anticipated, based on logs of other deep wells drilled on and in the vicinity of the SCA. A Qva aquifer was identified by deep monitoring wells at the TECT Aerospace Leasehold site, about 0.6 mile southeast of the FTP. There, the Qva potentiometric surface is at approximately 468 feet elevation, which corresponds to 98 feet bgs at the FTP, with the Qva groundwater gradient being reportedly to the north/northeast (Landau Associates, 2019). This groundwater level is over 100 feet higher than that estimated by U.S. Geological Survey (USGS) authors Thomas and others (1997) and Newcomb (1952) for the Qva aquifer in the SCA vicinity (about elevation 340 to 350 feet, corresponding to 226 to 216 feet bgs at the FTP), based on groundwater levels measured in deep wells in areas surrounding the SCA. Therefore, it appears multiple aquifers may exist within the layer that has been described as Qva. Alternatively, some of the groundwater elevations reported for the Qva by these USGS authors may in fact be more representative of the underlying Qu aquifer system, for at least some of the relatively deep wells identified by these authors in the SCA vicinity.

Newcomb (1952) and Thomas and others (1997) postulated that the gradient in the Qva aquifer is generally to the northwest or west/southwest, respectively, in the vicinity of the FTP. This implies that the Qva aquifer gradient would likely be influenced by the presence of deeply incised drainages such as Big Gulch Creek (Figure 1), which is located west/northwest of the FTP.

For this Data Report, boring FP-MW4 was advanced to 105 feet bgs to search for indications of groundwater within the competent Qvt or in the deeper Qva unit. Competent Qvt was observed at 30 feet bgs to 105 feet bgs. The Qva unit was not encountered. Indications of deeper groundwater, such as saturated soil, were not encountered between 30 to 105 feet bgs.

2.3 Surface Water

Surface water bodies within 1 mile of the FTP include stormwater detention ponds and small streams (creeks) that drain to the Puget Sound, which is approximately 1.6 miles to the northwest.

We observed groundwater seepage daylighting on the slope to the west of the FTP at approximate elevations of 516 to 519 feet NAVD88 in the area roughly delineated on Figures 6D and 6E. The elevations of the seeps are consistent with the interpreted approximate perched groundwater level contours, suggesting that the seepage was from perched groundwater. The seeps were located approximately 530 feet to the west of the FTP and hydraulically downgradient. The seeps drain into the stormwater detention pond at the base of the slope.

Stormwater runoff from the vicinity of the FTP is collected in catch basins and piped to a stormwater detention pond located at the base of the slope to the west of the FTP and possibly to the vegetated area to the northwest of the FTP (Figure 3). The detention pond has an outlet pipe that acts as a spillway under the Mukilteo Speedway and discharges to Big Gulch Creek on the other side of the speedway. Big Gulch Creek drains to the Puget Sound approximately two miles downstream to the northwest.

3 BENEFICIAL WATER USER SURVEY

We performed a search of publicly available literature and databases and performed interviews to gather information regarding potential groundwater and surface water beneficial users in the vicinity of the FTP. A minimum search radius of 1 mile from the FTP was selected. A summary of findings is provided in this section. A more detailed discussion is provided in Appendix C.

3.1 Groundwater User Survey

We identified two abandoned or unused water supply wells and no active groundwater rights within the search radius:

- Well ID 22B01: A reportedly abandoned production well that is located approximately 0.5 mile to the northeast of the FTP.
- Well ID 28B01: An irrigation well that may still exist but is reportedly unused and is located on the Harbour Pointe Golf Course approximately 0.95 mile to the southwest of the FTP.

3.2 Surface Water User Survey

Surface water within the search radius consisted of several creeks, wetlands, and stormwater detention ponds. We did not identify active surface water rights within the search radius.

4 ANALYTICAL RESULTS AND DISCUSSION

Field explorations occurred during several mobilizations from May 2022 to March 2023. An outline of field explorations is provided below:

- Soil samples were collected from 16 borings at depths ranging from 0.2 to 11.6 feet bgs, except one soil sample from a depth of 105 feet.
- Groundwater samples were collected from temporary sampling points placed within four borings located hydraulically upgradient or crossgradient from the FTP.
- Six groundwater monitoring wells were installed to measure the groundwater perched on the Vashon Till (Qvt) unit at the location of the FTP and downgradient. Well construction details are provided in Table 1.
- Groundwater levels in the monitoring wells were measured approximately quarterly from June 2022 to March 2023. Groundwater levels are listed in Table 2.
- Groundwater samples were collected from select monitoring wells during June 2022 and November/December 2022.
- The steep slope to the west of the FTP was inspected for the presence of groundwater seeps during January 2023 and March 2023.
- Soil and groundwater samples were analyzed for PFAS. Soil analytical results are provided in Table 3. Groundwater analytical results are provided in Tables 4 and 5.

A summary of field methods is provided as Appendix D.

Shannon & Wilson reviewed project and QC analytical data to assess whether the data met the designated quality objectives and were acceptable for project use. Based on the results of the data validation, the data was evaluated to be of known quality and acceptable for use as qualified. There was a usable result for each requested analyte for each sample. Data qualifiers assigned during validation were incorporated into the results tables (Tables 3 through 5). Laboratory analytical reports are provided in Appendix E. The quality assurance/quality control summary is provided in Appendix F.

Results of the groundwater level monitoring and soil and groundwater analysis of PFAS are summarized below.

4.1 Groundwater Level Monitoring

Perched groundwater was encountered in fill soils and in the weathered Qvt above the competent Qvt. The depth of groundwater at the FTP, as measured at well FP-MW4, was approximately 14 feet to 20 feet bgs throughout the monitoring period (June 2023 to March 2022). Based on measurements from the six monitoring wells, the groundwater gradient for the perched groundwater is interpreted to be generally westerly from the FTP and the direction was relatively consistent over the monitoring period. Groundwater contours and gradients from the monitoring events are presented in Figures 6A through 6E.

Groundwater seeps were observed as saturated soil in the steep slope face to the west of the FTP in January 2023 and March 2023. The elevation of the seeps appears to correspond with the anticipated elevation of the perched water table, based on measurements of water levels at upgradient wells, suggesting the water seeps are perched groundwater. The locations of the seeps are shown in Figures 6D and 6E.

Further details of local hydrogeology are discussed in Sections 2.2 and 2.3.

4.2 Soil Analytical Results

Soil samples were collected from 16 borings. Typically, soil samples were collected from soil directly underneath the surface vegetation and at the water table interface. The sample collection points were selected because a surface release of PFAS was suspected (spraying of AFFF for firefighting training) and PFAS compounds preferentially sorb to organic-rich soil and concentrate at air/water interfaces in the saturated zone and vadose zone.

34 soil samples were analyzed for 18 PFAS analytes by EPA Method 537.1 (modified). Soil samples were collected from fill soils and weathered Qvt at 0.2 to 11.6 feet bgs, except one soil sample collected from 105 feet bgs at boring FP-MW4 (discussed in next paragraph). Select analytical results are shown in Figures 7A and 7B and Table 3.

At boring FP-MW4, one soil sample was collected from the bottom of the boring in competent Qvt at 105 feet bgs. The purpose of the sample was to evaluate for vertical migration of PFAS through the Qvt.

Findings from the soil analysis are listed below:

- Concentrations of PFAS were detected in each soil sample, except for the 105-foot sample from boring FP-MW4, suggesting that concentrations of PFAS are distributed throughout the fill soil and weathered Qvt at the sample locations.
- Samples collected near the FTP generally had higher concentrations of PFAS than locations farther away, suggesting that the historical use of AFFF at the FTP is the primary release mechanism for PFAS in the vicinity.
- Typically, PFOS followed by perfluorohexanesulfonic acid (PFHxS) were the analytes with the highest concentrations in each sample. The concentration of PFOS was generally one order of magnitude higher than PFHxS. The relative concentrations of PFAS analytes in samples are consistent with a historical release of AFFF.
- The highest detected concentration of PFOS was 820 (flagged B) $\mu\text{g/kg}$ at 0.5 feet bgs at boring FP-P7. The “B” qualifier is assigned because the analyte was detected in the laboratory method blank at 0.405 $\mu\text{g/kg}$. The detection of PFOS in the method blank is unlikely to significantly affect the accuracy of the soil sample result because the concentration in the method blank was three orders of magnitude lower than the concentration of PFOS detected in the soil sample.

4.3 Groundwater Analytical Results

Groundwater samples were collected from temporary sample points placed within four borings located upgradient and crossgradient from the FTP. Additionally, groundwater samples were collected from monitoring wells located at the FTP and downgradient. Groundwater samples were collected from select wells during June 2022 and November/December 2022. Groundwater samples were analyzed for 18 PFAS analytes by EPA Method 537.1 (modified). Select analytical results are shown in Figure 8 and summarized in Tables 4 and 5.

The temporary sampling points and monitoring wells were screening in the perched groundwater since a surface release of PFAS was suspected. The boring for FP-MW4 was drilled to 105 feet depth to search for deeper groundwater within the competent Qvt or in the deeper Vashon Advance Outwash (Qva). The purpose of the deeper monitoring wells was to evaluate for vertical migration of PFAS through the Qvt. Saturated soil was not encountered by 105 feet depth; therefore, FP-MW4 was screened in the perched groundwater.

Findings from the groundwater analysis are listed below:

- Fifteen (15) groundwater samples were collected from 5 monitoring wells and 4 temporary sampling points. Concentrations of PFAS were detected in each groundwater sample.
- Samples collected near the FTP and downgradient generally had higher concentrations of PFAS than locations crossgradient or upgradient from the FTP, suggesting that the historical use of AFFF at the FTP is the primary release mechanism for PFAS in the vicinity.
- Typically, PFOS was the analyte with the highest concentration in each sample. The relative concentrations of PFAS analytes in samples are consistent with a historical release of AFFF.
- The highest detected groundwater concentration of PFOS was 120,000 ng/L (flagged E, B, and J*) at well FP-MW1 sampled during June 2022. The data qualifiers are discussed below:
 - The “E” qualifier is assigned because the result exceeded the calibration range for the instrument.
 - The “B” qualifier is assigned because the analyte was detected in the laboratory method blank at 1.34 ng/L. The detection of PFOS in the method blank is unlikely to significantly affect the accuracy of the soil sample result because the concentration in the method blank was five orders of magnitude lower than the concentration of PFOS detected in the groundwater sample.
 - The “J*” qualifier is assigned since the result is an estimated value due to quality control errors, with no direction of bias.

5 REFERENCES

- AGI Technologies, 1998, Preliminary geotechnical engineering study, proposed kilo ramp development, Snohomish County Airport, Everett, Washington: Report prepared by AGI Technologies, Bellevue, Wash., project no. 15,512.307, April 23.
- CDM, 2007, Soil Remediation Summary Report, FTP, Snohomish County Airport, Everett, Washington: prepared by CDM, Bellevue, Wash., CDM project no. 19947-54348, for Snohomish County Department of Public Works, Everett, Wash., February 26, enclosed as Appendix A.
- CDM Smith, 2018, FTP PFAS investigation, Snohomish County Airport, Everett, Washington: Report prepared by CDM Smith, Bellevue, Wash., for Snohomish County Public Works, Everett, Wash., project no. 19947-230030, October 29, enclosed as Appendix B.

- Landau Associates, 2019, Interim Remedial Investigation Data Report, TECT Aerospace Leasehold, Snohomish County Airport/Paine Field, Everett, Washington: Report prepared by Landau Associates Edmonds, Wash., project no. 0222057.010, for Snohomish County Airport, Everett, Wash., December 31.
- Newcomb, R.C., 1952, Ground-water resources of Snohomish County, Washington: U.S. Geological Survey Water-Supply Paper 1135, 133 p., 2 plates, available: <https://pubs.er.usgs.gov/publication/wsp1135>.
- Thomas, B.E.; Wilkinson, J.M.; and Embrey, S.S., 1997, The ground-water system and ground-water quality in western Snohomish County, Washington: U.S. Geological Survey Water-Resources Investigations Report 96-4312, 218 p., 9 plates, available: <https://pubs.er.usgs.gov/publication/wri964312>.
- Washington State Department of Ecology (Ecology), 2007, No further action determination under WAC 173-340-515(5) for the following hazardous waste site: Name: SCA FTP, Address: Snohomish County Airport, Everett, WA, facility/site no. 49626114, VCP no. 1750: Prepared by Washington State Department of Ecology, Northwest Regional Office, Bellevue, Wash., June 27.

Table 1: Monitoring Well Completion Details

Well No.	Ecology Tag	Install Date	Northing ^a	Easting ^a	Metal Lid Elevation (feet) ^a	North Side Top of Casing Elevation (feet) ^a	Filter Pack		Screen		Approx. Well Bottom Elevation (feet)	Casing Materials
							Approx. Depth (feet bgs)	Approx. Elevation (feet)	Approx. Depth (feet bgs)	Approx. Elevation (feet)		
FP-MW1	BPK-751	05/24/22	332655.76	1283056.89	565.33	564.95	13.0 - 25.0	552.3 - 540.3	15.0 - 24.8	550.3 - 540.6	540.3	PVC, 1.125-inch OD 0.875-inch ID
FP-MW2	BPK-752	05/25/22	332748.45	1282772.52	559.79	559.19	28.0 - 40.0	531.8 - 519.8	30.0 - 39.8	529.8 - 520.0	519.8	
FP-MW3	BPK-753	05/25/22	332546.81	1282759.01	559.55	559.29	31.0 - 43.0	528.6 - 516.6	33.0 - 42.8	526.6 - 516.8	516.6	
FP-MW4	BNL-692	05/27/22	332716.32	1283101.44	566.36	565.97	19.5 - 32.0	546.9 - 534.4	22.0 - 31.8	544.4 - 534.6	534.4	PVC, 2-inch Sch. 40
FP-MW5	BPL-660	10/24/22	332797.78	1282481.65	523.41	523.24	7.0 - 18.7	516.4 - 504.7	8.7 - 18.5	514.7 - 504.9	504.7	PVC, 2-inch Sch. 40
FP-MW6	BPL-661	10/24/22	332649.66	1282493.76	522.23	521.91	3.0 - 14.0	519.2 - 508.2	4.0 - 13.8	518.2 - 508.4	508.2	PVC, 1.125-inch OD 0.875-inch ID

NOTES:
a Northings and eastings and elevation data surveyed by APS Survey & Mapping of Bellevue, Washington on June 2, 202,2 and November 8, 2022. Horizontal datum is State Plane of Washington Coordinate System of 1983, 2011 Adjustment (North American Datum of 1983 [NAD83/2011]). Vertical datum is North American Vertical Datum of 1988 (NAVD88, geoid 18).
Approx. = approximate; bgs = below ground surface; Ecology = Washington State Department of Ecology; ID = inside diameter; OD = outside diameter; PVC = polyvinyl chloride;
Sch. = Schedule

Table 2: Groundwater Level Measurements

Well No.	Screened Interval Elevation (feet)	TOC Elevation ^a (feet)	Date	Depth to Water (feet below TOC)	Groundwater Elevation ^a
FP-MW1	540.58 - 550.33	564.95	6/2/2022	16.09	548.86
			9/9/2022	19.14	545.81
			11/21/2022	19.78	545.17
			1/10/2023	13.89	551.06
			3/9/2023	15.02	549.93
FP-MW2	520.04 - 529.79	559.19	6/3/2022	31.74	527.45
			9/9/2022	32.86	526.33
			11/21/2022	32.98	526.21
			1/10/2023	30.99	528.20
			3/9/2023	31.23	527.96
FP-MW3	516.80 - 526.55	559.29	6/2/2022	31.10	528.19
			9/9/2022	35.11	524.18
			11/21/2022	34.10	525.19
			1/10/2023	30.34	528.95
			3/9/2023	30.76	528.53
FP-MW4	534.61 - 544.36	565.97	6/2/2022	16.00	549.97
			9/9/2022	19.43	546.54
			11/21/2022	20.28	545.69
			1/10/2023	14.41	551.56
			3/9/2023	15.05	550.92
FP-MW5	504.91 - 514.71	523.24	11/21/2022	9.95	513.29
			1/10/2023	9.34	513.90
			3/9/2023	9.46	513.78
FP-MW6	508.43 - 518.23	521.91	11/21/2022	Dry	Dry
			1/10/2023	7.80	514.11
			3/9/2023	9.62	512.29

NOTES:

a The reference vertical datum is the North American Vertical Datum (NAVD88).

bgs = below ground surface; TOC = top of casing

Table 3: Soil Analytical Results - May 2022

Exploration Location	FP-P1		FP-P2		FP-P3		FP-P4		FP-P5		FP-P6		FP-P7			FP-P8			FP-P9	
	Sample ID	FP-P1:0.2	FP-P1:10.2	FP-P2:0.2	FP-P2:5.3	FP-P3:1.2	FP-P3:6.3	FP-P4:1.4	FP-P4:11.6	FP-P5:0.5	FP-P5:7.5	FP-P6:0.5	FP-P6:3.4	FP-P7:0.5	FP-P100:0.5	FP-P7:7.0	FP-P8:1.5	FP-P101:1.5	FP-P8:6.3	FP-P9:0.5
Depth [feet bgs]	0.2	10.2	0.2	5.3	1.2	6.3	1.4	11.6	0.5	7.5	0.5	3.4	0.5	0.5	7	1.5	1.5	6.3	0.5	6.5
DONA	<0.22	<0.24	<0.2	<0.22	<0.27	<0.23	<0.2	<0.25	<0.2	<0.23	<0.22	<0.25	<0.2	<0.2	<0.22	<0.21	<0.21	<0.22	<0.21	<0.24
F-53B Major	<0.22	<0.24	<0.2	<0.22	<0.27	<0.23	<0.2	<0.25	<0.2	<0.23	<0.22	<0.25	<0.2	<0.2	<0.22	<0.21	<0.21	<0.22	<0.21	<0.24
F-53B Minor	<0.22	<0.24	<0.2	<0.22	<0.27	<0.23	<0.2	<0.25	<0.2	<0.23	<0.22	<0.25	<0.2	<0.2	<0.22	<0.21	<0.21	<0.22	<0.21	<0.24
HFPO-DA	<0.22	<0.24	<0.2	<0.22	<0.27	<0.23	<0.2	<0.25	<0.2	<0.23	<0.22	<0.25	<0.2	<0.2	<0.22	<0.21	<0.21	<0.22	<0.21	<0.24
NEtFOSAA	<0.22	<0.24	<0.2	<0.22	<0.27	<0.23	<0.2	<0.25	<0.2	<0.23	<0.22	<0.25	0.32	0.33	<0.22	<0.21	<0.21	<0.22	<0.21	<0.24
NMeFOSAA	<0.22	<0.24	<0.2	<0.22	<0.27	<0.23	<0.2	<0.25	<0.2	<0.23	<0.22	<0.25	0.13 I JH*	0.093 I JH*	<0.22	<0.21	<0.21	<0.22	<0.21	<0.24
PFBS	<0.22	<0.24	<0.2	0.24	<0.27	<0.23	<0.2	<0.25	<0.2	0.14 J	<0.22	<0.25	0.26	0.2	0.18 J	<0.21	<0.21	<0.22	0.06 J	0.2 J
PFDA	<0.22	<0.24	<0.2	<0.22	<0.27	<0.23	<0.2	<0.25	0.076 J	<0.23	0.11 J	<0.25	0.83	0.73	<0.22	<0.21	<0.21	<0.22	<0.21	<0.24
PFDaA	<0.22	<0.24	<0.2	<0.22	<0.27	<0.23	<0.2	<0.25	<0.2	<0.23	0.035 J	<0.25	0.48	0.42	<0.22	<0.21	<0.21	<0.22	<0.21	<0.24
PFHpA	0.041 J	<0.24	<0.2	0.4	2.8	0.63	0.62	1.3	0.045 J	0.22 J	0.055 J	0.087 J	0.14 J	0.11 J	0.11 J	0.075 J	0.093 J	0.09 J	<0.21	0.052 J
PFHxA	0.057 J	<0.24	0.075 J	1.1	6	3	0.58	3	0.049 J	0.29	0.058 J	0.1 J	0.63 JH*	0.49 JH*	0.63	0.14 J	0.21	0.17 J	0.24	0.59
PFHxS	0.032 J	0.051 J	0.14 J	24	0.11 I,J*	0.14 J	0.24	0.27	0.36	2.4	0.27	0.58	10	9	7.1	0.18 J*	0.39 J*	0.22	2.9	6.7
PFNA	0.16 J	<0.24	<0.2	<0.22	0.083 J	<0.23	0.47	0.028 J	0.31	<0.23	0.35	0.032 J	6.7 JH*	6.5 JH*	3.8	0.78 J*	1.6 J*	0.049 J	0.12 J	0.12 J
PFOA	<0.22	<0.24	<0.2	1.2	0.082 J	<0.23	0.48	0.53	0.17 J	1.2	<0.22	0.17 J	1.5 JH*	1.4 JH*	0.82	0.13 J	0.19 J	0.31	0.11 J	0.4
PFOS	0.35	0.26 I,J*	0.53	1.6	7.3	0.11 J	3	0.12 J	5.3	<0.23	28	0.89	820 B	720 B	270 B	14 B J*	25 B J*	1.2	74	82
PFTeA	<0.22	<0.24	<0.2	<0.22	<0.27	<0.23	<0.2	<0.25	<0.2	<0.23	<0.22	<0.25	0.32 J*	0.19 J*	<0.22	<0.21	<0.21	<0.22	<0.21	<0.24
PFTriA	<0.22	<0.24	<0.2	<0.22	<0.27	<0.23	<0.2	<0.25	0.071 J	<0.23	0.51	<0.25	11	7.7	<0.22	0.14 J	0.14 J	<0.22	<0.21	<0.24
PFUnA	<0.22	<0.24	<0.2	<0.22	<0.27	<0.23	<0.2	<0.25	0.14 J	<0.23	1.4	<0.25	29	23	<0.22	0.13 J	0.13 J	<0.22	<0.21	<0.24

Table 3 - Soil Analytical Results - May 2022

Exploration Location	FP-SH1	FP-SH2	FP-HA1		FP-MW1			FP-MW2			FP-MW3			FP-MW4
Sample ID	FP-SH1:0.5	FP-SH2:0.5	FP-HA1:0.8	FP-HA1:4.0	FP-MW1:0.4	FP-MW100:0.4	FP-MW1:7.6	FP-MW2:0.5	FP-MW101:0.5	FP-MW2:7.0	FP-MW3:0.5	FP-MW102:0.5	FP-MW3:2.7	FP-MW4:105.0
Depth [feet bgs]	0.5	0.5	0.8	4	0.4	0.4	7.6	0.5	0.5	7	0.5	0.5	2.7	1.5
DONA	<0.22	<0.21	<0.21	<0.22	<0.21	<0.21	<0.22	<0.21	<0.22	<0.22	<0.21	<0.22	<0.2	< 0.21
F-53B Major	<0.22	<0.21	<0.21	<0.22	<0.21	<0.21	<0.22	<0.21	<0.22	<0.22	<0.21	<0.22	<0.2	< 0.21
F-53B Minor	<0.22	<0.21	<0.21	<0.22	<0.21	<0.21	<0.22	<0.21	<0.22	<0.22	<0.21	<0.22	<0.2	< 0.21
HFPO-DA	<0.22	<0.21	<0.21	<0.22	<0.21	<0.21	<0.22	<0.21	<0.22	<0.22	<0.21	<0.22	<0.2	< 0.21
NEtFOSAA	<0.22	<0.21	<0.21	<0.22	0.087 J	0.058 J	<0.22	<0.21	<0.22	<0.22	<0.21	<0.22	<0.2	< 0.21
NMeFOSAA	<0.22	<0.21	<0.21	<0.22	0.039 J	<0.21	<0.22	<0.21	<0.22	<0.22	<0.21	<0.22	<0.2	< 0.21
PFBS	<0.22	<0.21	<0.21	<0.22	<0.21	<0.21	0.14 J	<0.21	<0.22	<0.22	<0.21	<0.22	<0.2	< 0.21
PFDA	1.9	3.5	0.4	<0.22	0.29	0.4	0.055 J	<0.21	<0.22	<0.22	<0.21	<0.22	<0.2	< 0.21
PFDaA	0.32	0.26	0.037 J	<0.22	0.41	0.27	<0.22	<0.21	<0.22	<0.22	<0.21	<0.22	<0.2	< 0.21
PFHpA	0.97	0.84	0.81	1.3	0.053 J	0.054 J	0.05 J	<0.21	<0.22	<0.22	0.067 J	0.049 J	0.18 J	< 0.21
PFHxA	5.9	2.0	1.5	3.1	0.24	0.25	0.34	0.053 J	0.034 J	<0.22	0.12 J*	0.072 J*	0.3	< 0.21
PFHxS	0.2 J	0.26	0.06 J	0.12 J	2.7	2.6	7.5	0.04 J	0.04 J	0.16 J	3.6	2.5	1.0	< 0.21
PFNA	1.2	1.8	1.1	0.13 J	0.47	0.48	4.9	<0.21	<0.22	<0.22	0.16 J*	0.09 J*	0.085 J	< 0.21
PFOA	0.7	0.5	0.15 J	0.084 J	0.22	0.25	0.26	0.06 J	<0.22	<0.22	0.16 J*	0.11 J*	0.12 J	< 0.21
PFOS	5.1	4.7	1.2	0.38	75 E J*	94 E J*	200 B	0.39	0.25	<0.22	18	5.0	3.1	< 0.21
PFTeA	0.087 J	0.068 J	<0.21	<0.22	0.19 J*	0.067 J*	<0.22	<0.21	<0.22	<0.22	<0.21	<0.22	<0.2	< 0.21
PFTriA	0.097 J	0.085 J	0.066 J	<0.22	11 J*	5.6 J*	<0.22	<0.21	<0.22	<0.22	0.06 J	<0.22	<0.2	< 0.21
PFUnA	0.74	1.4	0.26	<0.22	14	11	<0.22	<0.21	<0.22	<0.22	0.14 J	<0.22	<0.2	< 0.21

NOTES:

Units are micrograms per kilogram (µg/kg).

Bolded text indicates the analyte was detected above the reporting limit.

B = Compound was found in the lab blank and sample. Flag applied by the laboratory.

J = Result is less than the reporting level but greater than or equal to the method detection limit and the concentration is an approximate value. Flag applied by the laboratory.

J* = Result is reported as an estimated value, no direction of bias, due to a quality control failure. Flag applied by Shannon & Wilson (*).

JH* = Estimated concentration, biased high due to quality control failures. Flag applied by Shannon & Wilson (*)

bgs = below ground surface

Abbreviation	Definition
DONA	4,8-Dioxa-3H-perfluorononanoic acid
F-53B Major	9Cl-PF3ONS
F-53B Minor	11Cl-PF3OUdS
HFPO-DA	Hexafluoropropylene oxide dimer acid
NEtFOSAA	N-ethylperfluorooctanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluorooctanesulfonamidoacetic acid
PFBS	Perfluorobutanesulfonic acid
PFDA	Perfluorodecanoic acid
PFDaA	Perfluorododecanoic acid
PFHpA	Perfluoroheptanoic acid
PFHxA	Perfluorohexanoic acid
PFHxS	Perfluorohexanesulfonic acid
PFNA	Perfluorononanoic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PFTeA	Perfluorotetradecanoic acid
PFTriA	Perfluorotridecanoic acid
PFUnA	Perfluoroundecanoic acid

Table 4: Groundwater Analytical Results - June 2022

Exploration Location	FP-P2	FP-P3	FP-P4	FP-P9	FP-MW1		FP-MW2	FP-MW3	FP-MW4	Equipment Blank	Equipment Blank
Sample ID	FP-P2:GW	FP-P3:GW	FP-P4:GW	FP-P9:GW	FP-MW1:GW	FP-MW100:GW	FP-MW2:GW	FP-MW3:GW	FP-MW4:GW	FP-EB1	FP-EB2
Source	Temp. Point	Temp. Point	Temp. Point	Temp. Point	Monitor Well	Duplicate	Monitor Well	Monitor Well	Monitor Well	Equipment Blank from a peristaltic pump and single-use tubing.	Equipment blank from a decontaminated bladder pump and single-use tubing.
DONA	<1.8	<1.7	<1.8	<1.8	< 1.9	< 1.8	< 2.0	< 1.8	< 1.8	< 1.9	< 1.9
F-53B Major	<1.8	<1.7	<1.8	<1.8	< 1.9	< 1.8	< 2.0	< 1.8	< 1.8	< 1.9	< 1.9
F-53B Minor	<1.8	<1.7	<1.8	<1.8	< 1.9	< 1.8	< 2.0	< 1.8	< 1.8	< 1.9	< 1.9
HFPO-DA	<3.6	<3.5	<3.6	<3.6	< 3.8	< 3.7	< 4.0	< 3.6	< 3.7	< 3.7	< 3.7
NEtFOSAA	<4.5	<4.4	<4.5	<4.5	< 4.7	< 4.6	< 5.0	< 4.5	< 4.6	< 4.7	< 4.6
NMeFOSAA	<4.5	<4.4	<4.5	<4.5	< 4.7	< 4.6	< 5.0	< 4.5	< 4.6	< 4.7	< 4.6
PFBS	55	9.4	79	7.3	1100	970	340	320	660	< 1.9	< 1.9
PFDA	<1.8	<1.7	<1.8	<1.8	20	18	< 2.0	6.5	15	< 1.9	< 1.9
PFDaA	<1.8	<1.7	<1.8	<1.8	< 1.9	< 1.8	< 2.0	< 1.8	< 1.8	< 1.9	< 1.9
PFHpA	23	660	320	1.3 J	780	630	360	220	300	< 1.9	0.86 J
PFHxA	99	3500	1000	11	2900	2900	1100	580	1400	< 1.9	0.87 J
PFHxS	530	130 J*	440	120	13000	13000	1800	4100	8000	< 1.9	< 1.9
PFNA	<1.8	<1.7	7.1	0.92 J	10000	10000	28	1600	4600	< 1.9	< 1.9
PFOA	3.8	12	180	6.8	2300	2600	230	1100	840	< 1.9	< 1.9
PFOS	19	1.9	89	290	89000 E,B,J*	120000 E,B,J*	1000 B	27000 B	37000 E,B,J*	1.6 J B	4.8 I B
PFTeA	<1.8	<1.7	<1.8	<1.8	< 1.9	< 1.8	< 2.0	< 1.8	< 1.8	< 1.9	< 1.9
PFTriA	<1.8	<1.7	<1.8	<1.8	< 1.9	< 1.8	< 2.0	< 1.8	< 1.8	< 1.9	< 1.9
PFUnA	<1.8	<1.7	<1.8	<1.8	3.0	3.0	< 2.0	4.4	3.2	< 1.9	< 1.9

NOTES:

Units are nanograms per liter (ng/L).

Bolded text indicates the analyte was detected above the reporting limit.

B = Compound was found in the lab blank and sample. Flag applied by the laboratory.

E = Result exceeds calibration range. Flag applied by the laboratory.

I = Value is an estimated maximum possible concentration. Flag applied by the laboratory.

J = Result is less than the reporting level but greater than or equal to the method detection limit and the concentration is an approximate value. Flag applied by the laboratory.

J* = Result is reported as an estimated value, no direction of bias, due to a quality control failure. Flag applied by Shannon & Wilson (*).

* = Flag applied by Shannon & Wilson.

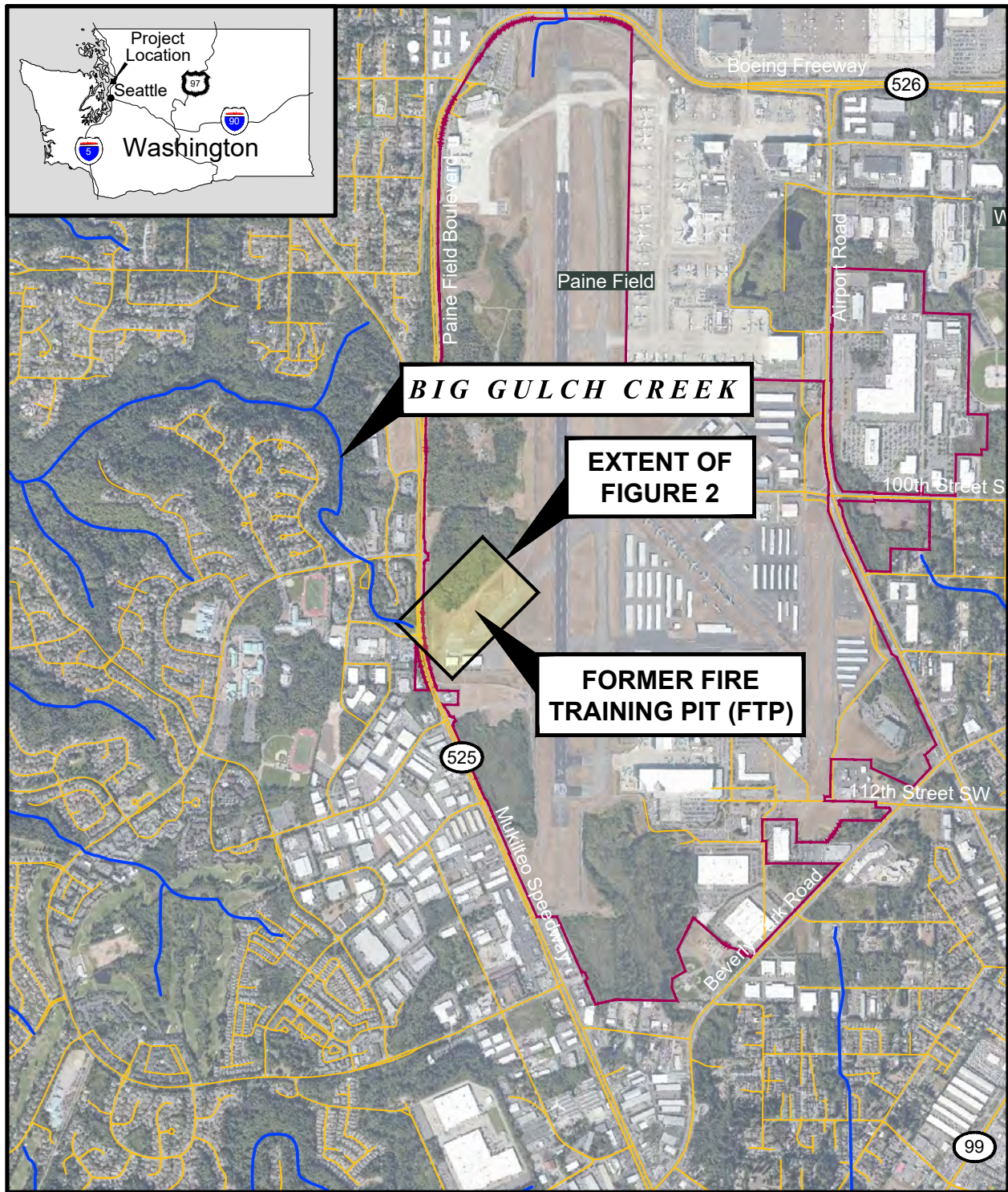
Abbreviation	Definition
DONA	4,8-Dioxa-3H-perfluorononanoic acid
F-53B Major	9Cl-PF3ONS
F-53B Minor	11CL-PF3OUdS
HFPO-DA	Hexafluoropropylene oxide dimer acid
NEtFOSAA	N-ethylperfluorooctanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluorooctanesulfonamidoacetic acid
PFBS	Perfluorobutanesulfonic acid
PFDA	Perfluorodecanoic acid
PFDaA	Perfluorododecanoic acid
PFHpA	Perfluoroheptanoic acid
PFHxA	Perfluorohexanoic acid
PFHxS	Perfluorohexanesulfonic acid
PFNA	Perfluorononanoic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PFTeA	Perfluorotetradecanoic acid
PFTriA	Perfluorotridecanoic acid
PFUnA	Perfluoroundecanoic acid

Table 5: Groundwater Analytical Results - November 2022

Exploration Location	FP-MW1**	FP-MW2	FP-MW3	FP-MW4		FP-MW5	Equipment Blank	Equipment Blank
Sample ID	FP-MW1-12142022	FP-MW2-11232022	FP-MW3-11232022	FP-MW4-11212022	FP-MW100-11212022	FP-MW5-11212022	EB-1-11222022	EB-2-11222022
Source	Monitor Well	Monitor Well	Monitor Well	Monitor Well	Duplicate	Monitor Well	Equipment blank from a decontaminated bladder pump and single-use tubing.	Equipment Blank from a peristaltic pump and single-use tubing.
DONA	<1.8	<1.8	<1.8	<1.8	<1.8	<1.9	<1.8	<1.8
F-53B Major	<1.8	<1.8	<1.8	<1.8	<1.8	<1.9	<1.8	<1.8
F-53B Minor	<1.8	<1.8	<1.8	<1.8	<1.8	<1.9	<1.8	<1.8
HFPO-DA	<3.6	<3.6	<3.6	<3.7	<3.7	<3.7	<3.7	<3.7
NEtFOSAA	75	<4.4	<4.5	<4.6	<4.6	<4.7	<4.6	<4.6
NMeFOSAA	73	<4.4	<4.5	<4.6	<4.6	<4.7	<4.6	<4.6
PFBS	670	630	750	570	540	2.2	<1.8	<1.8
PFDA	18	<1.8	16	7.4	7.4	<1.9	<1.8	<1.8
PFDaA	<1.8	<1.8	<1.8	<1.8	<1.8	<1.9	<1.8	<1.8
PFHpA	520	280	510	190	190	1.9	<1.8	<1.8
PFHxA	2000	730	1300	880	980	2.5	<1.8	<1.8
PFHxS	9400	3500	9300	4800	6800	1.8 J	<1.8	<1.8
PFNA	5100	64	3800	2300	2100	0.49 J	<1.8	<1.8
PFOA	1300	380	2100	440	410	1.8 J	<1.8	<1.8
PFOS	80000 E,J*	1700	54000 E,J*	26000	27000	3.5	<1.8	<1.8
PFTeA	<1.8	<1.8	<1.8	<1.8	<1.8	<1.9	<1.8	<1.8
PFTriA	<1.8	<1.8	<1.8	<1.8	<1.8	<1.9	<1.8	<1.8
PFUnA	1.1 J	<1.8	9.1	1.1 J	1.2 J	<1.9	<1.8	<1.8

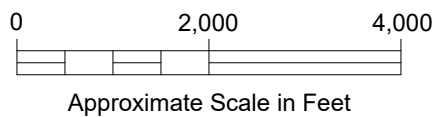
NOTES:
Units are nanograms per liter (ng/L).
Bolded text indicates the analyte was detected above the reporting limit.
E = Result exceeds calibration range.
J = Result is less than the reporting level but greater than or equal to the method detection limit and the concentration is an approximate value.
* - Flag applied by Shannon & Wilson.
** Well FP-MW1 was sampled at a later date (12/14/2022) than other wells due to low recharge rate observed during the November sampling attempt. Other wells were sampled during 11/21/2022 through 11/23/2022.

Abbreviation	Definition
DONA	4,8-Dioxa-3H-perfluorononanoic acid
F-53B Major	9CI-PF3ONS
F-53B Minor	11CL-PF3OUdS
HFPO-DA	Hexafluoropropylene oxide dimer acid
NEtFOSAA	N-ethylperfluorooctanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluorooctanesulfonamidoacetic acid
PFBS	Perfluorobutanesulfonic acid
PFDA	Perfluorodecanoic acid
PFDaA	Perfluorododecanoic acid
PFHpA	Perfluoroheptanoic acid
PFHxA	Perfluorohexanoic acid
PFHxS	Perfluorohexanesulfonic acid
PFNA	Perfluorononanoic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PFTeA	Perfluorotetradecanoic acid
PFTriA	Perfluorotridecanoic acid
PFUnA	Perfluoroundecanoic acid



LEGEND

- Approximate Property Boundary of Snohomish County Airport
- Watercourses (Streams)



Former Fire Training Pit
Snohomish County Airport
Everett, Washington

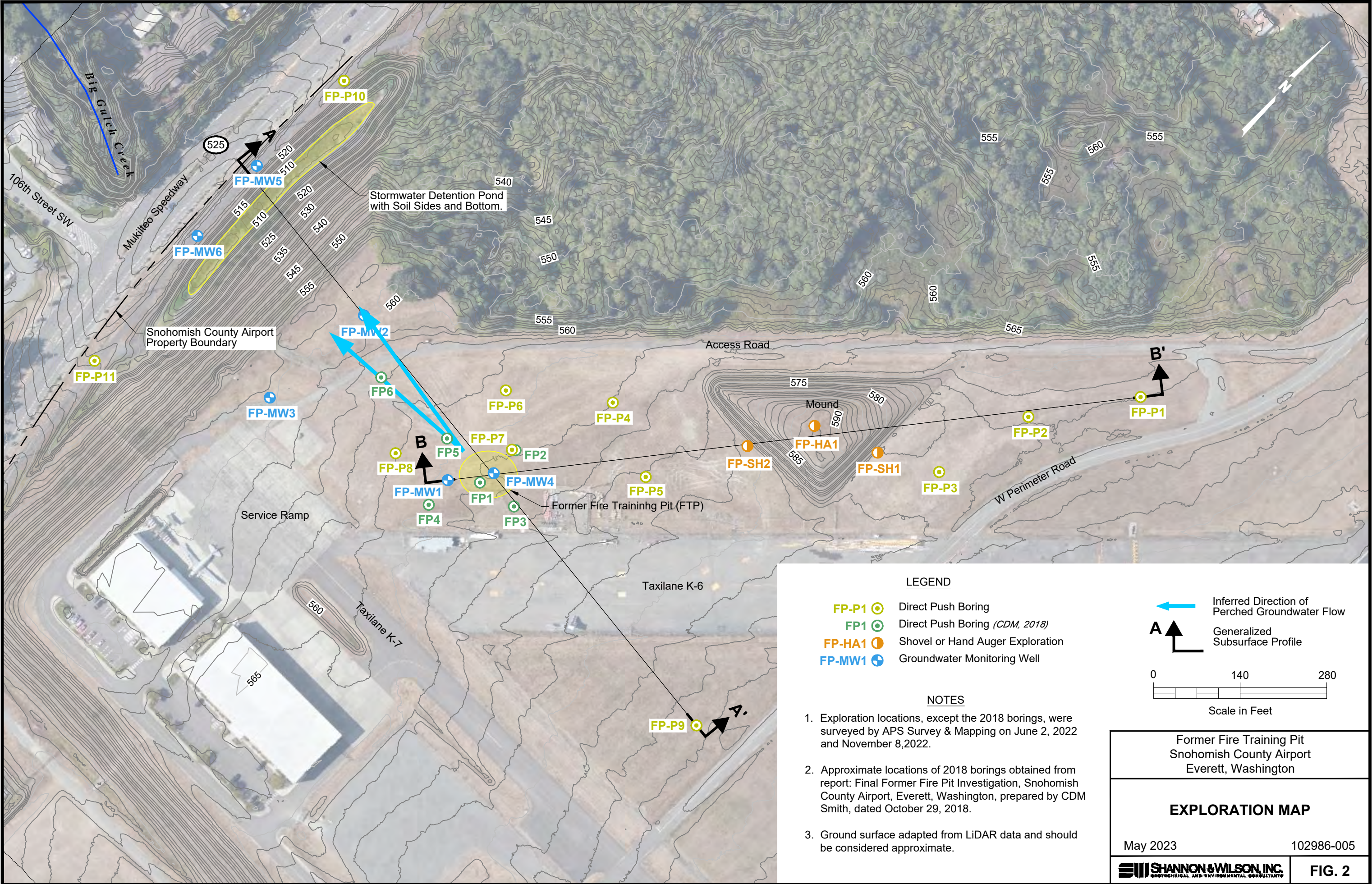
VICINITY MAP

May 2023

102986-005

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GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 1

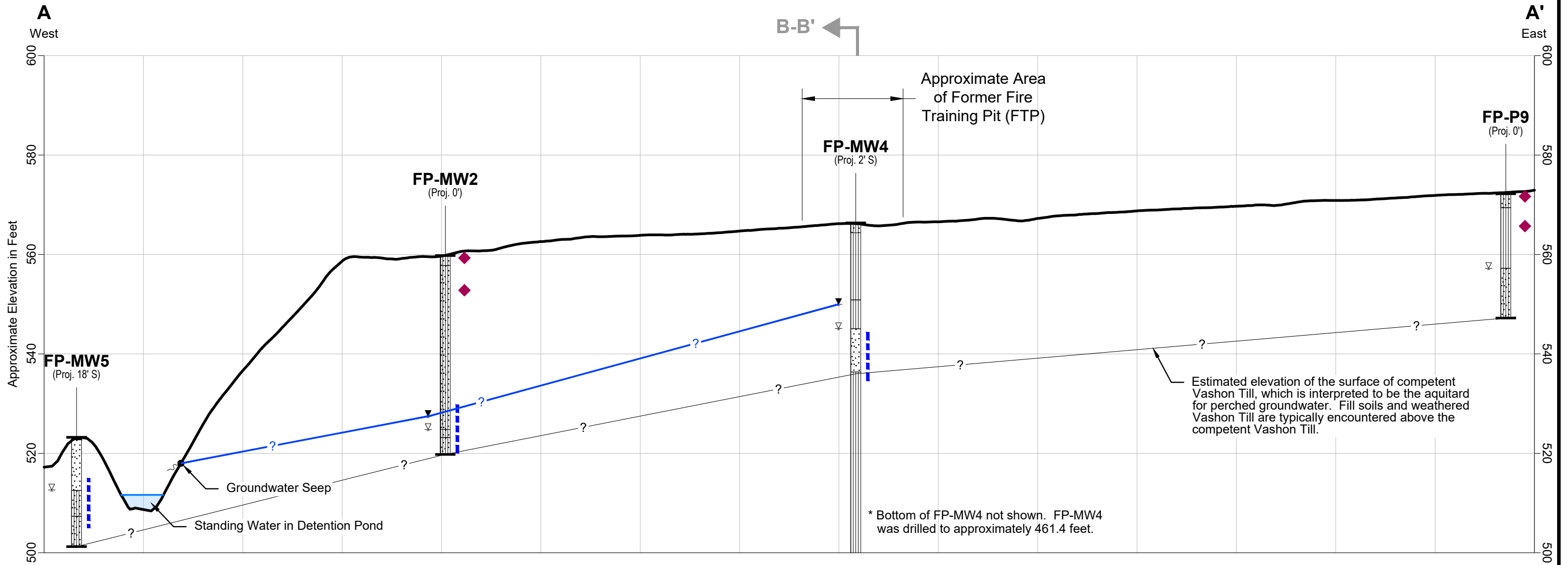




NOTES:

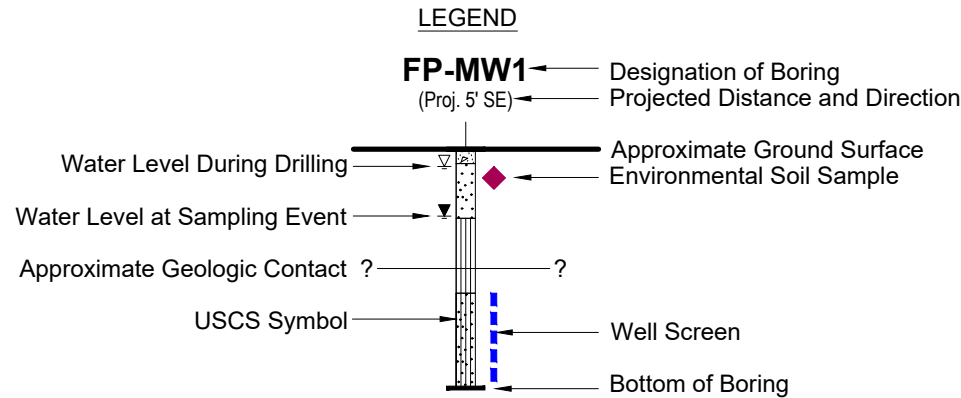
- 1. Drainage data was obtained from Snohomish County GIS, Drainage Inventory Interactive Map & Data, on March 29, 2023 website: <https://snohomishcountywa.gov/1129/Drainage-GIS>.
- 2. Locations are approximate.

Filename: C:\Users\jrs\CAD Group\Dropbox\JDrive\SEA\102986\005\102986-005 Plan and Profiles.dwg Login: JRS Date: 04-28-2023 Layout: Figure 4



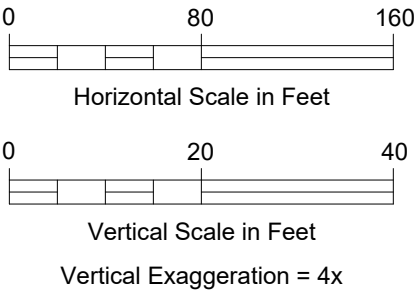
UNIFIED SOIL
CLASSIFICATION SYSTEM

GP		SM
GW		SC
GP-GM		CL
GW-GM		ML
GM		OL
GC		CH
SW		MH
SP		OH
SW-SM		PT
SP-SM		



NOTES

- Ground surface adapted from LiDAR data and should be considered approximate.
- This subsurface profile is generalized from materials observed in soil borings. Variations may exist between profile and actual conditions.
- Vertical datum is NAVD88.



Former Fire Training Pit
Snohomish County Airport
Everett, Washington

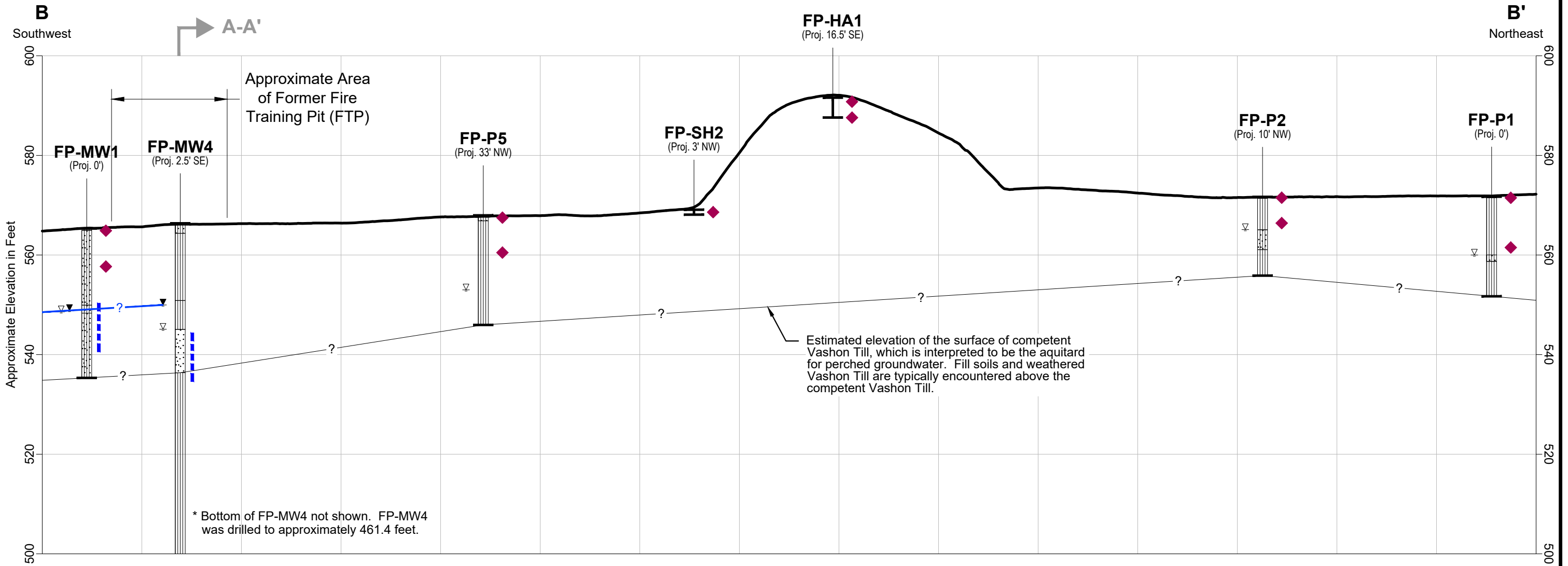
GENERALIZED SUBSURFACE
PROFILE A-A'

May 2023 102986-005

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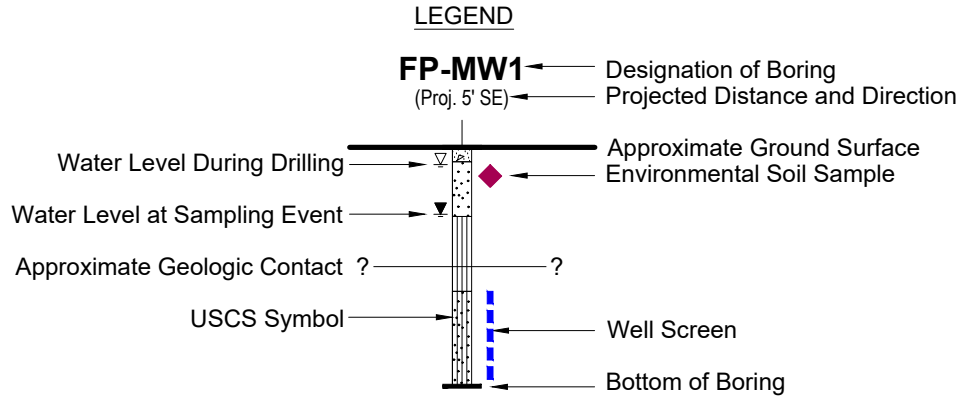
FIG.4

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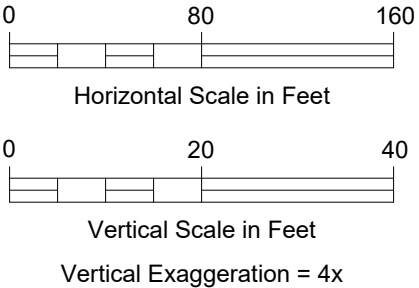
UNIFIED SOIL
CLASSIFICATION SYSTEM

GP		SM
GW		SC
GP-GM		CL
GW-GM		ML
GM		OL
GC		CH
SW		MH
SP		OH
SW-SM		PT
SP-SM		



NOTES

- Ground surface adapted from LiDAR data and should be considered approximate.
- This subsurface profile is generalized from materials observed in soil borings. Variations may exist between profile and actual conditions.
- Vertical datum is NAVD88.

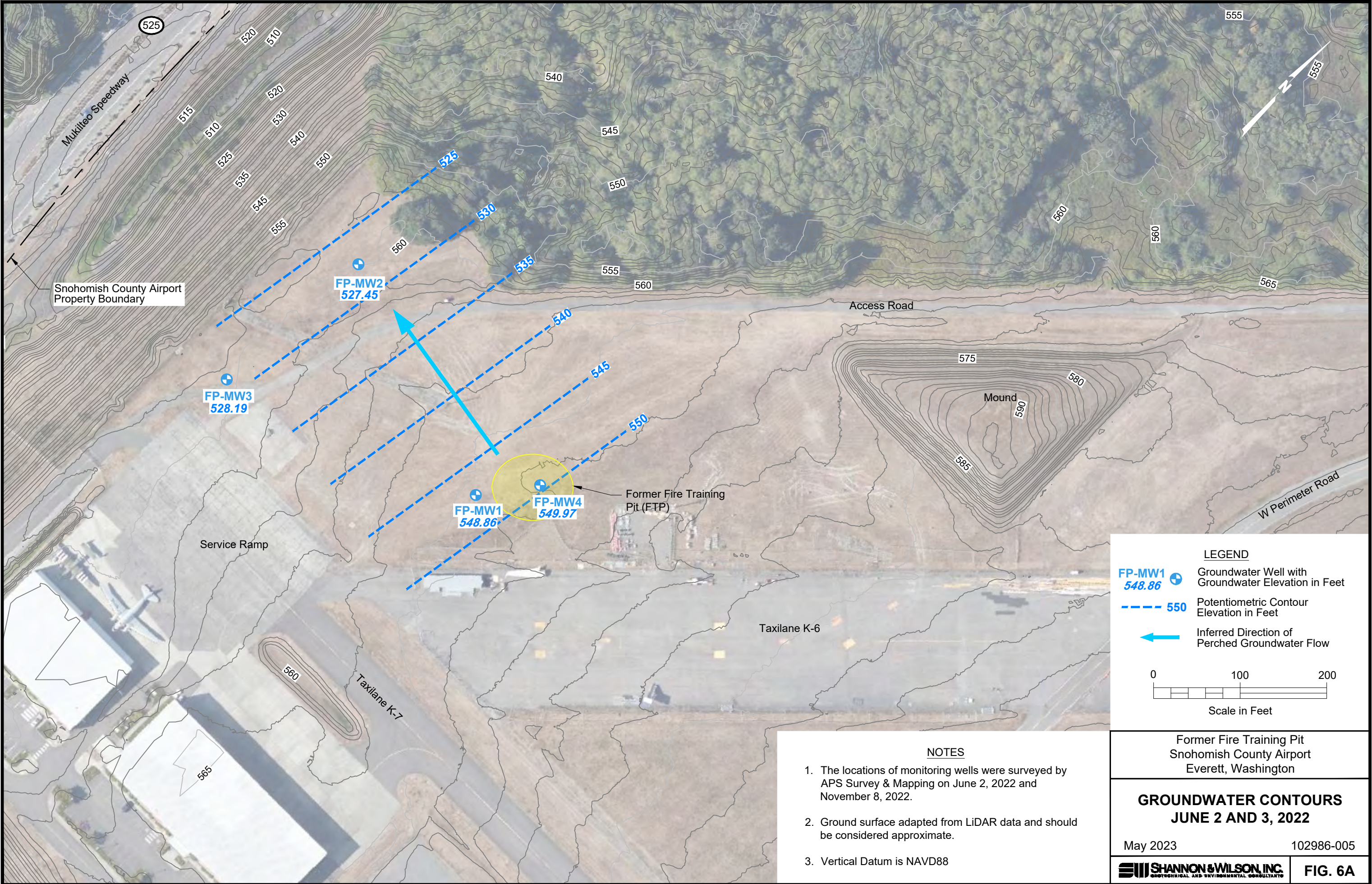


Former Fire Training Pit
Snohomish County Airport
Everett, Washington

GENERALIZED SUBSURFACE
PROFILE B-B'

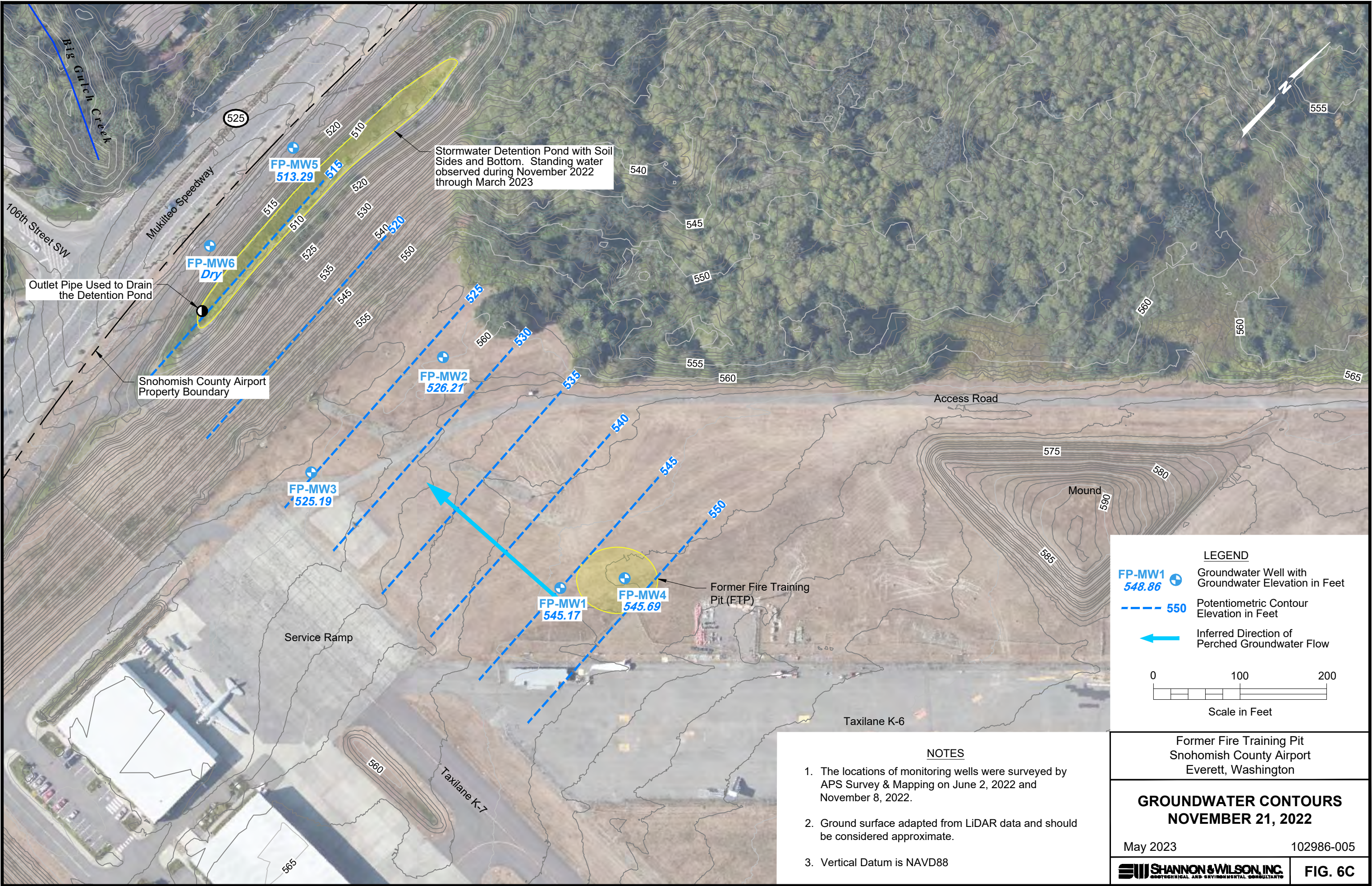
May 2023 102986-005

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Filename: C:\Users\jrs\CAD Group Dropbox\JDrive_SEA\102986\005\102986-005 Plan and Profiles-.dwg Layout: Figure 6C Date: 04-28-2023 Login: JRS

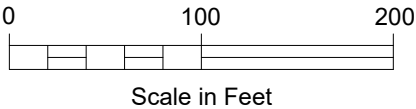


NOTES

1. The locations of monitoring wells were surveyed by APS Survey & Mapping on June 2, 2022 and November 8, 2022.
2. Ground surface adapted from LiDAR data and should be considered approximate.
3. Vertical Datum is NAVD88

LEGEND

- FP-MW1 548.86 Groundwater Well with Groundwater Elevation in Feet
- 550 Potentiometric Contour Elevation in Feet
- ← Inferred Direction of Perched Groundwater Flow



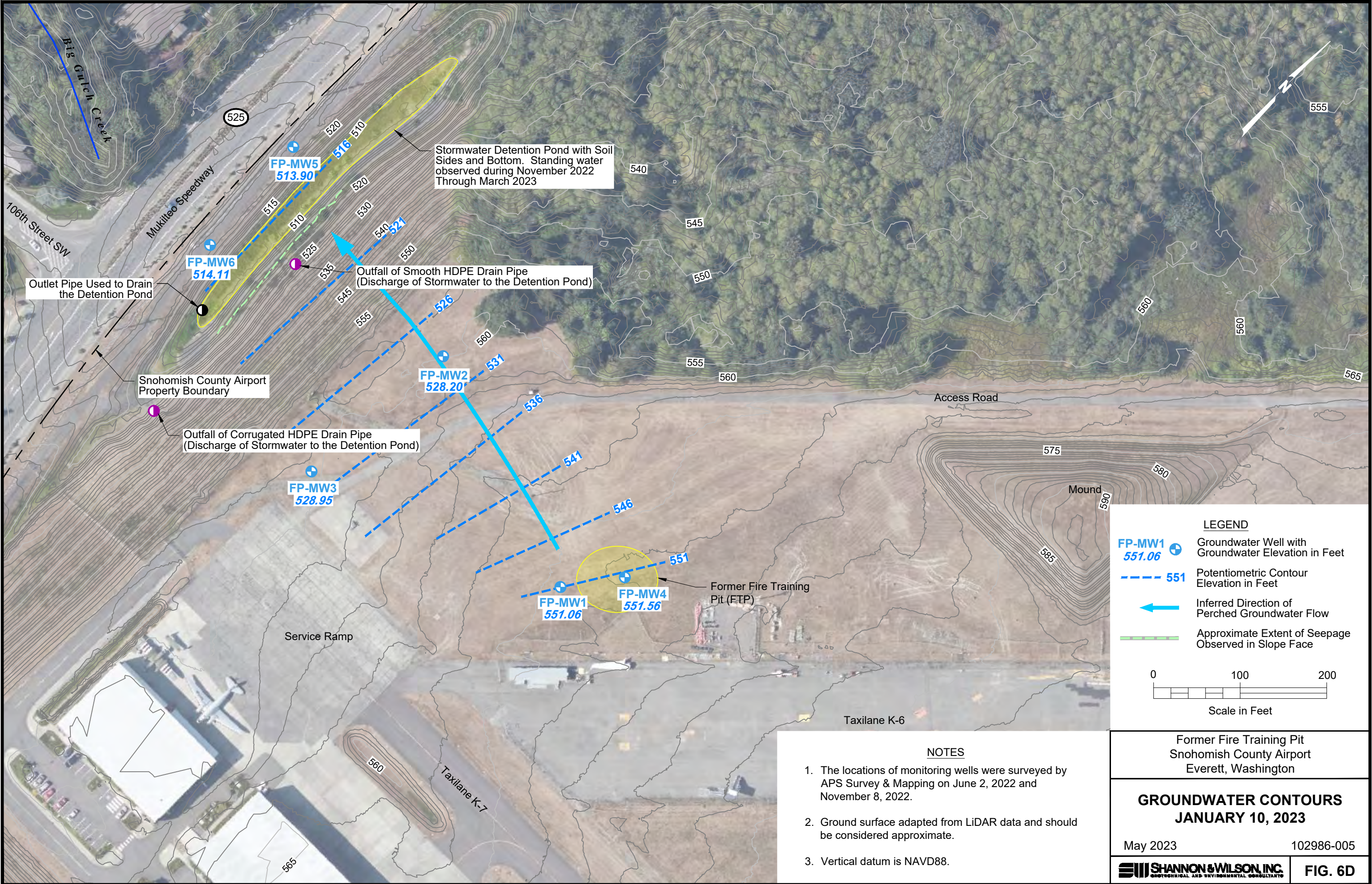
Former Fire Training Pit
Snohomish County Airport
Everett, Washington

GROUNDWATER CONTOURS
NOVEMBER 21, 2022

May 2023 102986-005

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GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6C



LEGEND

FP-MW1 551.06 Groundwater Well with Groundwater Elevation in Feet

--- 551 Potentiometric Contour Elevation in Feet

Inferred Direction of Perched Groundwater Flow

Approximate Extent of Seepage Observed in Slope Face

0 100 200
Scale in Feet

- NOTES**
1. The locations of monitoring wells were surveyed by APS Survey & Mapping on June 2, 2022 and November 8, 2022.
 2. Ground surface adapted from LiDAR data and should be considered approximate.
 3. Vertical datum is NAVD88.

Former Fire Training Pit
Snohomish County Airport
Everett, Washington

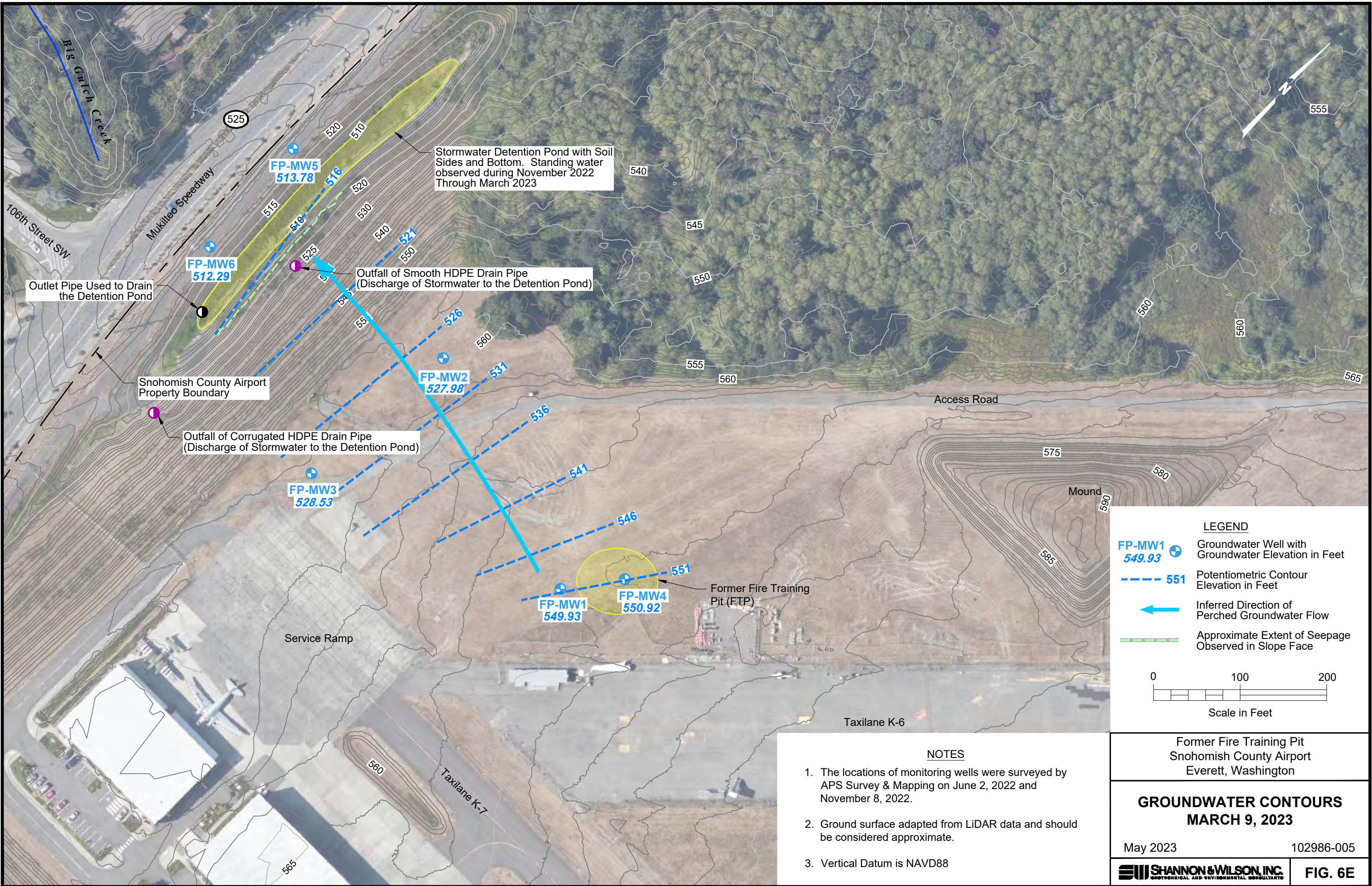
**GROUNDWATER CONTOURS
JANUARY 10, 2023**

May 2023 102986-005

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FIG. 6D

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LEGEND

FP-MW1

549.93

Groundwater Well with Groundwater Elevation in Feet

551

Potentiometric Contour Elevation in Feet

Inferred Direction of Perched Groundwater Flow

Approximate Extent of Seepage Observed in Slope Face

0

100

200

Scale in Feet

- NOTES
1.

The locations of monitoring wells were surveyed by APS Survey & Mapping on June 2, 2022 and November 8, 2022.
2.

Ground surface adapted from LiDAR data and should be considered approximate.
3.

Vertical Datum is NAVD88

Former Fire Training Pit
Snohomish County Airport
Everett, Washington

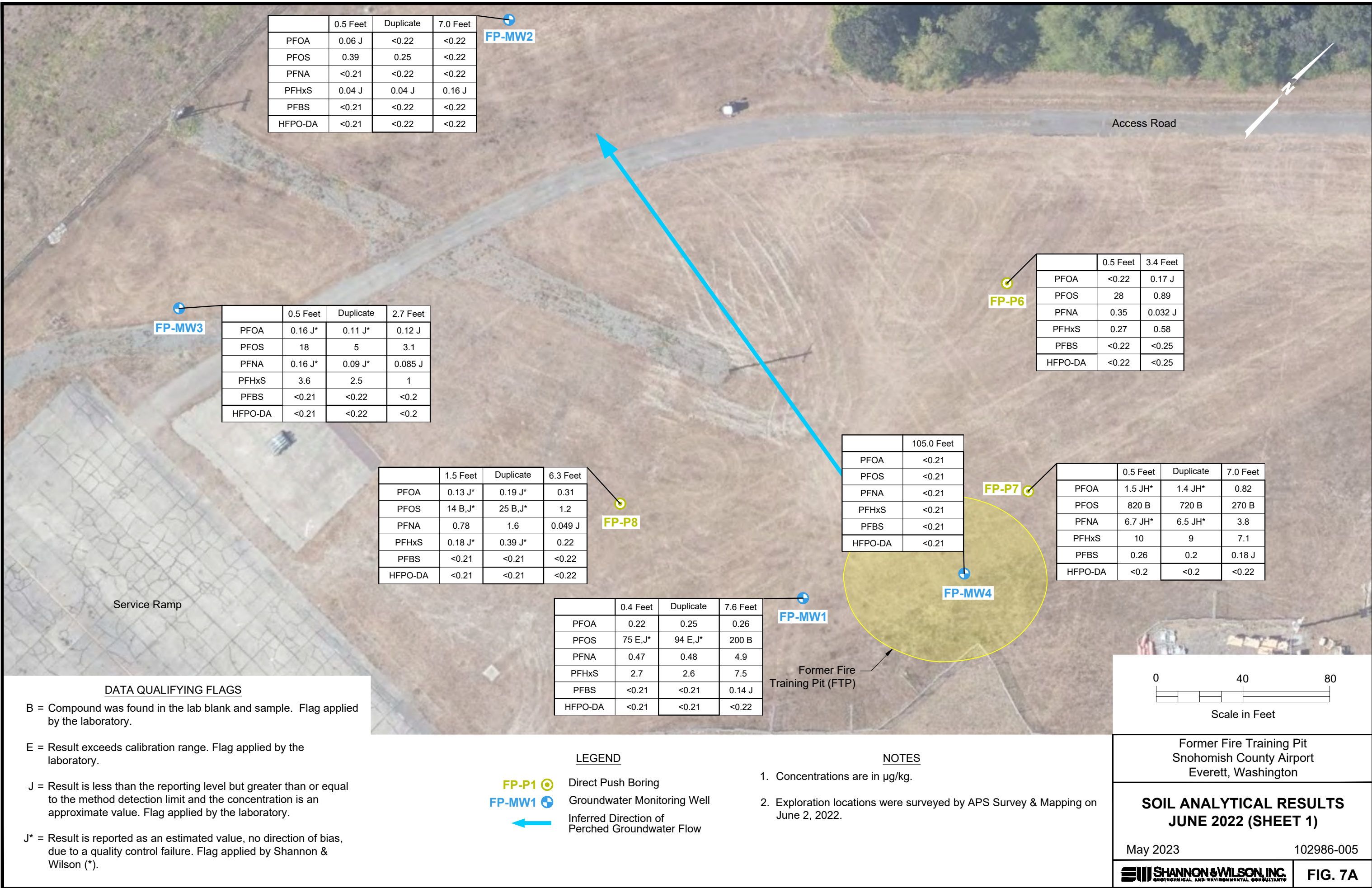
GROUNDWATER CONTOURS
MARCH 9, 2023

May 2023102986-005

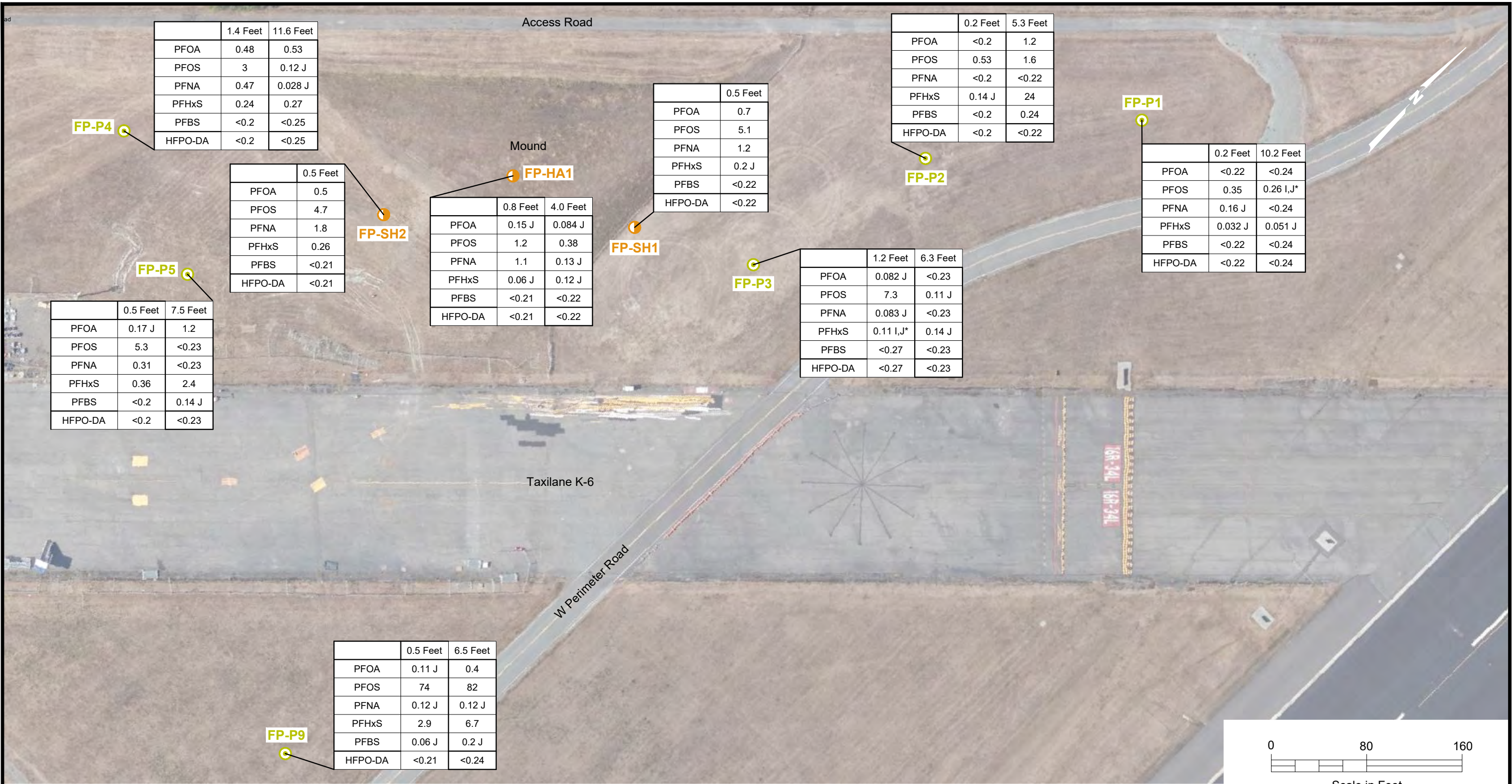
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FIG. 6E

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Filename: C:\Users\jrs\CAD Group Dropbox\JDrive_SEA\102986\005\102986-005 Soil Analyticals-.dwg Layout: Figure 7B Date: 04-28-2023 Login: JRS



DATA QUALIFYING FLAGS

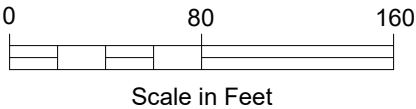
- I = Value is an estimated maximum possible concentration. Flag applied by the laboratory.
- J = Result is less than the reporting level but greater than or equal to the method detection limit and the concentration is an approximate value. Flag applied by the laboratory.
- J* = Result is reported as an estimated value, no direction of bias, due to a quality control failure. Flag applied by Shannon & Wilson (*).

LEGEND

- FP-P1** Direct Push Boring
- FP-HA1** Shovel or Hand Auger Exploration

NOTES

1. Concentrations are in µg/kg.
2. Exploration locations were surveyed by APS Survey & Mapping on June 2, 2022.



Former Fire Training Pit
Snohomish County Airport
Everett, Washington

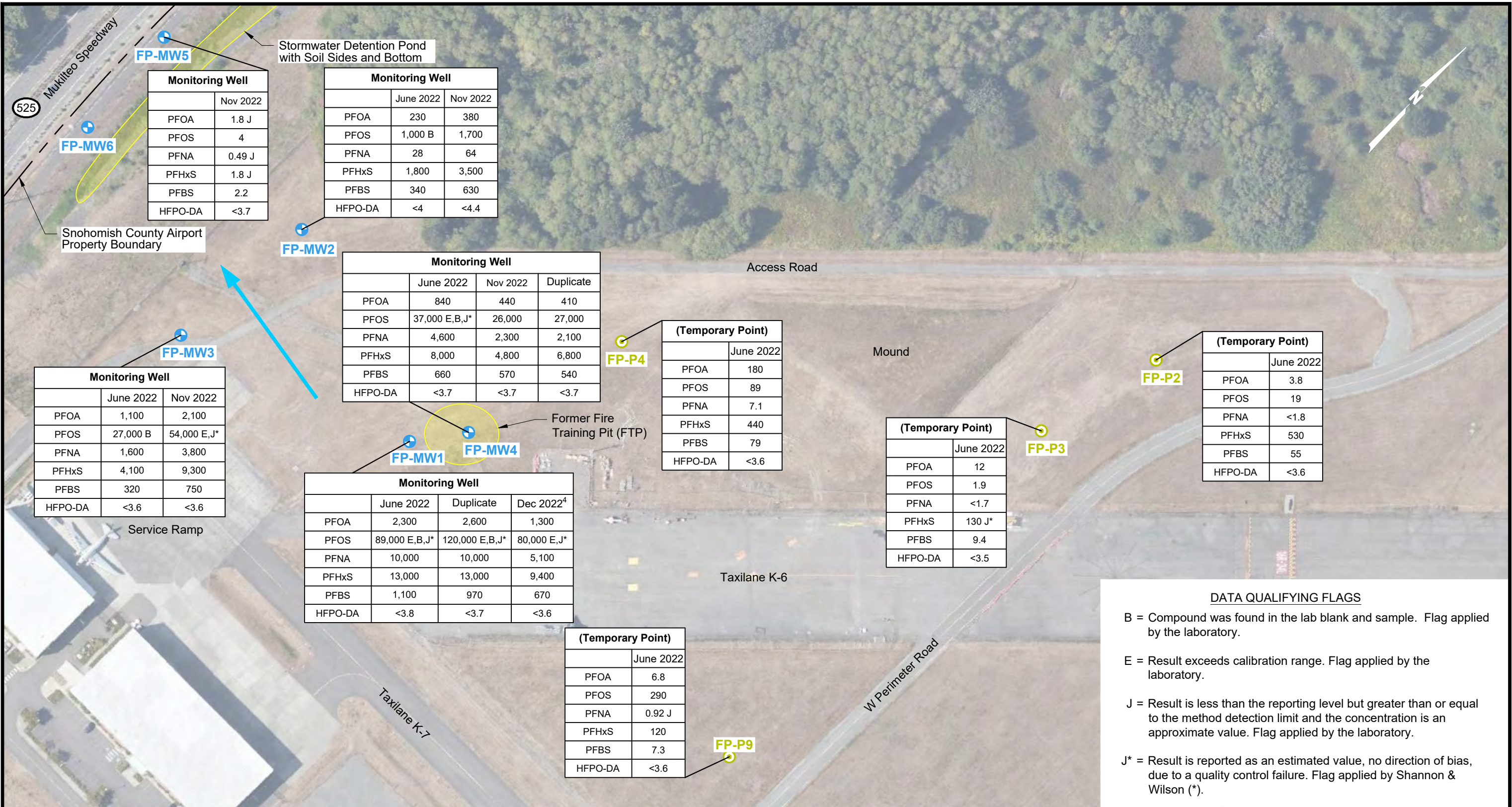
SOIL ANALYTICAL RESULTS
JUNE 2022 (SHEET 2)

May 2023 102986-005

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GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 7B

Filename: C:\Users\jrs\CAD Group Dropbox\JD\drive\SEA\102986\005\102986-005 GW Analyticals-.dwg Layout: Figure 8 Date: 05-02-2023 Login: JRS



NOTES

- Concentrations are in ng/L.
- Exploration locations were surveyed by APS Survey & Mapping on June 2, 2022.
- Well FP-MW1 was not sampled in November 2022 due to low recharge rate. FP-MW1 was sampled in December 2022.

LEGEND

- FP-P1 Direct Push Boring
- FP-MW1 Groundwater Monitoring Well
- Inferred Direction of Perched Groundwater Flow



Former Fire Training Pit
Snohomish County Airport
Everett, Washington

**GROUNDWATER
ANALYTICAL RESULTS
JUNE AND NOVEMBER 2022**

May 2023 102986-005

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FIG. 8

Appendix A

2007 Soil Remediation Summary Report

CONTENTS

- Soil Remediation Summary Report, FTP, Snohomish County Airport, Everett, Washington: prepared by CDM, Bellevue, Wash., CDM project no. 19947-54348, for Snohomish County Department of Public Works, Everett, Wash., February 26, 2007.

**Soil Remediation Summary Report
Former Fire Pit
Snohomish County Airport
Everett, Washington**

February 26, 2007

Prepared For:

Snohomish County Department of Public Works
3000 Rockefeller, M/S 607
Everett, Washington 98201-4046

Prepared By:

CDM

11811 NE 1st Street, Suite 201
Bellevue, Washington 98005

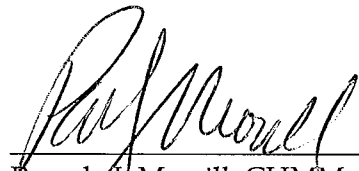
CDM Project No. 19947-54348

A Report Prepared For:

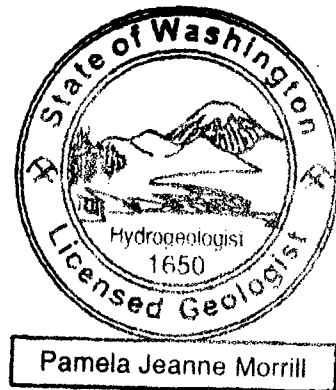
Snohomish County Department of Public Works
3000 Rockefeller, M/S 607
Everett, Washington 98201-4046

**SOIL EXCAVATION SUMMARY REPORT
FORMER FIRE PIT
SNOHOMISH COUNTY AIRPORT
EVERETT, WASHINGTON**

February 26, 2007



Pamela J. Morrill, CHMM, LHG
Project Manager



CDM

11811 N.E. 1st Street, Suite 201
Bellevue, Washington 98005
(425) 453-8383

CDM Project No. 19947-54348

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1.3	Purpose and Scope of Services	1-1
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Figure 2	Site and Vicinity Map
Figure 3	Pre-Excavation Sample Location Map
Figure 4	Excavation and Sample Location Map
Figure 5	Comparison of Lead Concentrations for XRF vs Lab Analysis

Section 1

Introduction

1.1 General

This report summarizes soil remediation activities conducted at the former fire pit (site or subject property) located at Snohomish County Airport (SCA) in Everett, Washington (**Figure 1**). Snohomish County retained Camp Dresser & McKee Inc. (CDM) to perform remedial actions under Master Agreement No. OC06/2-5(F), Work Authorization No. 10 and in accordance with our August 23, 2006 proposal.

1.2 Site Location and Description

The site, located at the southwest corner of SCA, was used by the SCA Fire Department for training exercises. **Figure 1** shows the site location. The fire pit was an approximately 40 foot by 80 foot oval earthen depression within a generally level grassy area adjacent to the northeast-southwest trending Taxiway K-5. **Figure 2** shows the approximate layout of the former fire pit with respect to Taxiway K-5.

1.3 Purpose and Scope of Services

The purpose of this work was to remove and appropriately dispose of soil contaminated with petroleum hydrocarbons and lead. The scope of work consisted of the following:

- Excavating petroleum hydrocarbon and lead-contaminated soils.
- Field screening lead concentrations in soils during excavation activities using an X-Ray Fluorescence (XRF) meter.
- Collecting soil samples from the excavation limits for confirmation analyses.
- Analyzing collected soil samples for total petroleum hydrocarbons quantified as diesel and oil (TPH-D and TPH-O, respectively) and total lead.
- Properly abandoning an existing monitoring well located adjacent to the fire pit.
- Disposing of excavated soils at a RCRA Subtitle D solid waste landfill.
- Backfilling the excavation to preexisting grade.
- Preparing this report summarizing the work, field observations, and chemical testing results. Summary tables, figures, photographs, laboratory reports, and waste disposal receipts are also provided.

1.4 Report Presentation

The following sections detail our investigation methods and findings. Section 2.0 describes the environment of the site area, including the subsurface geology and hydrology. Section 3.0 summarizes previous investigation results by CDM and another consultant and establishes site cleanup levels. The scope and methods of remediation activities, field screening, and laboratory analyses are described in Section 4. The final cleanup actions and results of the confirmation analyses are discussed and evaluated in Section 5.0. Conclusions and recommendations are presented in Section 6.0

Section 2

Environmental Setting

2.1 Setting

The fire pit, which had been used by SCA Fire Department for training purposes, was an approximately 40 foot by 80 foot oval earthen depression about 1 to 2 feet deep (**Figures 2 and 3**). It was located within a generally level grassy area adjacent to the northeast-southwest trending Taxiway K-5. Taxiway K-6 and a service ramp are located about 200 feet to the south of the fire pit. The site and immediate site vicinity are currently being developed for aviation-related commercial and industrial use. At the time of this work, large soil stockpiles had been placed just to the north of the fire pit in preparation of the development.

2.2 Regional Geology

SCA is located within the Puget Sound Lowland on an upland glacial terrain feature known as the Intercity Plateau. The Intercity Plateau is a depositional feature of the Vashon glaciation with incised ravines eroded into its perimeter. The Plateau ranges in elevation from approximately 400 to 600 feet above mean sea level (MSL) and is characterized by low rolling hills. Glacial till and recessional glacial deposits generally mantle the plateau, although isolated areas of recent age peat are mapped south and east of SCA. SCA itself is generally constructed on glacial till and reworked native sediments.

2.3 Site Geology

CDM (formerly AGI Technologies) explored subsurface conditions in the general site vicinity during a 1998 environmental assessment and a concurrent geotechnical investigation by drilling nine soil borings to depths ranging from 16.5 to 45.3 feet below ground surface (ft bgs) (AGI, 1998a, AGI 1998b). Based on conditions encountered, along with our review of a previous investigation performed around the site (Dames & Moore, 1989), we characterized subsurface soils as follows.

Upper Fill: The Upper Fill is variable in consistency and is generally composed of very loose to loose, moist to wet silty sand with some gravel, cobbles and occasional organics and wood debris. We interpreted the Upper Fill to consist of reworked native glacial till deposits, possibly mixed with construction rubble and grubbings. In several cases, the Upper Fill was composed of loosely placed, partially cemented till fragments. Upper Fill was encountered in all nine borings beginning at the ground surface and ranging from 16 to 24 ft bgs.

Lower Fill: The Lower Fill is also variable in consistency and is composed of loose to medium dense, saturated silty sand with some gravel, and cobbles, but with less organics and wood debris than observed in the Upper Fill. Lower Fill was encountered underlying the Upper Fill in all of our borings and ended at depths between approximately 19 and 42 ft bgs.

Till: The Till is a native soil deposit composed of dense to very dense, moist to wet sand and silty sand with some gravel and cobbles and occasional lenses of clean sand. Both weathered and unweathered Till was encountered below the Lower Fill at depths between 19 and 42 ft bgs.

2.4 Groundwater

Perched groundwater occurs within the Lower Fill on top of the native Till deposits. During the prior investigations, groundwater was encountered at depths ranging between approximately 12.5 and 24 ft bgs. We expect the groundwater level fluctuates seasonally in response to precipitation. We estimate the flow direction of perched groundwater across the site is west, based upon topography.

The uppermost aquifer at SCA occurs under unconfined (water table) conditions within the Advance Outwash (Qva aquifer). Information for this area of Paine Field suggests that groundwater is under confined conditions and that the static elevation is about 290 to 350 feet MSL, or about 180 to 240 ft bgs (CDM, 2000; Thomas, et. al., 1997).

2.5 Surface Water Drainage

The site and immediate vicinity topography generally slopes from east to west; which we expect is also the general direction of surface water runoff.

Section 3

Contaminant Delineation and Site Cleanup Levels

In September 1989, Dames & Moore completed a contamination and geotechnical assessment for the fire pit and general site area (Dames & Moore, 1989). Their investigation identified petroleum hydrocarbons and metals in a surface water sample collected from the pit. Also, hydrocarbons were detected in a 5.5-foot deep soil sample collected from a boring located within the fire pit.

To follow up Dames & Moore's investigation, CDM, formerly AGI Technologies, conducted an assessment of the fire pit in early 1998 (AGI, 1998b). In January 1998, CDM drilled three borings around the edge of the fire pit, installed a shallow monitoring well in one of the borings, and collected subsurface soil samples from drilled borings, surface soil samples from within and outside of the fire pit, a groundwater sample, and a surface water sample from the pit for chemical analysis. Subsurface samples could not be collected from within the fire pit during CDM's investigation due to the presence of standing water. **Figure 3** shows the historical surface soil sample, boring, and monitoring well locations.

Soil samples were analyzed for TPH-D and TPH-O and total arsenic, cadmium, chromium, lead, and mercury (with the exception of the outer perimeter samples where the only metal analyzed was lead). Soil sample data are summarized in **Table 1**. The groundwater and surface water samples were analyzed for hydrocarbons and metals as described above, plus volatile organic compounds (VOCs).

At the time of CDM's 1998 investigation, the Model Toxics Control Act (MTCA) Method A soil cleanup level for diesel and oil range petroleum hydrocarbons was 200 milligrams per kilogram (mg/kg). Soils exceeding this cleanup level extended throughout the fire pit and about 10 to 20 feet beyond the fire pit on the southwest and northwest sides (probably from overflow). Lead concentrations also exceeded the MTCA Method A cleanup level of 250 mg/kg at several locations. Subsurface soil samples were not found to exceed any of the cleanup levels during CDM's investigation. The surface water sample contained a cutting oil-like petroleum product. For the groundwater sample, petroleum and VOCs were not detected and metals concentrations were below regulatory limits.

In 2001, the MTCA Method A soil cleanup levels for diesel and oil range petroleum hydrocarbons were revised to 2,000 mg/kg. This change reduced the amount of soil exceeding MTCA Method A cleanup levels for petroleum hydrocarbons by one quarter to one third the amount as compared to the old standards. The Method A cleanup level for lead has not changed.

The 2001 revisions to MTCA also require that existing or potential threats to terrestrial plants or animals exposed to hazardous substances be evaluated. The assessment must determine whether the site is: 1) excluded from the terrestrial ecological evaluation (TEE), 2) qualified for a simplified TEE, or 3) must undergo a site-specific TEE. This site and the immediate site vicinity are currently being developed for aviation-related commercial and industrial use. There is less than 1.5 acres of contiguous undeveloped land within 500 feet of any area of the site affected by hazardous substances and within the next one to three years the site will be covered by physical barriers such as pavement and buildings. Therefore, the site qualifies for the TEE exclusion.

To avoid any land use restrictions, the Method A cleanup levels of 2,000 mg/kg for TPH-D and also TPH-O, and 250 mg/kg for total lead were established as the cleanup standards for this site.

Section 4

Remedial Actions

CDM's remedial activities occurred on September 18 and 19, 2006. Site work consisted of excavating contaminated soils, digging four test pits to check soil conditions at depth, field screening for hydrocarbons and lead, collecting and analyzing soil samples from the excavation limits and test pits, backfilling with clean fill, disposing of excavated soils, and abandoning the monitoring well. Photographs taken during site work are included in **Appendix A**.

4.1 Soil Excavation and Test Pits

Methods

Soil was excavated using a track-mounted excavator. CDM field staff observed excavation and conducted field screening to evaluate the limits of contamination. Excavation limits are shown on **Figure 4**. Excavated soils were temporarily stockpiled on polyethylene sheeting and covered with polyethylene sheeting. The excavation depth was approximately one foot throughout.

Four test pits (TP-A through TP-D) were also excavated in the former fire pit to depths between 5.5 and 9 ft bgs in order to evaluate whether subsurface soil had been impacted by petroleum hydrocarbons. Soils were examined and field screened throughout the test pit excavation. Soil in TP-B at a depth of 5.5 ft bgs contained a slight petroleum odor. TP-D, which was dug to a depth of 9 ft bgs adjacent to TP-B, contained no petroleum odor.

Field Screening

The potential presence/absence of petroleum hydrocarbons was monitored throughout excavation activities by visual and olfactory inspection, and the use of an organic vapor meter equipped with a photoionization detector (OVM-PID) to check for the presence of volatile and semi-volatile range petroleum hydrocarbons. OVM-PID screening is conducted by placing a representative portion of each sample into a resealable plastic bag and disaggregating the material. The relative VOC concentration is then measured in the headspace using the OVM-PID. This is not a compound-specific analysis and is affected by, among other influences, climate (e.g., temperature and humidity), soil type and conditions, instrument calibration and operation, and type of organic compounds present. Because residual hydrocarbons present at the site were weathered and non-volatile in nature, this method of field screening was found to be a poor indicator of the presence of hydrocarbons.

In situ lead concentrations were screened throughout field activities using an Innov-X Systems brand field portable X-Ray Fluorescence (XRF) spectrometer. XRF testing was conducted in general accordance with EPA method 6200. In situ XRF screening simply involves operating the machine in direct contact with the soil. Preparation for surface soil sampling consisted of scraping off any vegetation over the soil and leveling the area so the XRF window rests level on the soil surface. A 90 second time

interval was used. Lead concentrations were found to range as high as 1,800 parts per million (ppm). Any soils determined to exceed 250 ppm were excavated.

4.2 Performance Sampling

Performance sampling included both the collection of soil samples for laboratory analysis and in situ XRF samples. Soil samples to be submitted for laboratory analysis were collected into 4-ounce laboratory grade glass jars, sealed, labeled, and placed into a chilled cooler. Prior to submittal, the sample lead concentration was screened using the XRF in order to later compare the XRF and laboratory analytical data. Samples were then transported under chain-of-custody protocol to CCI Analytical Laboratories Inc. (CCI) in Everett, Washington. CCI's analytical reports are included in **Appendix B**. The various sampling methodologies are described in the following sections.

4.2.1 Stockpile

One composite soil sample was collected from the stockpile for waste designation purposes. The composite stockpile sample was analyzed for petroleum hydrocarbons by NWTPH-Dx and for leachable metals (RCRA 8 metals) by EPA Methods 1311/6010/7470.

4.2.2 Excavations

A total of 21 discrete samples from the excavation base and outlying area were used to confirm the success of remedial actions. Sample locations are shown on **Figure 4**. Eleven of these soil samples (CS-1 through CS-11) were submitted for laboratory analysis. These samples were analyzed for total diesel and oil range petroleum hydrocarbons by Northwest Method NWTPH-Dx and total lead by EPA Method 6010. Ten discrete XRF readings (X-7 through X-16), taken at the end of excavation activities, were also used as confirmation samples.

4.2.3 Test Pits

One soil sample was collected at the base of each test pit between depths of 5.5 and 9 ft bgs (see **Table 2**). TP-D was excavated adjacent to TP-B in an effort to delineate the depth of apparent hydrocarbons identified in TP-B. The test pit was ended at 9 feet and a sample was collected. Each sample was analyzed for total diesel and oil range petroleum hydrocarbons by Northwest Method NWTPH-Dx.

4.3 Soil Disposal

Excavated soils were transported by truck in railroad car containers to Regional Disposal Company's (Rabanco) Everett transfer station on January 3 and 4, 2007. The soil was then transported by rail to Rabanco's Roosevelt Regional Landfill in Roosevelt, Washington. These soils were transported in conjunction with lead-contaminated soils that were excavated from the former Sheriff's Pistol Range at Paine Field. Therefore, the exact tonnage that came from the Fire Pit is not available. An

estimated 170 cubic yards or 250 tons of soil were removed from the former fire pit area.

4.4 Backfilling

The excavation was filled with clean sandy backfill obtained from another Paine Field location and the area was graded level.

4.5 Well Abandonment

On September 20, 2006, Boart Longyear abandoned the existing monitoring well (MW1) located adjacent to the fire pit. The well was constructed with 4 inch diameter PVC well casing and extended to a depth of 23 ft bgs. The well was abandoned by removing the standup monument, cutting the PVC well casing to below land surface, and filling the well casing with bentonite chips.

Section 5

Cleanup Summary

Contamination, which extended throughout and beyond the edges of the southwestern half of the former fire pit was excavated. When the work in this area concluded, the excavation measured approximately 60 feet long by 50 feet wide and 1 foot deep as shown on **Figure 4**. During XRF screening, additional lead contaminated-soil was identified in a portion of the northern half of the fire pit. Therefore, additional excavation occurred over an area approximately 22 feet long by 8 feet wide and 1 foot deep, as shown on **Figure 4**.

Soil analytical data are summarized in **Table 2**. TPH-D was detected in seven of the eleven confirmation samples, ranging between 44 mg/kg and 600 mg/kg, all below the Method A cleanup level of 2,000 mg/kg. TPH-O was detected in all but one of the samples, ranging from 64 mg/kg to 800 mg/kg, again, all below the Method A cleanup level of 2,000 mg/kg. Chromatograms indicated that the samples typically contained two or more types of hydrocarbons, including possibly diesel, Bunker C, and lube oil. In some instances, overlap of the various hydrocarbons may bias the analytical data high. Most of the hydrocarbons appear quite weathered. The weathering and multiple types of hydrocarbon products are expected, given the nature of historical activities at the fire pit.

For samples CS-1 through CS-11, total lead, as reported by the analytical lab, was detected in all samples, ranging between 5 mg/kg and 220 mg/kg, with the average concentration being 86 mg/kg. The XRF data for the CS-1 through CS-11 samples showed detectable concentrations of lead in ten of the samples, ranging from 26 ppm and 188 ppm. The detection limit of the XRF ranged between approximately 11 ppm and 14 ppm. The average concentration of the XRF samples was 71 ppm. **Figure 5** shows the correlation between the XRF and analytical data, in which the coefficient of correlation $r=0.886$.¹

For XRF samples X-7 through X-16, lead concentrations ranged between 23 ppm and 155 ppm, with an average concentration of 65 ppm.

In the test pits, TPH-D and TPH-O were detected at a depth of 5.5 ft bgs in TP-B at concentrations of 55 and 98 mg/kg respectively. Hydrocarbons were not detected in any of the other test pit samples.

¹ A correlation coefficient is a number between -1 and 1 that measures the degree to which two variables are linearly related. If there is a perfect linear relationship with a positive slope between two variables, we have a linear relationship of 1. For example, if there is a positive correlation, whenever one variable is high, so is the other. If there is a perfect linear relationship with negative slope between two variables ($r = -1$) then there is a negative correlation. For example, one variable has a high value and the other has a low value.

Section 6

Conclusions and Recommendations

Residual hydrocarbon and total lead concentrations in site soils are below MTCA Method A cleanup levels in all confirmatory surface soil samples obtained within and outside of the remedial excavations. Samples collected at depth from test pits indicate that hydrocarbon migration to the subsurface is limited with no cleanup level exceedances. Based on the results of the confirmatory and exploratory sampling, CDM concludes that hydrocarbon and lead contamination have been remediated from this site in compliance with MTCA. No further actions are recommended.

Section 7

Limitations

This report was prepared for exclusive use of the Snohomish Department of Public Works and Snohomish County Airport for this project only. The analyses, conclusions, and recommendations in this report are based on conditions encountered at the time of our field investigation, design information you provided, and our experience and engineering judgement. CDM cannot be responsible for the interpretation by others of the data contained herein.

We must presume the conditions encountered are representative of the entire site. However, you should be aware that subsurface conditions may vary between exploration locations and with time, and unanticipated conditions can and do often occur.

Our work has been performed in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the area. No other warranty, express or implied, is made.

Section 8

References

AGI Technologies. 1998a. Preliminary Geotechnical Engineering Study, Proposed Kilo Ramp Development, Snohomish County Airport, Mukilteo, Washington. AGI Job Number 15,512.307. February 18.

AGI Technologies. 1998b. Contamination Assessment, Fire Pit, Snohomish County Airport, Snohomish County, Washington. AGI Job Number 15,512.306. May 11.

CDM. 2000. Hydrogeologic Setting, Paine Field Area, Everett, Washington. CDM Job No. 19947-29702-155122334. December 29.

Dames & Moore. 1989. Report, Contamination and Geotechnical Assessment, Fire Pit, Paine Field Everett, Washington. Prepared for the Boeing Company. Job No. 00605-016. September 15.

Ecology. 2001. Model Toxics Control Act Cleanup Regulation Chapter 173-340 WAC, Amended February 12, 2001. Washington State Department of Ecology. Publication No. 94-06, Amended February 12, 2001. Revised January 2003.

Thomas, B.E., Wilkinson, J.M. Embray, S.S. 1997. The Ground-Water System and Ground-Water Quality in Western Snohomish County. U.S. Geological Survey. Water Resources Investigation Report 96-4312.

Distribution

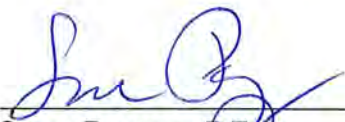
2 Copies Snohomish County Airport
3220 100th Street SW
Everett, Washington 98204

Attention: Mr. Andrew Rardin

2 Copies Washington State Department of Ecology
Northwest Region
3190 160th Ave. SE
Bellevue, Washington 98005-5452

Attention: Mr. Dale Myers

Quality Assurance / Technical Review by:



Susan Penoyar, P.E.
Associate

Tables

Table 1
Pre-Remediation Surface Soil Sample Analytical Summary
Former Fire Pit Soil Remediation
Snohomish County Airport
Everett, Washington

Sample I.D./ Location	TPH-D	TPH-O	Arsenic	Cadmium	Chromium	Lead	Mercury
	mg/kg						
<u>Pit Interior</u>							
Pit 1	670 J	860 J	1.4	0.93	21	41	ND
Pit 2	2,700 J	2,300 J	1.8	1.2	28	360	ND
Pit 3	1,100 J	1,600 J	1.9	1.5	24	86	0.09
Pit 4	470 J	1,100 J	1.4	1.6	20	500	ND
Pit 5	540 J	760 J	1.2	0.71	20	49	0.04
<u>Perimeter of Pit</u>							
Perim of Pit 1	590 J	770 J	1.8	0.87	19	640	ND
Perim of Pit 2	125 J	730 J	1.9	1.0	26	470	0.03
Perim of Pit 3	130 J	200 J	1.2	ND	17	49	ND
Perim of Pit 4	25 J	150 J	2.0	ND	19	42	0.03
Perim of Pit 5	220 J	1,000 J	2.3	0.95	16	240	0.03
Perim of Pit 20' #1	ND J	90 J	--	--	--	ND	--
Perim of Pit 20' #2	ND J	250 J	--	--	--	14	--
Perim of Pit 20' #5	ND J	86 J	--	--	--	110	--
Method Detection Limit	25	50	0.3	0.2	2	8	0.025
Cleanup Level ^a	2,000	2,000	20	2	100	250	1

Notes:

Samples collected January 1998. Ref: AGI Technologies. 1998. *Contamination Assessment, Fire Pit, Snohomish County Airport, Snohomish County, Washington. May 11, 1998.*

Boxed values exceed the Method A cleanup level.

a) Washington Administrative Code Chapter 173-340, Model Toxics Control Act Cleanup Regulation, Method A suggested soil cleanup level for unrestricted land uses; promulgated August 15, 2001.

J - Estimated value. Samples Perim of Pit 20' #1, #2, and #5 may be influenced by biogenic materials. TPH in all other samples affected by weathering.

TPH-d - Total petroleum hydrocarbons as diesel.

TPH-o - Total petroleum hydrocarbons as oil.

mg/kg - Milligrams per kilogram.



Table 2
Post Remediation Analytical Summary - Soil
Former Fire Pit Soil Remediation
Snohomish County Airport
Everett, Washington

Sample ID	Date Sampled	Sample Depth (ft bgs)	XRF Screening Lead (ppm)	Test Method		
				EPA 6010	NWTPH-Dx	
				Lead (mg/kg)	Diesel (mg/kg)	Oil (mg/kg)
CS-1	9/19/2006	surface	173	160	600	800
CS-2	9/19/2006	surface	63	110	190	240
CS-3	9/19/2006	surface	82	160	350	660
CS-4	9/19/2006	surface	188	220	370	700
CS-5	9/19/2006	surface	45	80	ND	65
CS-6	9/19/2006	surface	21	14	44	64
CS-7	9/19/2006	surface	63	27	55	170
CS-8	9/19/2006	surface	58	67	ND	66
CS-9	9/19/2006	surface	ND	5	73	72
CS-10	9/19/2006	surface	26	11	ND	99
CS-11	9/19/2006	surface	56	89	ND	ND
X-7	9/19/2006	surface	78	--	--	--
X-8	9/19/2006	surface	42	--	--	--
X-9	9/19/2006	surface	38	--	--	--
X-10	9/19/2006	surface	25	--	--	--
X-11	9/19/2006	surface	23	--	--	--
X-12	9/19/2006	surface	109	--	--	--
X-13	9/19/2006	surface	155	--	--	--
X-14	9/19/2006	surface	36	--	--	--
X-15	9/19/2006	surface	97	--	--	--
X-16	9/19/2006	surface	43	--	--	--
TP-A	9/18/2006	6.5	--	--	ND	ND
TP-B	9/18/2006	5.5	--	--	55	98
TP-C	9/18/2006	6.0	--	--	ND	ND
TP-D	9/18/2006	9.0	--	--	ND	ND
Detection Limit			11-14	0.72	25	50
Cleanup Level ^a			--	250	2,000	2,000

Notes:

a) Washington Administrative Code Chapter 173-340, Model Toxics Control Act Cleanup Regulation, Method A suggested soil cleanup level for unrestricted land uses; promulgated August 15, 2001.

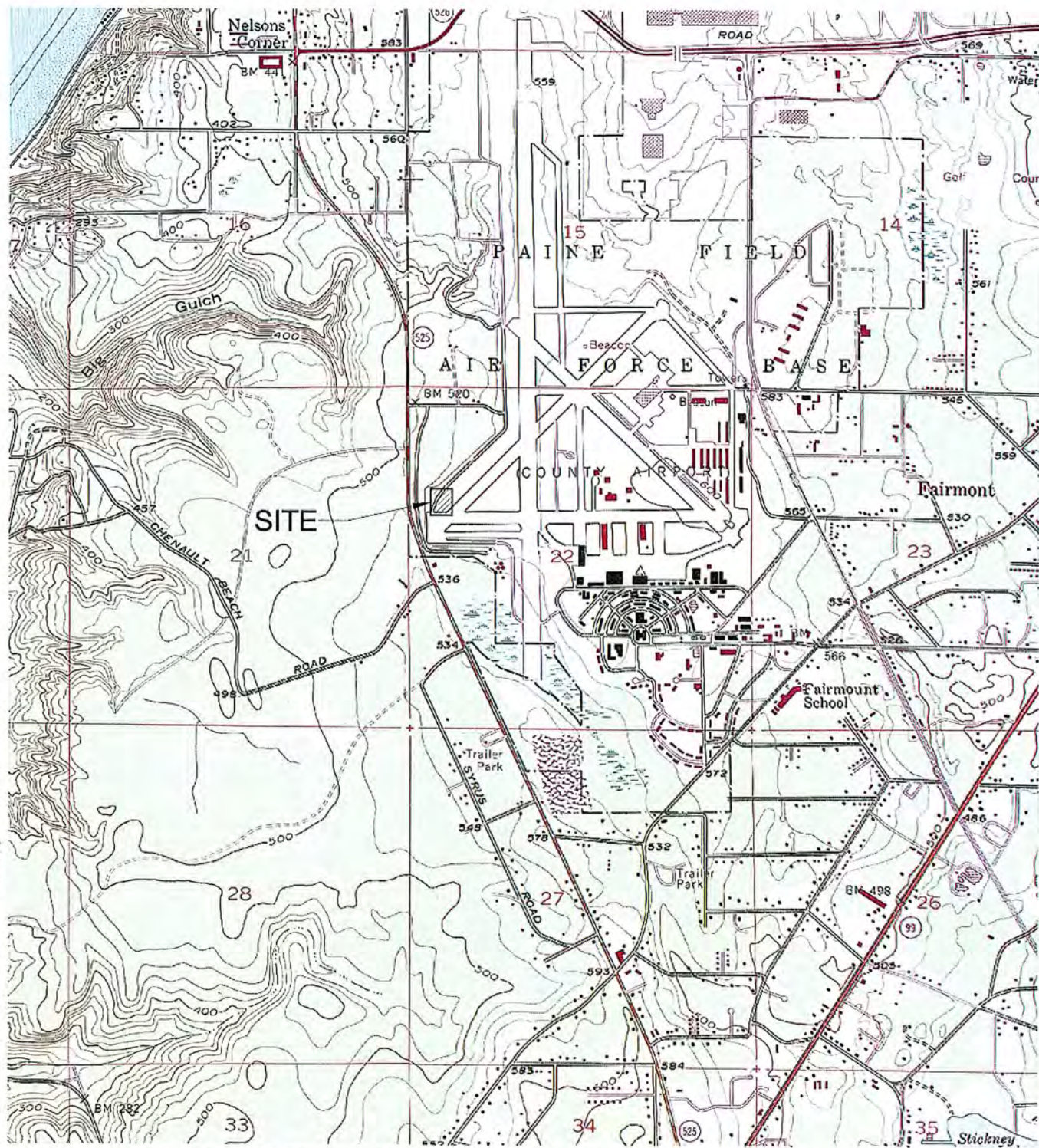
ND - not detected at or above detection limit.

ppm - parts per million.

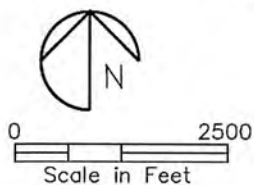
mg/kg - milligrams per kilogram (parts per million).

Figures

P:\19947\54348\Rept\ Fig-1 01/10/07 07:17 riehepj XREFS: 8X11BDR

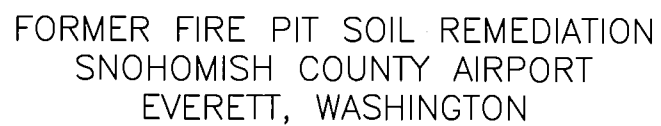


SOURCE: USGS MUKILTEO, WA - NE/4 EDMONDS 15' QUADRANGLE



FORMER FIRE PIT SOIL REMEDIATION
SNOHOMISH COUNTY AIRPORT
EVERETT, WASHINGTON

Figure No. 1
Location Map



 CATCH BASIN
 560 TOPOGRAPHIC CONTOUR
 (10 FOOT INTERVAL)

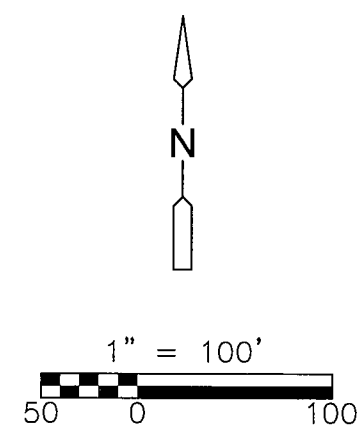


Figure No. 2
Site and
Vicinity Map

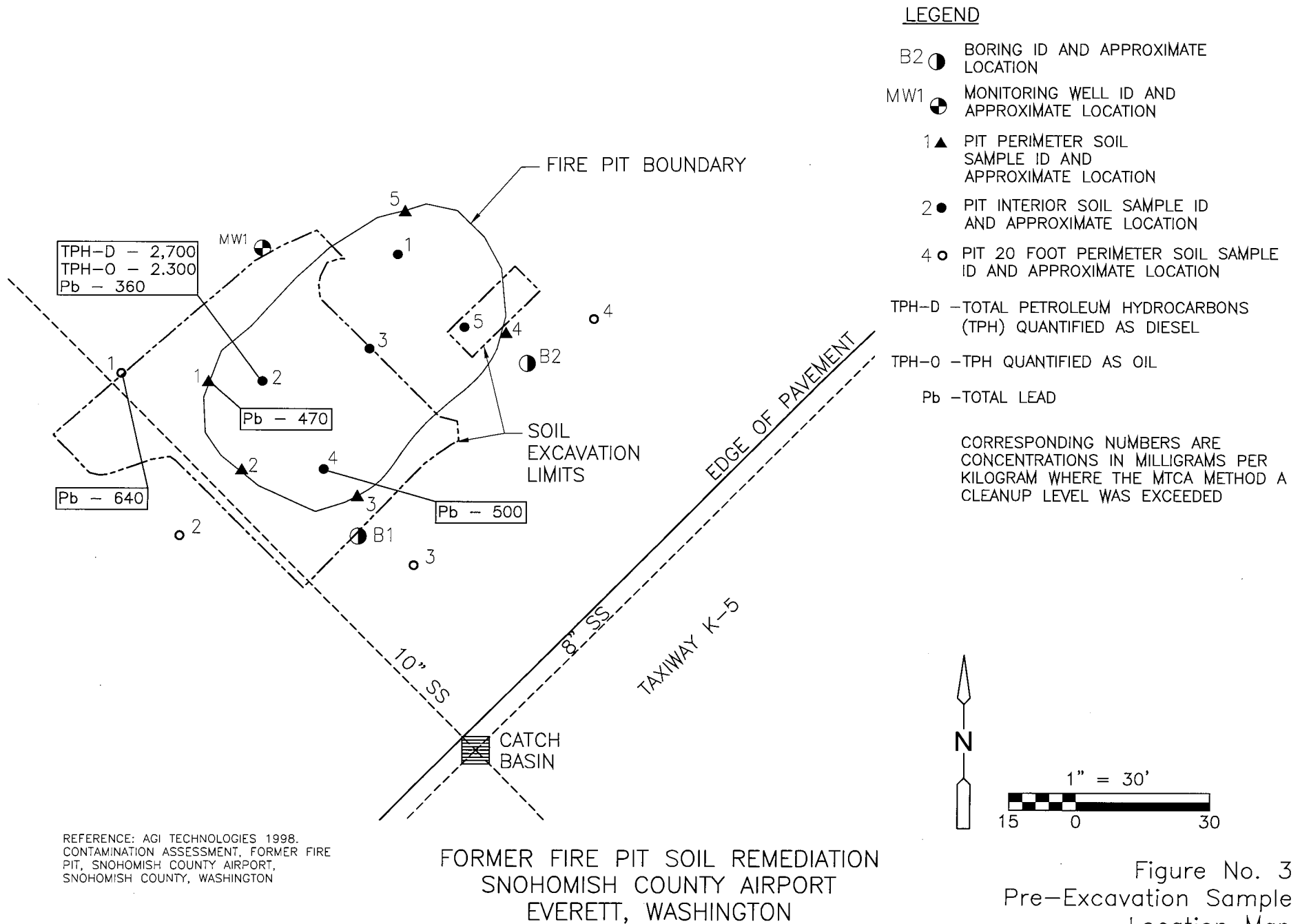


Figure No. 3
 Pre-Excavation Sample
 Location Map

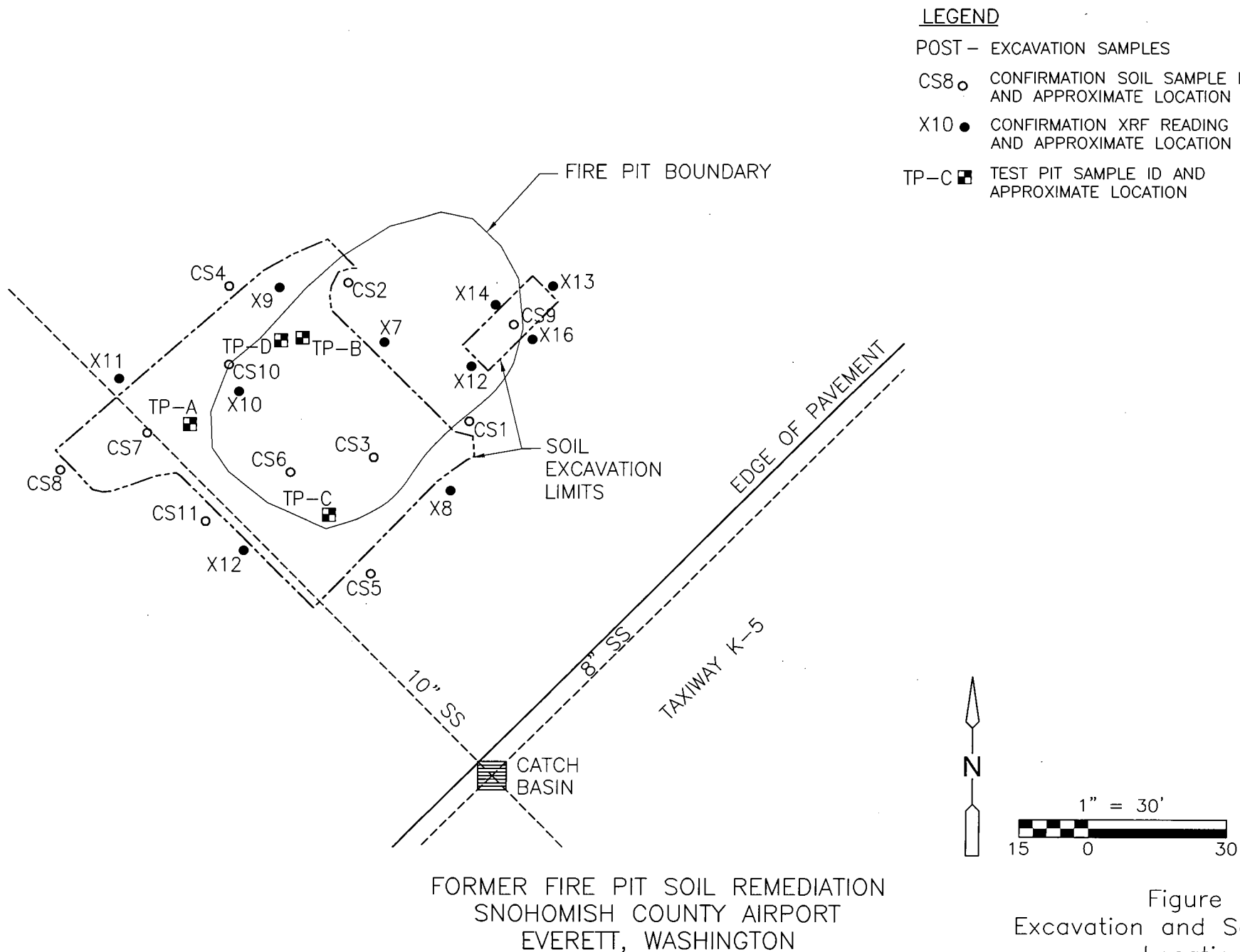
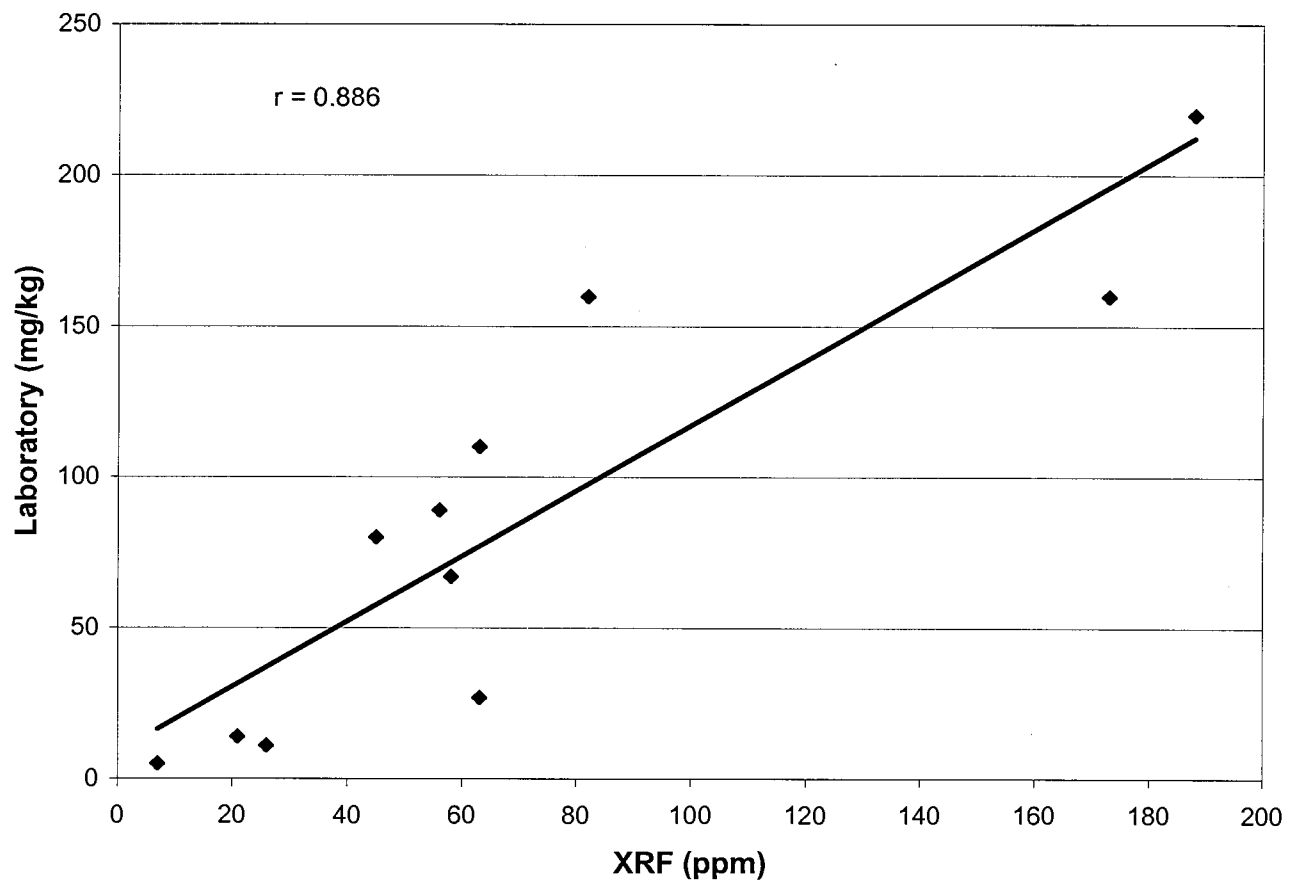


Figure No. 4
Excavation and Sample
Location Map



FORMER FIRE PIT SOIL REMEDIATION
SNOHOMISH COUNTY AIRPORT
EVERETT, WASHINGTON

Figure 5
Comparison of Lead Concentrations
for XRF vs Lab Analysis

Appendix A

Site Photographs

FIELD PHOTOGRAPHY LOG SHEET
Former Fire Pit Soil Remediation
Snohomish County Airport
Everett, Washington

September 18, 2006

Photograph No. 1

Photographed By:
Nick Simmons

Description: Excavating
soil.



September 18, 2006

Photograph No. 2

Photographed By:
Nick Simmons

Description: Excavation
with sample locations
flagged.



FIELD PHOTOGRAPHY LOG SHEET
Former Fire Pit Soil Remediation
Snohomish County Airport
Everett, Washington

September 18, 2006

Photograph No. 3

Photographed By:
Nick Simmons

Description: The smaller
excavation.

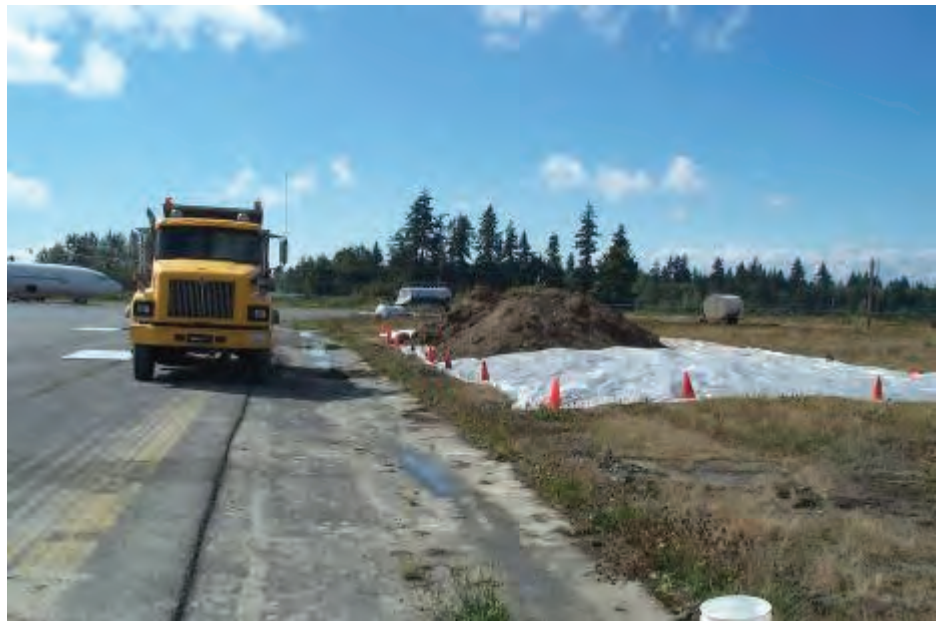


September 18, 2006

Photograph No. 4

Photographed By:
Nick Simmons

Description: Stockpiling
excavated soil.



FIELD PHOTOGRAPHY LOG SHEET
Former Fire Pit Soil Remediation
Snohomish County Airport
Everett, Washington

September 18, 2006

Photograph No. 4

Photographed By:
Nick Simmons

Description: Soil stockpile
waiting disposal.



Appendix B

Laboratory Analytical Reports



CCI
ANALYTICAL
LABORATORIES, INC

CERTIFICATE OF ANALYSIS

CLIENT: CAMP DRESSER & MCKEE, INC.
P.O. BOX 3885
BELLEVUE, WA 98009-3885

DATE: 9/19/2006
CCIL JOB #: 0609079
DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA
CLIENT SAMPLE ID: 9/18/2006 14:42 TP-A
CCIL SAMPLE #: -01

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX W/CLEANUP	ND(<25)	MG/KG	9/19/2006	DLC
TPH-Oil Range	NWTPH-DX W/CLEANUP	ND(<50)	MG/KG	9/19/2006	DLC

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

APPROVED BY:



CCI
ANALYTICAL
LABORATORIES, INC

CERTIFICATE OF ANALYSIS

CLIENT: CAMP DRESSER & MCKEE, INC.
P.O. BOX 3885
BELLEVUE, WA 98009-3885

DATE: 9/19/2006
CCIL JOB #: 0609079
DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA
CLIENT SAMPLE ID: 9/18/2006 14:48 TP-B
CCIL SAMPLE #: -02

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX W/CLEANUP	55	MG/KG	9/19/2006	DLC
TPH-Oil Range	NWTPH-DX W/CLEANUP	98	MG/KG	9/19/2006	DLC

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS EARLY DIESEL RANGE PRODUCT AND LUBE OIL

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

APPROVED BY:



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P.O. BOX 3885
BELLEVUE, WA 98009-3885

DATE: 9/19/2006
CCIL JOB #: 0609079
DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA
CLIENT SAMPLE ID: 9/18/2006 14:53 TP-C
CCIL SAMPLE #: -03

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX W/CLEANUP	ND(<25)	MG/KG	9/19/2006	DLC
TPH-Oil Range	NWTPH-DX W/CLEANUP	ND(<50)	MG/KG	9/19/2006	DLC

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

APPROVED BY:



CCI
ANALYTICAL
LABORATORIES, INC

CERTIFICATE OF ANALYSIS

CLIENT: CAMP DRESSER & MCKEE, INC.
P.O. BOX 3885
BELLEVUE, WA 98009-3885

DATE: 9/19/2006
CCIL JOB #: 0609079
DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA
CLIENT SAMPLE ID: 9/18/2006 15:34 TP-D
CCIL SAMPLE #: -04

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX W/CLEANUP	ND(<25)	MG/KG	9/19/2006	DLC
TPH-Oil Range	NWTPH-DX W/CLEANUP	ND(<50)	MG/KG	9/19/2006	DLC

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

APPROVED BY:



CCI
ANALYTICAL
LABORATORIES, INC

CERTIFICATE OF ANALYSIS

CLIENT: CAMP DRESSER & MCKEE, INC.
P.O. BOX 3885
BELLEVUE, WA 98009-3885

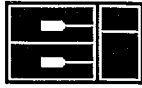
DATE: 9/19/2006
CCIL JOB #: 0609079
DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA

QUALITY CONTROL RESULTS

SURROGATE RECOVERY

CCIL SAMPLE ID	METHOD	SUR ID	% RECV
0609079-01	NWTPH-DX W/CLEANUP	C25	102
0609079-02	NWTPH-DX W/CLEANUP	C25	107
0609079-03	NWTPH-DX W/CLEANUP	C25	99
0609079-04	NWTPH-DX W/CLEANUP	C25	104



CCI
ANALYTICAL
LABORATORIES, INC

CERTIFICATE OF ANALYSIS

CLIENT: CAMP DRESSER & MCKEE, INC.
P.O. BOX 3885
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DATE: 9/19/2006
CCIL JOB #: 0609079
DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA

QUALITY CONTROL RESULTS

BLANK RESULTS

METHOD	MATRIX	QC BATCH ID	ASSOCIATED SAMPLES	ANALYTE	RESULT	UNITS
NWTPH-DX	Soil	DS091506	0609079 -01 to 03	TPH-Diesel Range	ND(<25)	MG/KG
NWTPH-DX	Soil	DS091506	0609079 -01 to 03	TPH-Oil Range	ND(<50)	MG/KG

CERTIFICATE OF ANALYSIS

CLIENT: CAMP DRESSER & MCKEE, INC.
P.O. BOX 3885
BELLEVUE, WA 98009-3885

DATE: 9/19/2006
CCIL JOB #: 0609079
DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

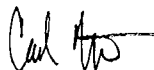
CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA

QUALITY CONTROL RESULTS

SPIKE/SPIKE DUPLICATE RESULTS

METHOD	MATRIX	QC BATCH ID	ASSOCIATED SAMPLES	ANALYTE	SPIKE RECOVERY	SPIKE DUP RECOVERY	RPD
NWTPH-DX	Soil	DS091506	0609079 -01 to 03	TPH-Diesel Range	99 %	103 %	4

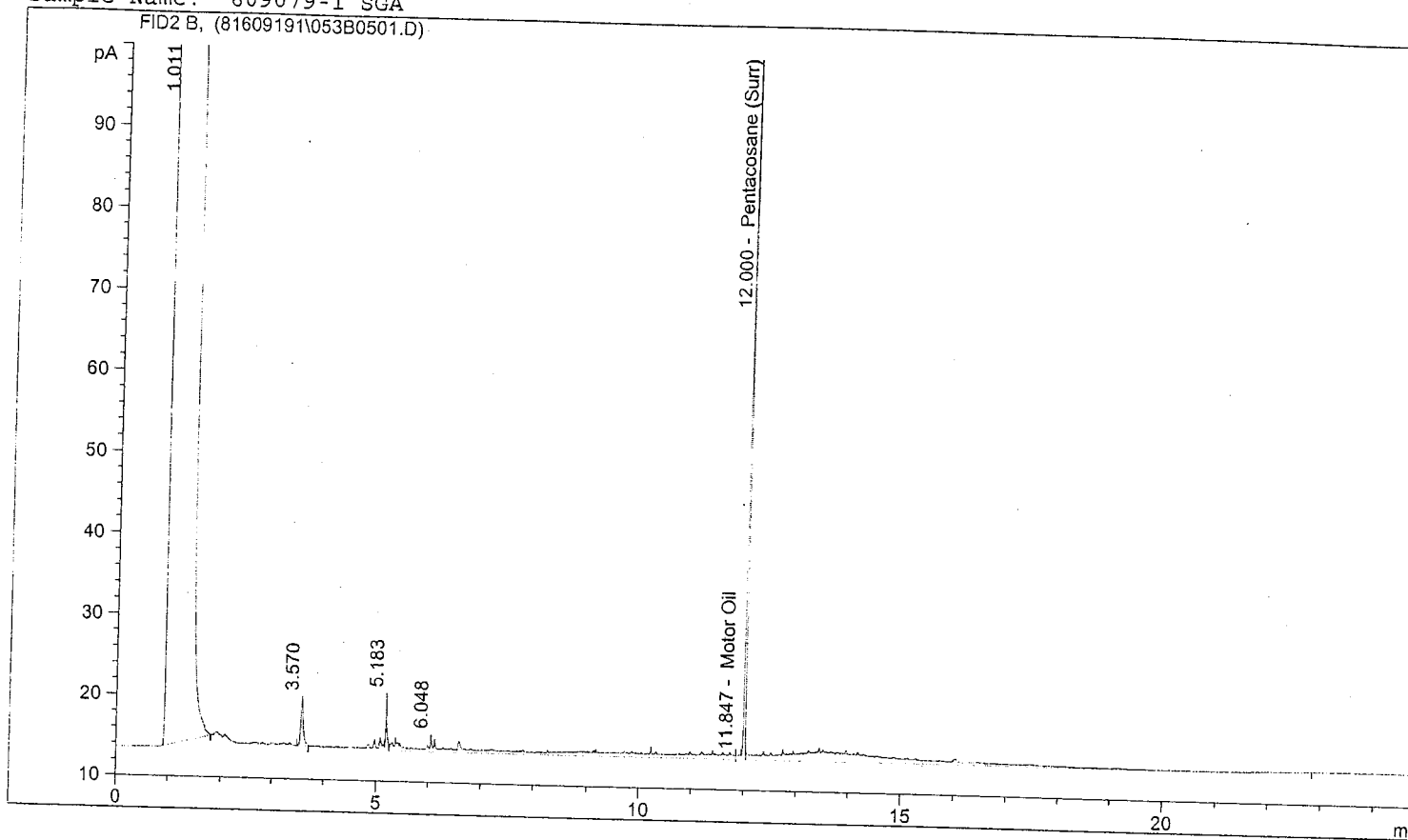
APPROVED BY:



Instrument #81
 Operator: DLC
 Method: C:\HPCHEM\1\METHODS\BDMO0806.M
 Injection Date & Time: 9/19/06 10:19:44 AM
 Report Creation: 9/19/06

Data File: C:\HPCHEM\1\DATA\81609191\053B0501.D
 9/19/06 10:19:44 AM
 11:03:50 AM

Sample Name: 609079-1 SGA



Ret. Time	Signal	Compound Name	Response	Amount ug/mL
0.000	FID2 B,	Diesel	0.000	0.000
11.847		Motor Oil	244.110	0.585
12.000		Pentacosane (Surr)	160.934	10.240 102%

D < 25 mg/kg

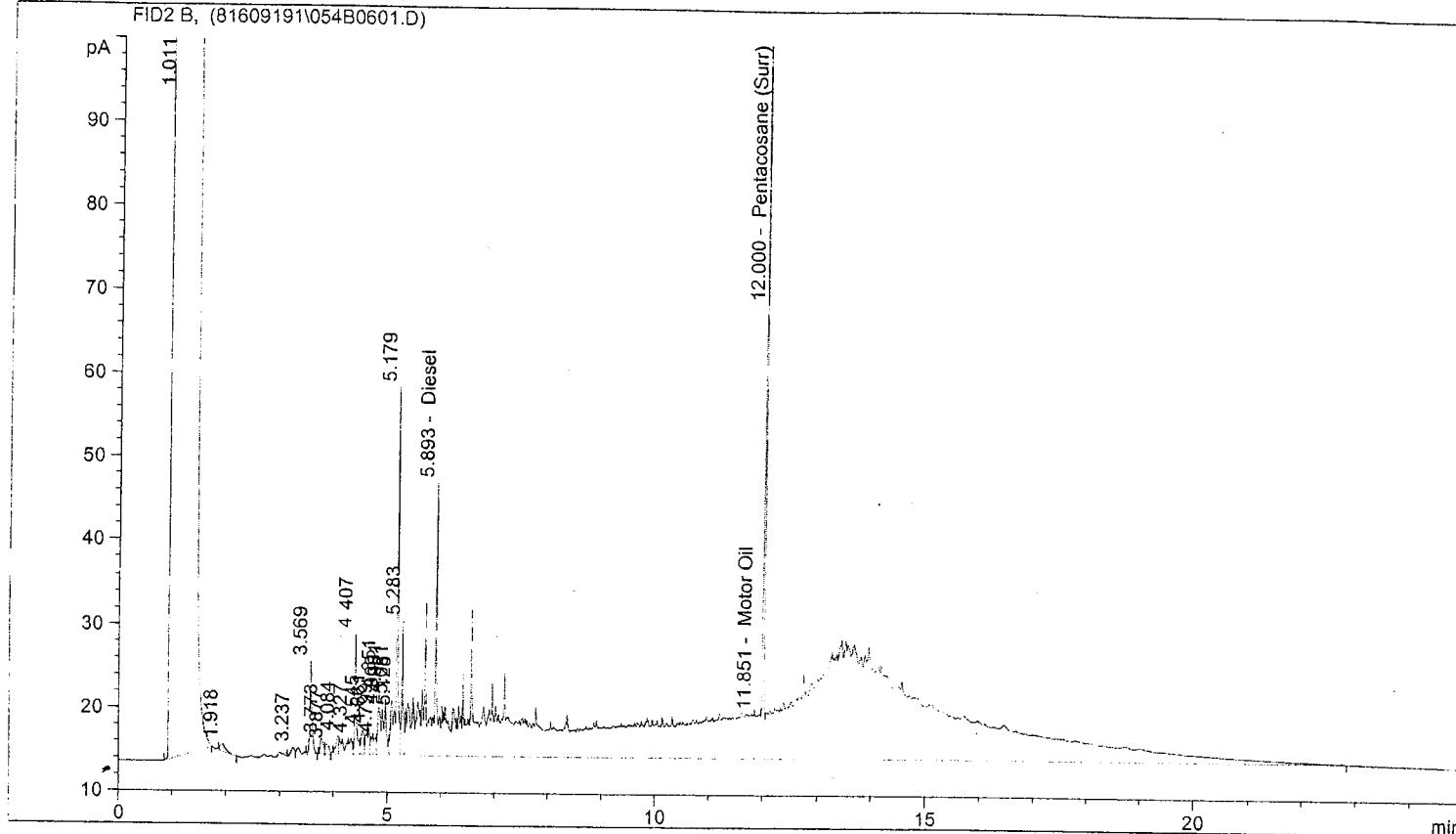
MO < 50 mg/kg

9-19-06 DC

REVIEWED BY CW
 & DATE 9/19/06

Instrument #81 Data File: C:\HPCHEM\1\DATA\81609191\054B0601.D
 Operator: DLC
 Method: C:\HPCHEM\1\METHODS\BDMO0806.M
 Injection Date & Time: 9/19/06 10:50:12 AM 9/19/06 10:50:12 AM
 Report Creation: 9/19/06 12:43:40 PM

Sample Name: 609079-2 SGA
 FID2 B, (81609191\054B0601.D)



Ret. Time	Signal	Compound Name	Response	Amount ug/mL
5.893	FID2 B,	Diesel	1726.509	135.332
11.851		Motor Oil	2694.032	242.712
12.000		Pentacosane (Surr)	168.502	10.737

24.71g

D= 55 mg/kg Early Diesel range product

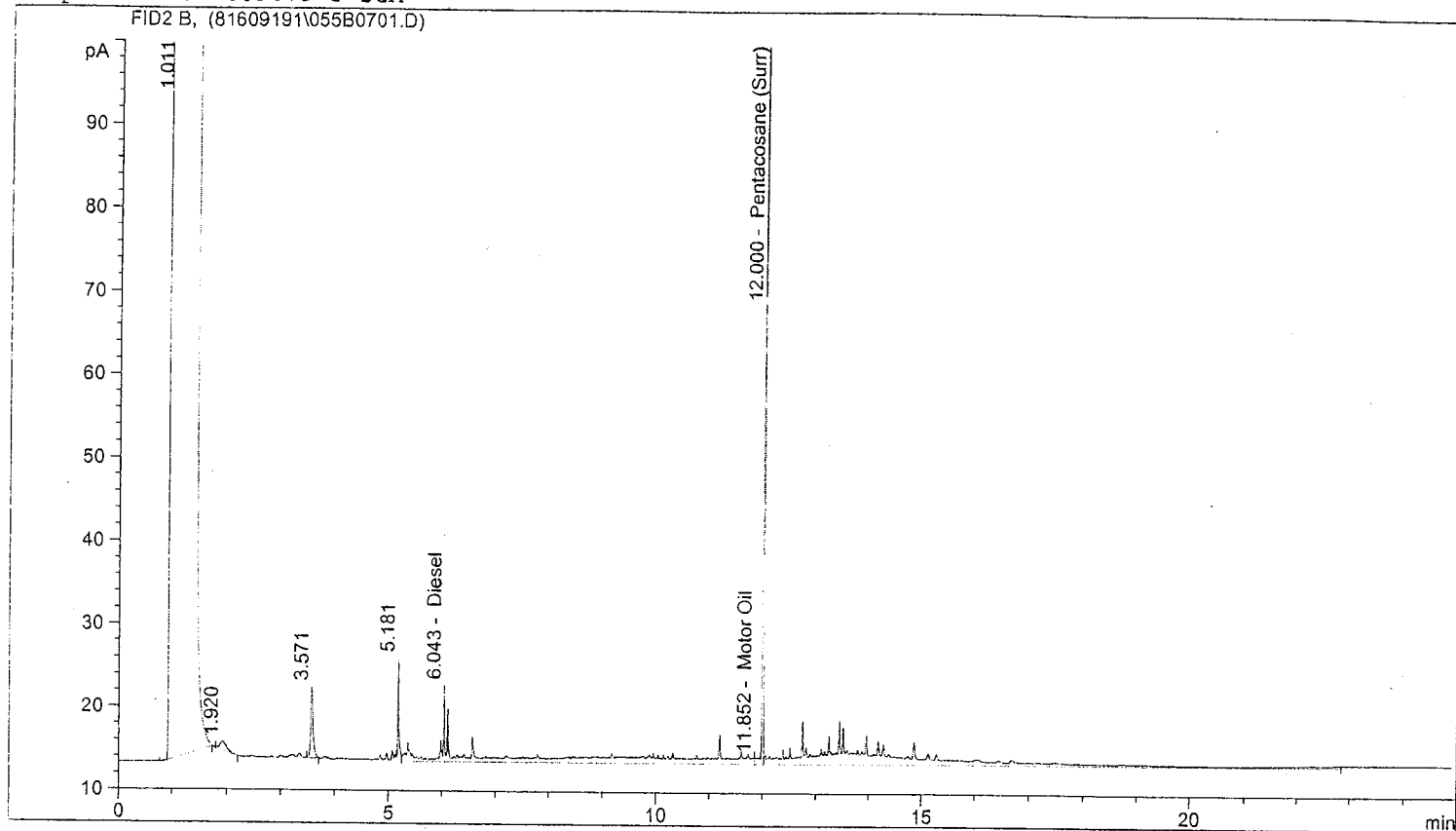
MO= 98 mg/kg Lube Oil

REVIEWED BY *aw*
 & DATE *9/19/06*

9-19-06 DC

Instrument #81 Data File: C:\HPCHEM\1\DATA\81609191\055B0701.D
 Operator: DLC
 Method: C:\HPCHEM\1\METHODS\BDMO0806.M
 Injection Date & Time: 9/19/06 11:20:38 AM 9/19/06 11:20:38 AM
 Report Creation: 9/19/06 11:50:41 AM

Sample Name: 609079-3 SGA



Ret. Time	Signal	Compound Name	Response	Amount ug/mL
6.043	FID2 B,	Diesel	273.832	18.230
11.852		Motor Oil	381.813	14.194
12.000		Pentacosane (Surr)	155.513	9.885

99%

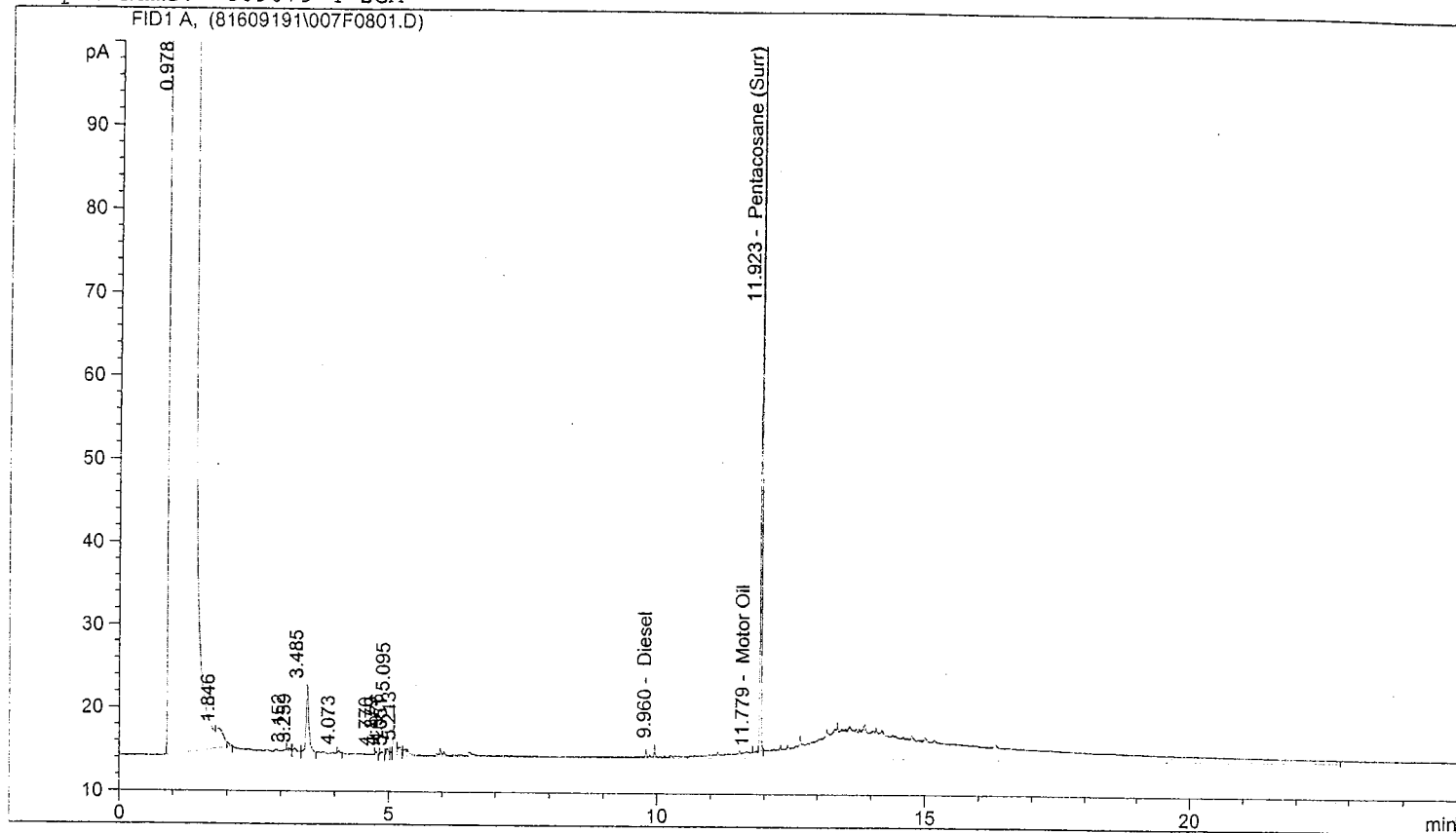
D < 25 mg/kg

MO < 50 mg/kg

9-19-06 DC

Instrument #81 Data File: C:\HPCHEM\1\DATA\81609191\007F0801.D
 Operator: DLC
 Method: C:\HPCHEM\1\METHODS\FDMO0106.M
 Injection Date & Time: 9/19/06 11:51:06 AM 9/19/06 11:51:06 AM
 Report Creation: 9/19/06 12:17:02 PM

Sample Name: 609079-4 SGA



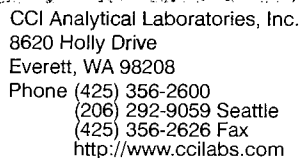
Ret. Time	Signal	Compound Name	Response	Amount ug/mL
9.960	FID1 A,	Diesel	84.625	7.294
11.779		Motor Oil	929.374	61.011
11.923		Pentacosane (Surr)	168.338	10.407

104%

D < 25 mg/kg

MO < 50 mg/kg

9-19-06 DC



CCI Job# (Laboratory Use Only)

609079

Date 9/18/06 Page 1 Of 1

PROJECT ID: Former Fire Pit SCA					ANALYSIS REQUESTED															OTHER (Specify)	
REPORT TO COMPANY: CDM					NWTPH-HCID NWTPH-DX NWTPH-GX BTEX by EPA-8021 MTBE by EPA-8021 ☐ EPA-8260 ☐ Halogenated Volatiles by EPA 8260 Volatile Organic Compounds by EPA 8260 EDB / EDC by EPA 8260 SIM (water) EDB / EDC by EPA 8260 (soil) Semivolatile Organic Compounds by EPA 8270 Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM ☐ PCB ☐ Pesticides ☐ by EPA 8081/8082 Metals-MTCA-5 ☐ RCRA-8 ☐ Pri Pol ☐ TAL ☐ Metals Other (Specify) TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐ TPH-d (diesel range) TPH-o (oil range)																
PROJECT MANAGER: Pam Morrill																					
ADDRESS: Bellevue, WA																					
PHONE: FAX: PO. NUMBER: E-MAIL:																					
INVOICE TO COMPANY:					NWTPH-HCID NWTPH-DX NWTPH-GX BTEX by EPA-8021 MTBE by EPA-8021 ☐ EPA-8260 ☐ Halogenated Volatiles by EPA 8260 Volatile Organic Compounds by EPA 8260 EDB / EDC by EPA 8260 SIM (water) EDB / EDC by EPA 8260 (soil) Semivolatile Organic Compounds by EPA 8270 Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM ☐ PCB ☐ Pesticides ☐ by EPA 8081/8082 Metals-MTCA-5 ☐ RCRA-8 ☐ Pri Pol ☐ TAL ☐ Metals Other (Specify) TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐ TPH-d (diesel range) TPH-o (oil range)																
ATTENTION:																					
ADDRESS:																					
SAMPLE I.D.	DATE	TIME	TYPE	LAB#																	
1. TP-A	9/18/06	1442	SOIL	1																	
2. TP-B	↓	1448	↓	2																	
3. TP-C	↓	1453	↓	3																	
4. TP-D	↓	1534	↓	4																	
5.																					
6.																					
7.																					
8.																					
9.																					
10.																					

SPECIAL INSTRUCTIONS

CGI Analytical Laboratories, Inc accepts and processes this request on the terms and conditions set forth on the reverse side. By its signature hereon, Customer accepts these terms and conditions.

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: Nicholas J. Lemons, CDM, 9/18/96, 1725

Received By: [Signature] C. J. H. 9/18/06 17:25

2. Relinquished By: _____

Received By: _____

TURNAROUND REQUESTED in Business Days*

OTHER:

Organic, Metals & Inorganic Analysis

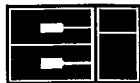
10 5 3 2 1 SAM
DA

Fuels & Hydrocarbon Analysis

☒ 5
 ☒ 3
 ☐ 1
 ☐ SAM
 ☐ DA

Specify: Drc. 9/20/36 per Law

* Turnaround request less than standard may incur Rush Charges



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LABORATORIES, INC

CERTIFICATE OF ANALYSIS

CLIENT: CAMP DRESSER & MCKEE, INC.
P.O. BOX 3885
BELLEVUE, WA 98009-3885

DATE: 9/28/2006
CCIL JOB #: 0609083
DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA
CLIENT SAMPLE ID: 9/19/2006 9:00 WC-1
CCIL SAMPLE #: -01

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX W/CLEANUP	250	MG/KG	9/20/2006	DLC
TPH-Oil Range	NWTPH-DX W/CLEANUP	350	MG/KG	9/20/2006	DLC

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCTS WHICH ARE LIKELY DIESEL FUEL AND BUNKER C
DIESEL RANGE RESULT IS BIASED HIGH DUE TO BUNKER C OVERLAP

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

APPROVED BY:



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LABORATORIES, INC

CERTIFICATE OF ANALYSIS

CLIENT: CAMP DRESSER & MCKEE, INC.
P.O. BOX 3885
BELLEVUE, WA 98009-3885

DATE: 9/28/2006
CCIL JOB #: 0609083
DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA
CLIENT SAMPLE ID: 9/19/2006 9:00 WC-1
CCIL SAMPLE #: -01

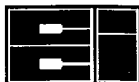
DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TCLP-Arsenic	EPA-1311/6010	ND(<0.04)	MG/L	9/22/2006	ICP
TCLP-Barium	EPA-1311/6010	0.74	MG/L	9/22/2006	ICP
TCLP-Cadmium	EPA-1311/6010	0.019	MG/L	9/22/2006	ICP
TCLP-Chromium	EPA-1311/6010	0.030	MG/L	9/22/2006	ICP
TCLP-Lead	EPA-1311/6010	0.18	MG/L	9/22/2006	ICP
TCLP-Mercury	EPA-1311/7470	ND(<0.0002)	MG/L	9/27/2006	CEO
TCLP-Selenium	EPA-1311/6010	0.11	MG/L	9/22/2006	ICP
TCLP-Silver	EPA-1311/6010	ND(<0.03)	MG/L	9/22/2006	ICP

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.

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APPROVED BY:



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LABORATORIES, INC

CERTIFICATE OF ANALYSIS

CLIENT: CAMP DRESSER & MCKEE, INC.
P.O. BOX 3885
BELLEVUE, WA 98009-3885

DATE: 9/28/2006
CCIL JOB #: 0609083
DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA
CLIENT SAMPLE ID: 9/19/2006 9:57 CS-1
CCIL SAMPLE #: -02

DATA RESULTS

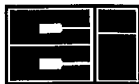
ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX W/CLEANUP	600	MG/KG	9/20/2006	DLC
TPH-Oil Range	NWTPH-DX W/CLEANUP	800	MG/KG	9/20/2006	DLC
Lead	EPA-6010	160	MG/KG	9/20/2006	ICP

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCTS WHICH ARE LIKELY HIGHLY WEATHERED DIESEL FUEL AND LUBE OIL

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APPROVED BY:



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LABORATORIES, INC

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CLIENT: CAMP DRESSER & MCKEE, INC.
P.O. BOX 3885
BELLEVUE, WA 98009-3885

DATE: 9/28/2006
CCIL JOB #: 0609083
DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA
CLIENT SAMPLE ID: 9/19/2006 14:25 CS-2
CCIL SAMPLE #: -03

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX W/CLEANUP	190	MG/KG	9/20/2006	DLC
TPH-Oil Range	NWTPH-DX W/CLEANUP	240	MG/KG	9/20/2006	DLC
Lead	EPA-6010	110	MG/KG	9/20/2006	ICP

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCTS WHICH ARE LIKELY HIGHLY WEATHERED DIESEL FUEL AND LUBE OIL

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APPROVED BY:

CERTIFICATE OF ANALYSIS

CLIENT: CAMP DRESSER & MCKEE, INC.
P.O. BOX 3885
BELLEVUE, WA 98009-3885

DATE: 9/28/2006
CCIL JOB #: 0609083
DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA
CLIENT SAMPLE ID: 9/19/2006 10:06 CS-3
CCIL SAMPLE #: -04

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX W/CLEANUP	350	MG/KG	9/20/2006	DLC
TPH-Oil Range	NWTPH-DX W/CLEANUP	660	MG/KG	9/20/2006	DLC
Lead	EPA-6010	160	MG/KG	9/20/2006	ICP

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCTS WHICH ARE LIKELY DIESEL FUEL AND BUNKER C OR SIMILAR PRODUCT

DIESEL RANGE RESULT IS BIASED HIGH DUE TO OIL RANGE OVERLAP

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.

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APPROVED BY:





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ANALYTICAL
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CLIENT: CAMP DRESSER & MCKEE, INC.
P.O. BOX 3885
BELLEVUE, WA 98009-3885

DATE: 9/28/2006
CCIL JOB #: 0609083
DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA
CLIENT SAMPLE ID: 9/19/2006 10:11 CS-4
CCIL SAMPLE #: -05

DATA RESULTS

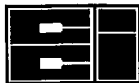
ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX W/CLEANUP	370	MG/KG	9/20/2006	DLC
TPH-Oil Range	NWTPH-DX W/CLEANUP	700	MG/KG	9/20/2006	DLC
Lead	EPA-6010	220	MG/KG	9/20/2006	ICP

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCTS WHICH ARE LIKELY HIGHLY WEATHERED DIESEL FUEL AND LUBE OIL

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** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

APPROVED BY:



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ANALYTICAL
LABORATORIES, INC

CERTIFICATE OF ANALYSIS

CLIENT: CAMP DRESSER & MCKEE, INC.
P.O. BOX 3885
BELLEVUE, WA 98009-3885

DATE: 9/28/2006
CCIL JOB #: 0609083
DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA
CLIENT SAMPLE ID: 9/19/2006 14:07 CS-5
CCIL SAMPLE #: -06

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX W/CLEANUP	ND(<25)	MG/KG	9/20/2006	DLC
TPH-Oil Range	NWTPH-DX W/CLEANUP	65	MG/KG	9/20/2006	DLC
Lead	EPA-6010	80	MG/KG	9/20/2006	ICP

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY LUBE OIL

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

APPROVED BY:



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ANALYTICAL
LABORATORIES, INC

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CLIENT: CAMP DRESSER & MCKEE, INC.
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BELLEVUE, WA 98009-3885

DATE: 9/28/2006
CCIL JOB #: 0609083
DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA
CLIENT SAMPLE ID: 9/19/2006 10:20 CS-6
CCIL SAMPLE #: -07

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX W/CLEANUP	44	MG/KG	9/20/2006	DLC
TPH-Oil Range	NWTPH-DX W/CLEANUP	64	MG/KG	9/20/2006	DLC
Lead	EPA-6010	14	MG/KG	9/20/2006	ICP

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS BUNKER C OR SIMILAR PRODUCT

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

APPROVED BY:



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P.O. BOX 3885
BELLEVUE, WA 98009-3885

DATE: 9/28/2006
CCIL JOB #: 0609083
DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA
CLIENT SAMPLE ID: 9/19/2006 10:23 CS-7
CCIL SAMPLE #: -08

DATA RESULTS

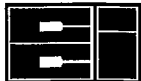
ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX W/CLEANUP	55	MG/KG	9/20/2006	DLC
TPH-Oil Range	NWTPH-DX W/CLEANUP	170	MG/KG	9/20/2006	DLC
Lead	EPA-6010	27	MG/KG	9/20/2006	ICP

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS EXTREMELY WEATHERED BUNKER C OR SIMILAR PRODUCT

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.

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APPROVED BY:



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ANALYTICAL
LABORATORIES, INC

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P.O. BOX 3885
BELLEVUE, WA 98009-3885

DATE: 9/28/2006
CCIL JOB #: 0609083
DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA
CLIENT SAMPLE ID: 9/19/2006 10:27 CS-8
CCIL SAMPLE #: -09

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX W/CLEANUP	ND(<25)	MG/KG	9/20/2006	DLC
TPH-Oil Range	NWTPH-DX W/CLEANUP	66	MG/KG	9/20/2006	DLC
Lead	EPA-6010	67	MG/KG	9/20/2006	ICP

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY LUBE OIL

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.

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APPROVED BY:



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BELLEVUE, WA 98009-3885

DATE: 9/28/2006
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DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA
CLIENT SAMPLE ID: 9/19/2006 10:30 CS-9
CCIL SAMPLE #: -10

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX W/CLEANUP	73	MG/KG	9/20/2006	DLC
TPH-Oil Range	NWTPH-DX W/CLEANUP	72	MG/KG	9/20/2006	DLC
Lead	EPA-6010	5.0	MG/KG	9/20/2006	ICP

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS BUNKER C OR SIMILAR PRODUCT

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APPROVED BY:



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DATE: 9/28/2006
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DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA
CLIENT SAMPLE ID: 9/19/2006 13:37 CS-10
CCIL SAMPLE #: -11

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX W/CLEANUP	ND(<25)	MG/KG	9/20/2006	DLC
TPH-Oil Range	NWTPH-DX W/CLEANUP	99	MG/KG	9/20/2006	DLC
Lead	EPA-6010	11	MG/KG	9/20/2006	ICP

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY LUBE OIL

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

APPROVED BY:



CCI
ANALYTICAL
LABORATORIES, INC

CERTIFICATE OF ANALYSIS

CLIENT: CAMP DRESSER & MCKEE, INC.
P.O. BOX 3885
BELLEVUE, WA 98009-3885

DATE: 9/28/2006
CCIL JOB #: 0609083
DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA
CLIENT SAMPLE ID: 9/19/2006 14:35 CS-11
CCIL SAMPLE #: -12

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX W/CLEANUP	ND(<25)	MG/KG	9/20/2006	DLC
TPH-Oil Range	NWTPH-DX W/CLEANUP	ND(<50)	MG/KG	9/20/2006	DLC
Lead	EPA-6010	89	MG/KG	9/20/2006	ICP

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

APPROVED BY:



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ANALYTICAL
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DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA

QUALITY CONTROL RESULTS

SURROGATE RECOVERY

CCIL SAMPLE ID	METHOD	SUR ID	% RECV
0609083-01	NWTPH-DX W/CLEANUP	C25	109
0609083-02	NWTPH-DX W/CLEANUP	C25	120
0609083-03	NWTPH-DX W/CLEANUP	C25	115
0609083-04	NWTPH-DX W/CLEANUP	C25	125
0609083-05	NWTPH-DX W/CLEANUP	C25	120
0609083-06	NWTPH-DX W/CLEANUP	C25	116
0609083-07	NWTPH-DX W/CLEANUP	C25	113
0609083-08	NWTPH-DX W/CLEANUP	C25	104
0609083-09	NWTPH-DX W/CLEANUP	C25	110
0609083-10	NWTPH-DX W/CLEANUP	C25	102
0609083-11	NWTPH-DX W/CLEANUP	C25	103
0609083-12	NWTPH-DX W/CLEANUP	C25	103



CERTIFICATE OF ANALYSIS

CLIENT: CAMP DRESSER & MCKEE, INC.
P.O. BOX 3885
BELLEVUE, WA 98009-3885

DATE: 9/28/2006
CCIL JOB #: 0609083
DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA

QUALITY CONTROL RESULTS

BLANK RESULTS

METHOD	MATRIX	QC BATCH ID	ASSOCIATED SAMPLES	ANALYTE	RESULT	UNITS
NWTPH-DX	Soil	DS092006	0609083 -01 to 12	TPH-Diesel Range	ND(<25)	MG/KG
NWTPH-DX	Soil	DS092006	0609083 -01 to 12	TPH-Oil Range	ND(<50)	MG/KG
EPA-6010	Soil	ICPMET-S-092006-1	0609083 -02 to 12	Lead	ND(<0.72)	MG/KG
EPA-1311/6010	TCLP	HG-W-092706-1	0609083 -01	TCLP-Selenium	ND(<0.04)	MG/L
EPA-1311/6010	TCLP	METALS-W-092206-1	0609083 -01	TCLP-Arsenic	ND(<0.04)	MG/L
EPA-1311/6010	TCLP	METALS-W-092206-1	0609083 -01	TCLP-Barium	ND(<0.02)	MG/L
EPA-1311/6010	TCLP	METALS-W-092206-1	0609083 -01	TCLP-Cadmium	ND(<0.005)	MG/L
EPA-1311/6010	TCLP	METALS-W-092206-1	0609083 -01	TCLP-Chromium	ND(<0.007)	MG/L
EPA-1311/6010	TCLP	METALS-W-092206-1	0609083 -01	TCLP-Lead	ND(<0.04)	MG/L
EPA-1311/7470	TCLP	METALS-W-092206-1	0609083 -01	TCLP-Mercury	ND(<0.0002)	MG/L
EPA-1311/6010	TCLP	METALS-W-092206-1	0609083 -01	TCLP-Silver	ND(<0.03)	MG/L



CCI
ANALYTICAL
LABORATORIES, INC

CERTIFICATE OF ANALYSIS

CLIENT: CAMP DRESSER & MCKEE, INC.
P.O. BOX 3885
BELLEVUE, WA 98009-3885

DATE: 9/28/2006
CCIL JOB #: 0609083
DATE RECEIVED: 9/19/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: PAM MORRILL
CLIENT PROJECT ID: FORMER FIRE PIT SCA

QUALITY CONTROL RESULTS

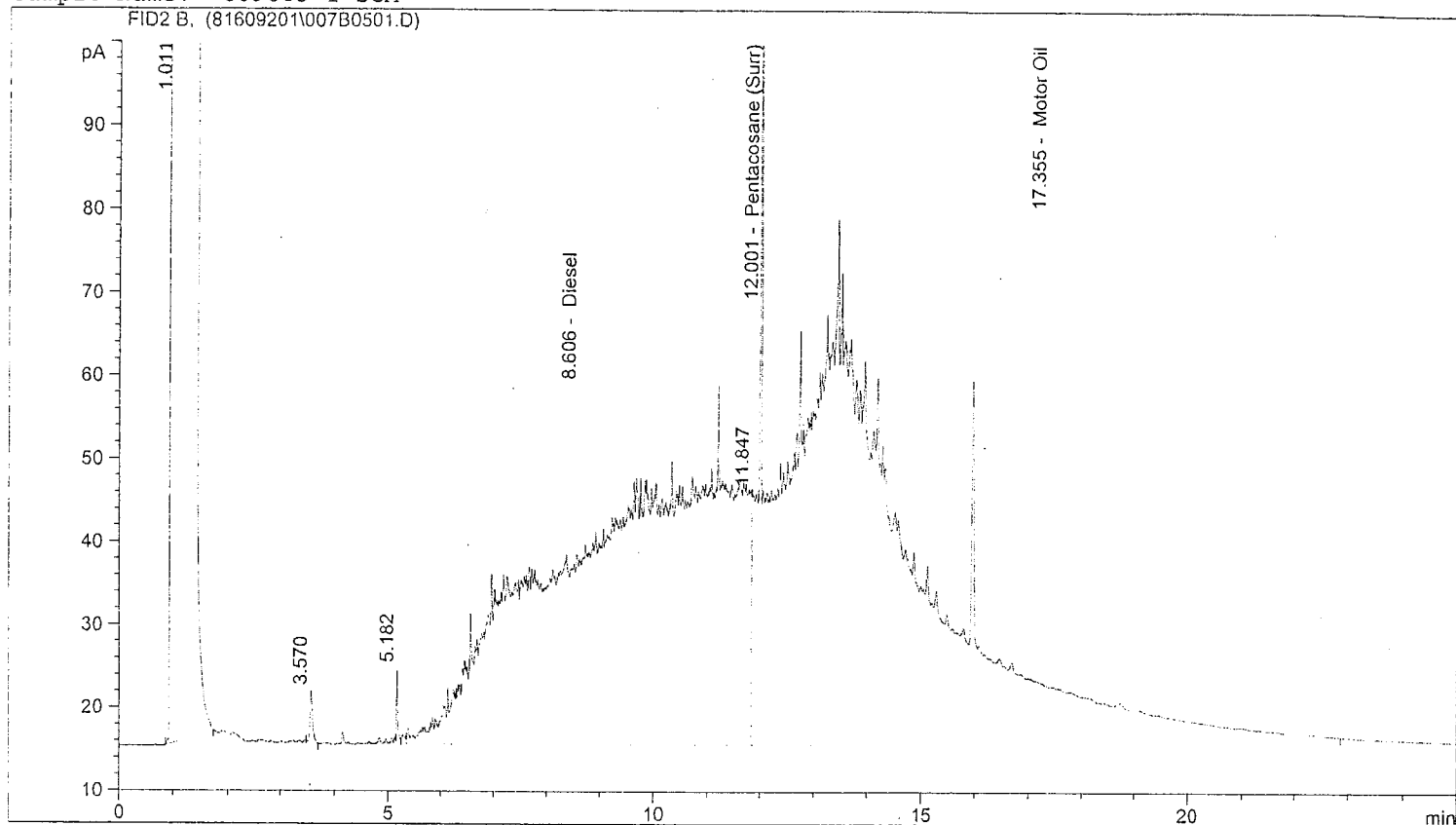
SPIKE/SPIKE DUPLICATE RESULTS

METHOD	MATRIX	QC BATCH ID	ASSOCIATED SAMPLES	ANALYTE	SPIKE RECOVERY	SPIKE DUP RECOVERY	RPD
NWTPH-DX	Soil	DS092006	0609083 -01 to 12	TPH-Diesel Range	97 %	96 %	1
EPA-6010	Soil	ICPMET-S-092006-1	0609083 -02 to 12	Lead	99 %	101 %	1
EPA-1311/6010	TCLP	HG-W-092706-1	0609083 -01	TCLP-Selenium	112 %	116 %	4
EPA-1311/6010	TCLP	METALS-W-092206-1	0609083 -01	TCLP-Arsenic	101 %	105 %	4
EPA-1311/6010	TCLP	METALS-W-092206-1	0609083 -01	TCLP-Barium	89 %	93 %	4
EPA-1311/6010	TCLP	METALS-W-092206-1	0609083 -01	TCLP-Cadmium	97 %	100 %	3
EPA-1311/6010	TCLP	METALS-W-092206-1	0609083 -01	TCLP-Chromium	96 %	99 %	3
EPA-1311/6010	TCLP	METALS-W-092206-1	0609083 -01	TCLP-Lead	105 %	108 %	3
EPA-1311/7470	TCLP	METALS-W-092206-1	0609083 -01	TCLP-Mercury	95 %	98 %	3
EPA-1311/6010	TCLP	METALS-W-092206-1	0609083 -01	TCLP-Silver	94 %	98 %	4

APPROVED BY:

Instrument #81 Data File: C:\HPCHEM\1\DATA\81609201\007B0501.D
 Operator: DLC
 Method: C:\HPCHEM\1\METHODS\BDMO0806.M
 Injection Date & Time: 9/20/06 10:08:02 AM 9/20/06 10:08:02 AM
 Report Creation: 9/20/06 1:13:30 PM

Sample Name: 609083-1 SGA



Ret. Time	Signal	Compound Name	Response	Amount ug/mL
8.606	FID2 B,	Diesel	8041.343	644.379
12.001		Pentacosane (Surr)	170.243	10.851
17.355		Motor Oil	9508.476	916.186

25.9/g

D = 250 mg/kg Diesel fuel (bias high due to bunker C overlap)

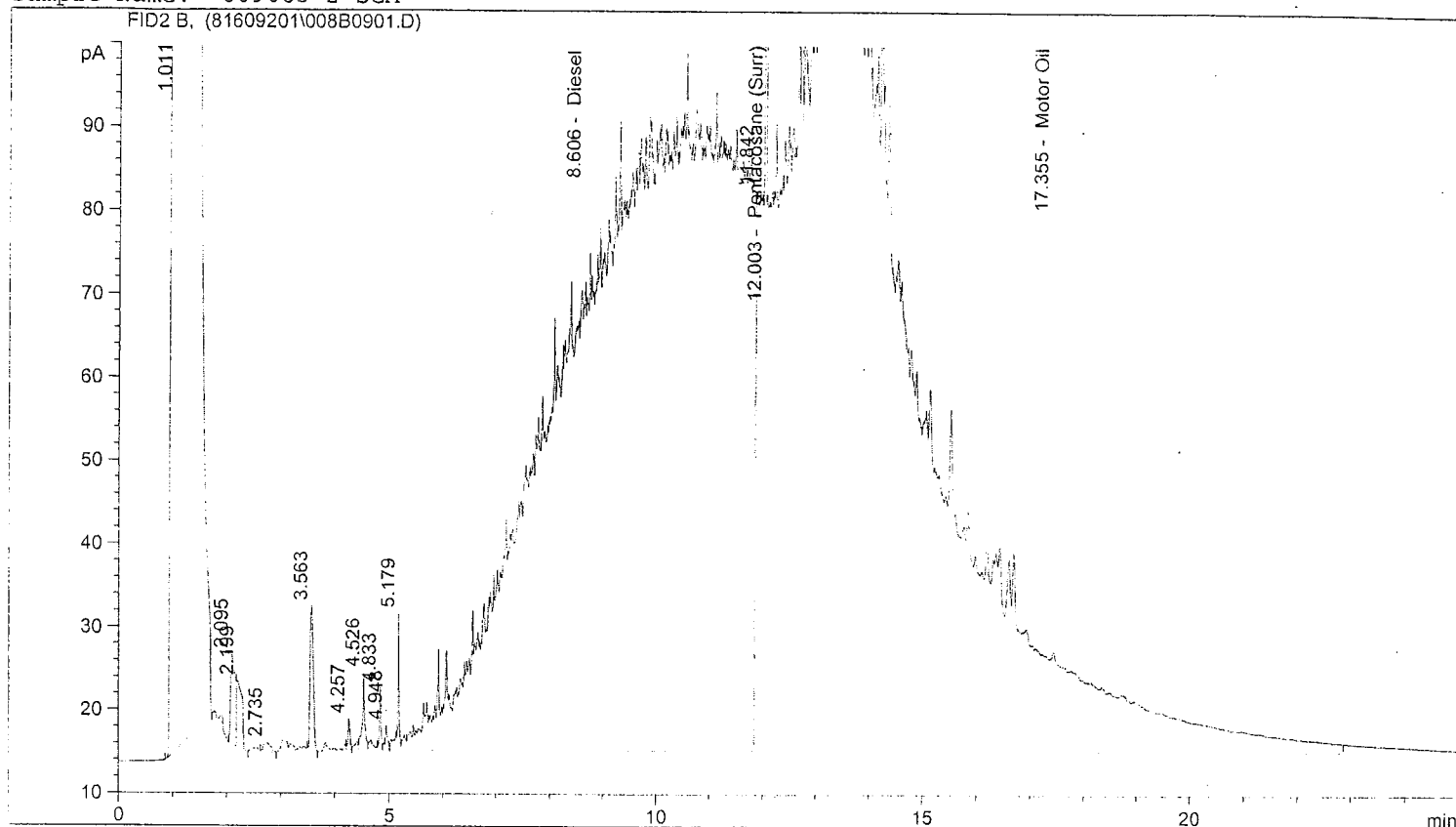
MO = 350 mg/kg Bunker C or similar

REVIEWED BY *18*
 & DATE *9/20/06*

9-20-06 DC

Instrument #81 Data File: C:\HPCHEM\1\DATA\81609201\008B0901.D
 Operator: DLC
 Method: C:\HPCHEM\1\METHODS\BDMO0806.M
 Injection Date & Time: 9/20/06 12:09:33 PM 9/20/06 12:09:33 PM
 Report Creation: 9/20/06 1:16:31 PM

Sample Name: 609083-2 SGA



Ret. Time	Signal	Compound Name	Response	Amount ug/mL
8.606	FID2 B,	Diesel	17670.375	1420.588
12.003		Pentacosane (Surr)	188.311	12.037
17.355		Motor Oil	19513.826	1905.019

23.79g

D = 600 mg/kg Highly Weathered
 Diesel Fuel

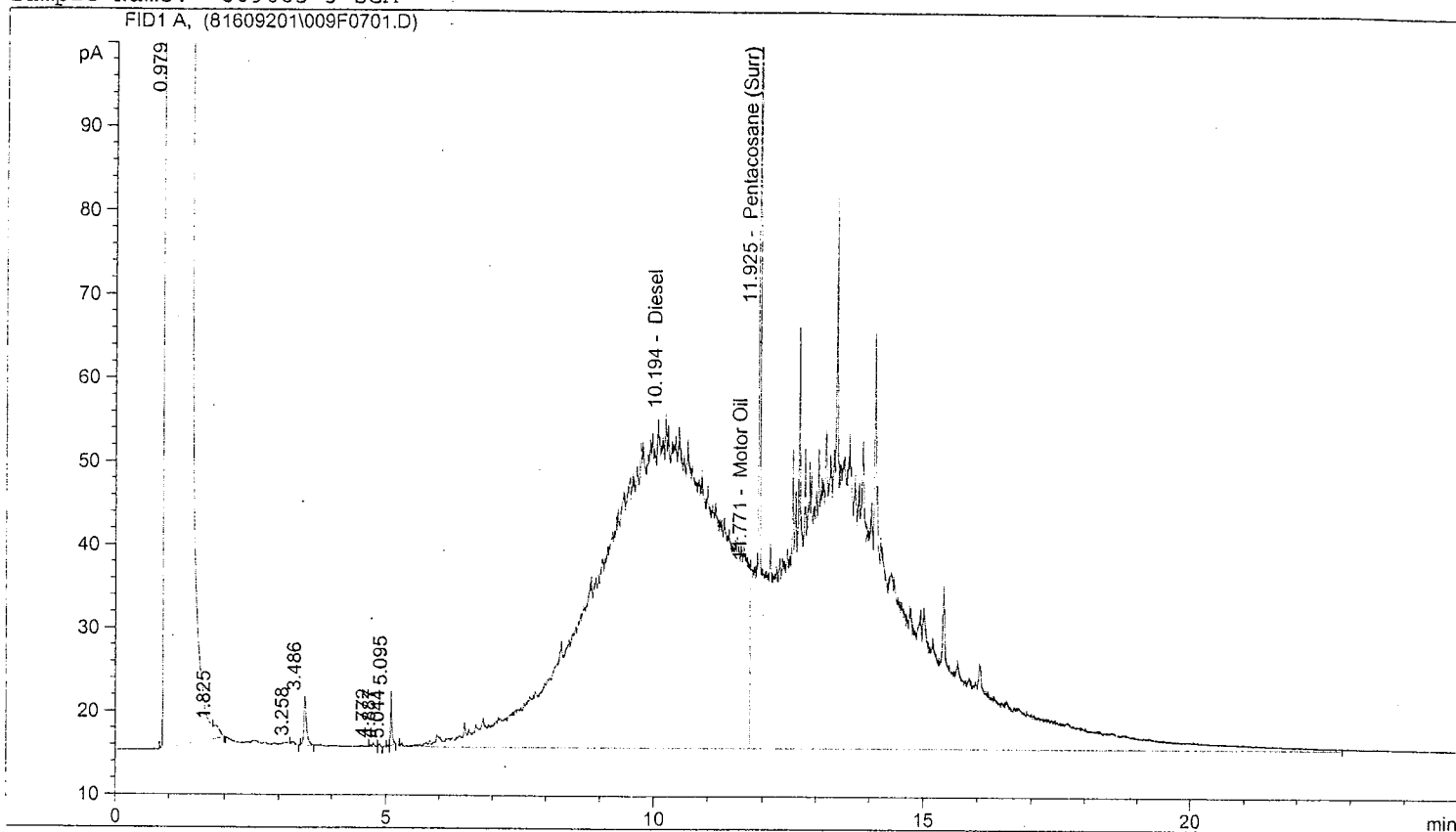
MO = 800 mg/kg Lube Oil

REVIEWED BY *MB*
 & DATE *9/20/06*

9-20-06 DC

Instrument #81 Data File: C:\HPCHEM\1\DATA\81609201\009F0701.D
 Operator: DLC
 Method: C:\HPCHEM\1\METHODS\FDMO0106.M
 Injection Date & Time: 9/20/06 11:08:44 AM 9/20/06 11:08:44 AM
 Report Creation: 9/20/06 1:02:18 PM

Sample Name: 609083-3 SGA



Ret. Time	Signal	Compound Name	Response	Amount ug/mL
10.194	FID1 A,	Diesel	6260.861	459.285
11.771		Motor Oil	6352.821	580.914
11.925		Pentacosane (Surr)	187.600	11.547 115%

24.50g

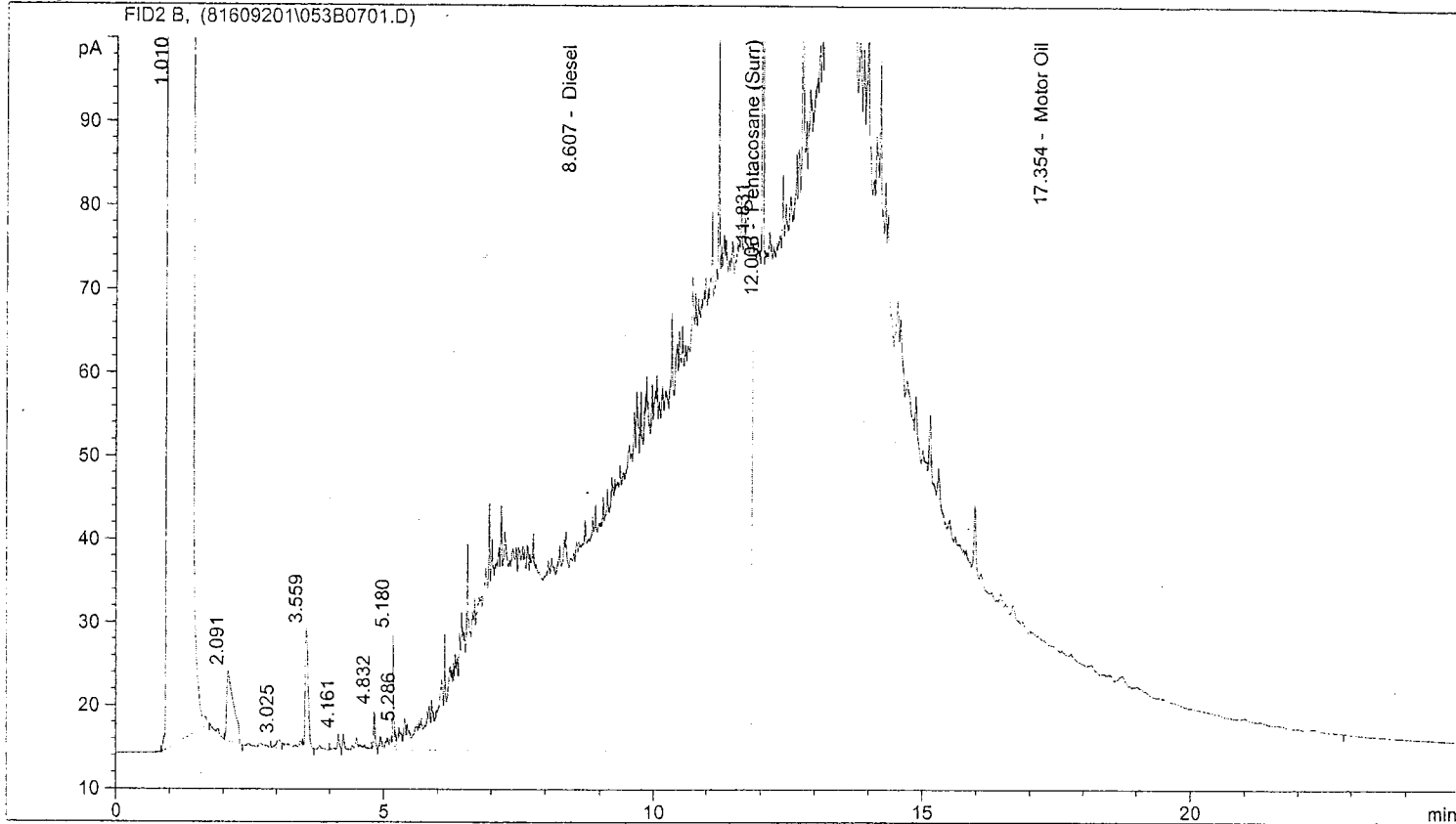
D= 190 mg/kg Highly Weathered
 Diesel Fuel

MO= 240 mg/kg Lubric Oil

RECEIVED BY *MB*
 DATE *9/20/06*

9-20-06 DC

Sample Name: 609083-4 SGA



Ret. Time	Signal	Compound Name	Response	Amount ug/mL
8.607	FID2 B,	Diesel	11719.124	940.850
12.003		Pentacosane (Surr)	195.345	12.498
17.354		Motor Oil	18142.168	1769.458

26.87g

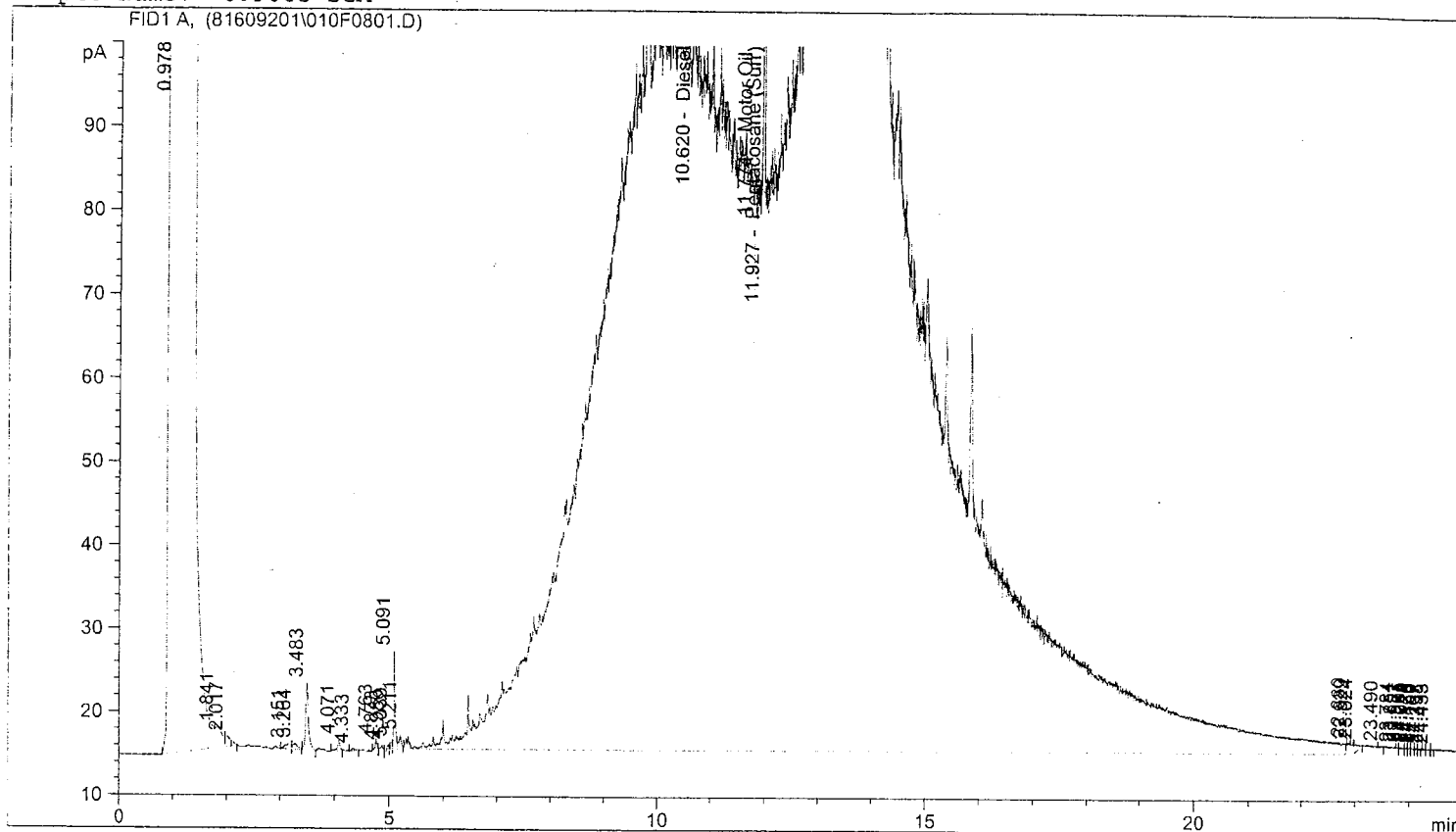
D= 350 mg/kg Diesel fuel (bias high
 due to Bunker C overlap)

MO= 660 mg/kg ~~lubricant~~ Bunker C or Similar
 9-20-06 DC

REVIEWED BY *RB*
 & DATE *9/20/06*

Instrument #81 Data File: C:\HPCHEM\1\DATA\81609201\010F0801.D
 Operator: DLC
 Method: C:\HPCHEM\1\METHODS\FDMO0106.M
 Injection Date & Time: 9/20/06 11:39:08 AM 9/20/06 11:39:08 AM
 Report Creation: 9/20/06 1:03:43 PM

83-5
 Sample Name: 609085-5 SGA



Ret. Time	Signal	Compound Name	Response	Amount ug/mL
10.620	FID1 A,	Diesel	15760.364	1154.480
11.774		Motor Oil	22841.395	2161.543
11.927		Pentacosane (Surr)	195.001	11.985 120/
				31.08g

D= 370 mg/kg Highly weathered
 Diesel fuel

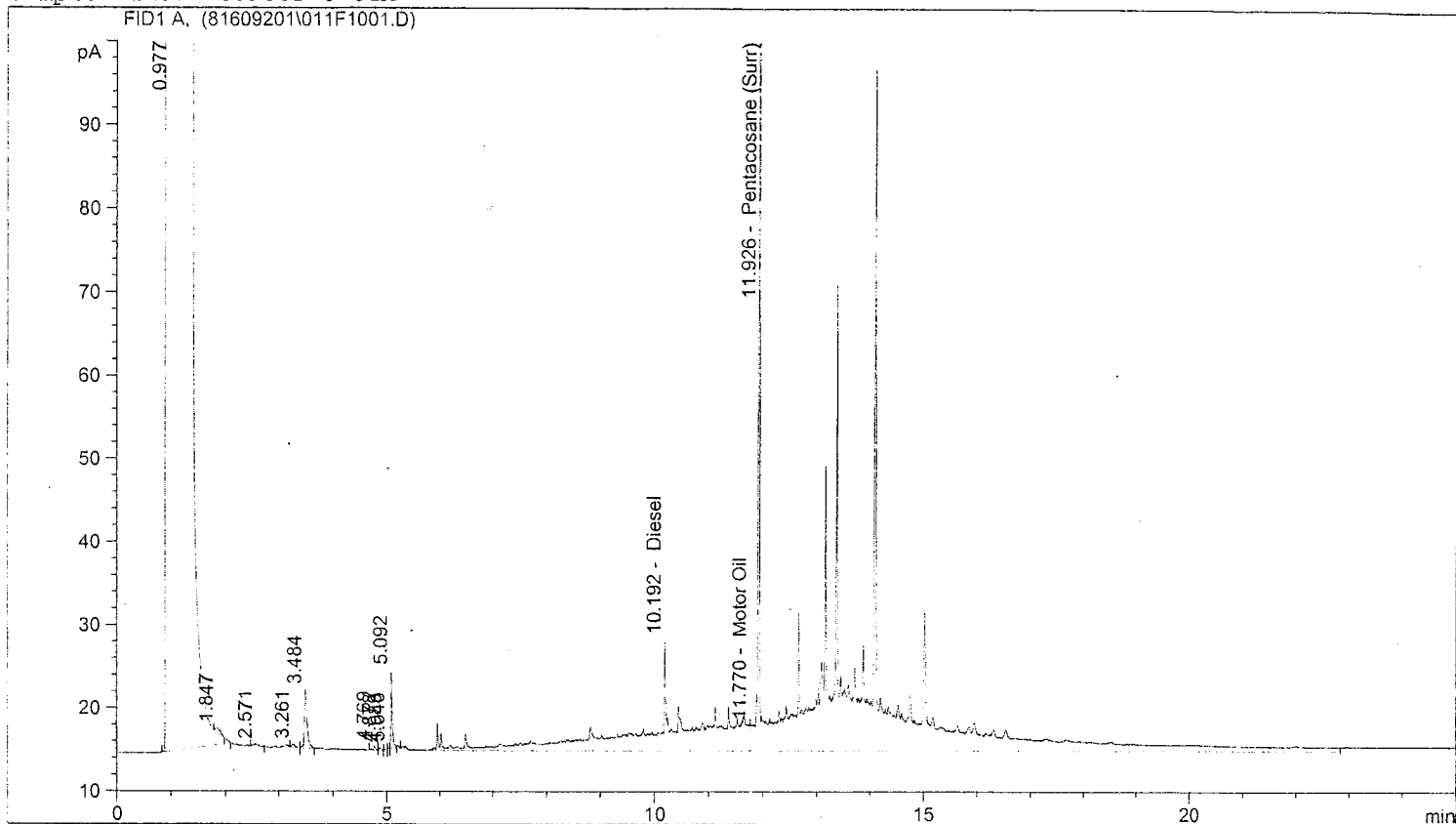
MO= 700 mg/kg Lube Oil

REVIEWED BY *16*
 & DATE *9/20/06*

9-20-06 DC

Instrument #81 Data File: C:\HPCHEM\1\DATA\81609201\011F1001.D
 Operator: DLC
 Method: C:\HPCHEM\1\METHODS\FDMO0106.M
 Injection Date & Time: 9/20/06 12:40:01 PM 9/20/06 12:40:01 PM
 Report Creation: 9/20/06 1:07:11 PM

Sample Name: 609083-6 SGA



Ret. Time	Signal	Compound Name	Response	Amount ug/mL
10.192	FID1 A,	Diesel	587.790	44.117
11.770		Motor Oil	1821.114	146.495
11.926		Pentacosane (Surr)	188.158	11.580

22.52g

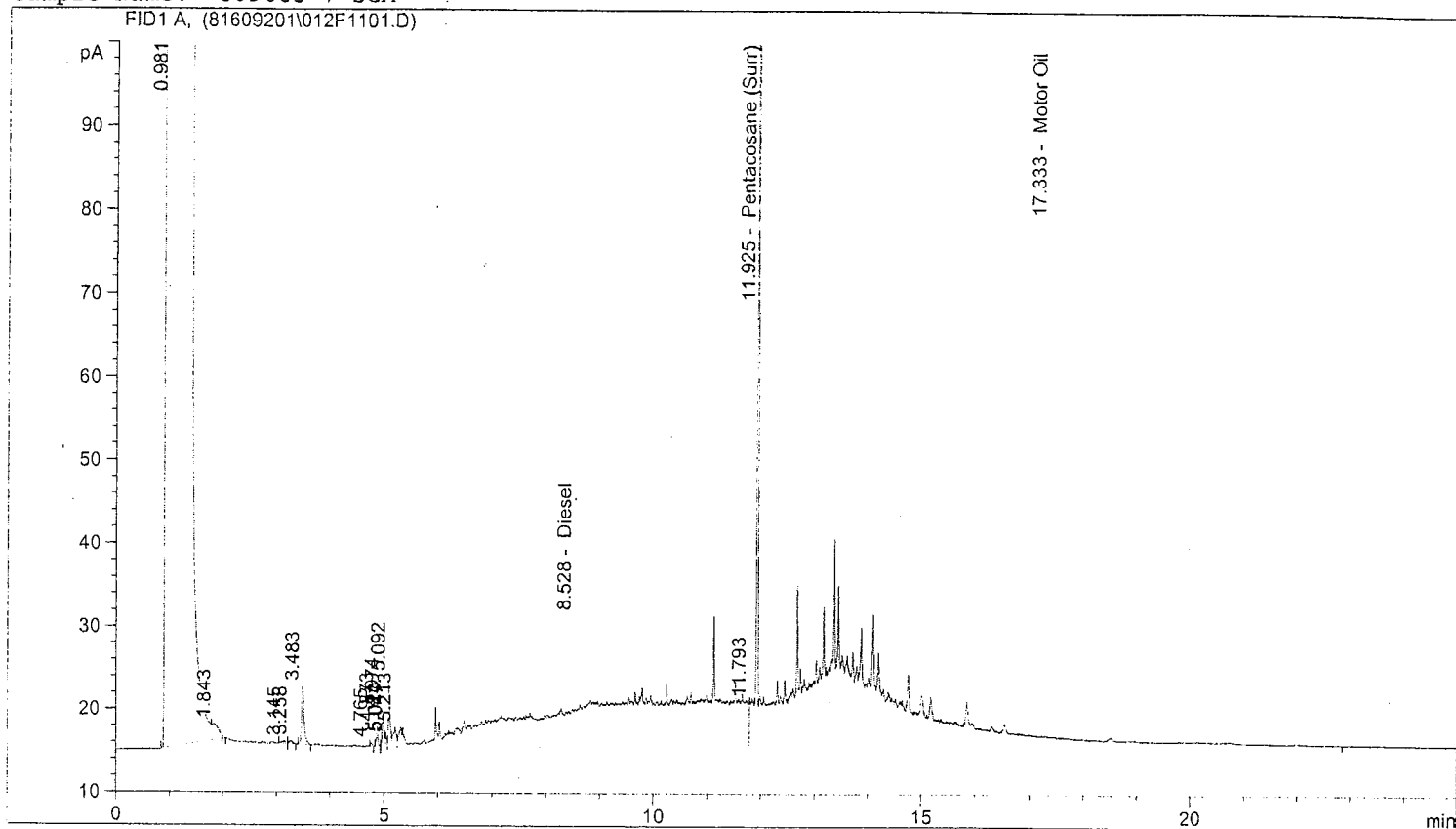
D < 25 mg/kg

MO = 65 mg/kg ~~Bunker C~~ DC
 Lube Oil

9-20-06 DC

REVIEWED BY *MS*
 DATE *9/20/06*

Sample Name: 609083-7 SGA



Ret. Time	Signal	Compound Name	Response	Amount ug/mL
8.528	FID1 A,	Diesel	1590.365	117.487
11.925		Pentacosane (Surr)	184.238	11.348 113%
17.333		Motor Oil	2101.685	173.392

26.94g

D = 44 mg/kg

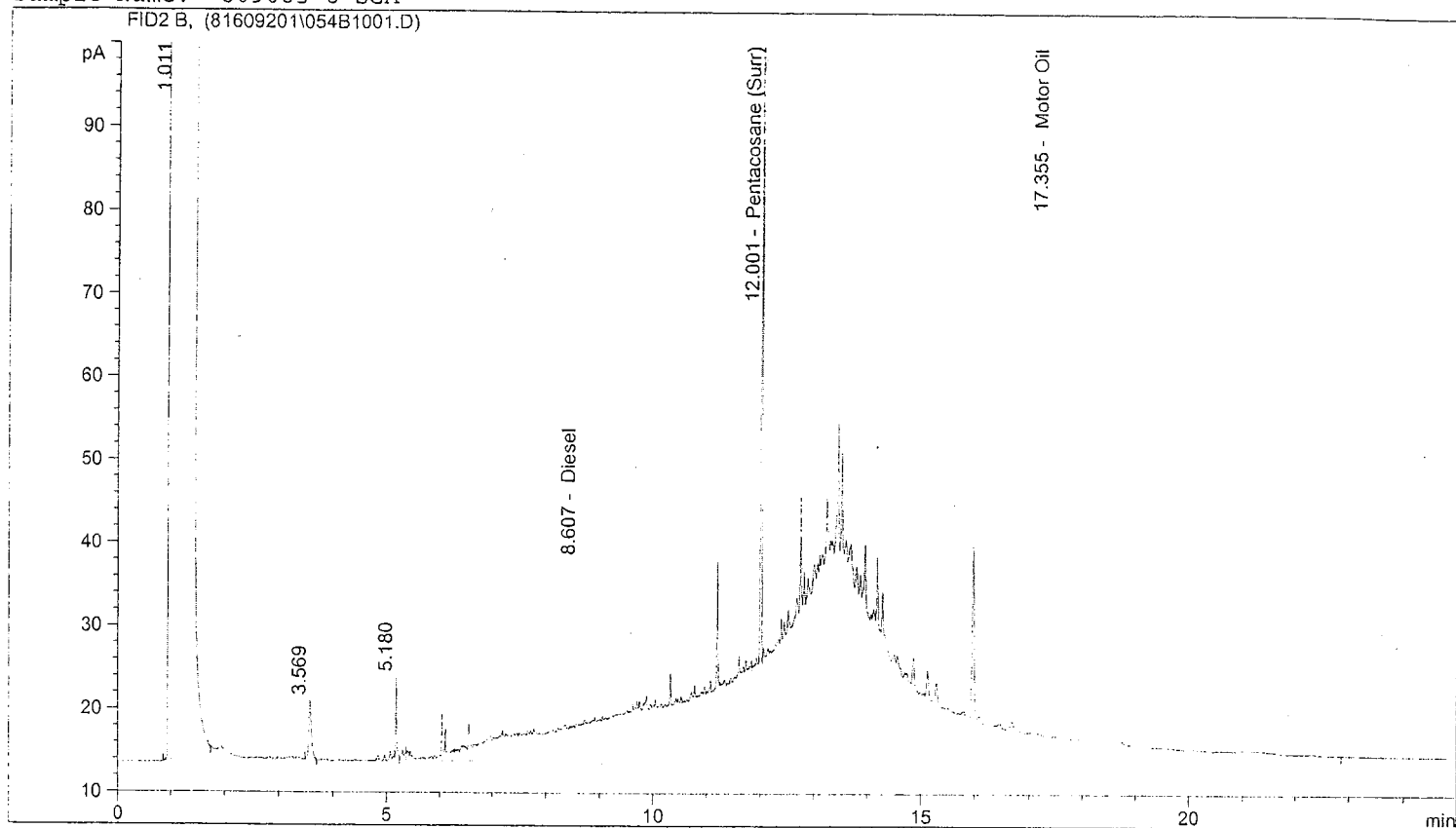
MO = 64 mg/kg Bunker C or similar

9-20-06 DC

REVIEWED BY *AB*
 & DATE *9/20/06*

Instrument #81 Data File: C:\HPCHEM\1\DATA\81609201\054B1001.D
 Operator: DLC
 Method: C:\HPCHEM\1\METHODS\BDMO0806.M
 Injection Date & Time: 9/20/06 12:40:01 PM 9/20/06 12:40:01 PM
 Report Creation: 9/20/06 1:17:31 PM

Sample Name: 609083-8 SGA



Ret. Time	Signal	Compound Name	Response	Amount ug/mL
8.607	FID2 B,	Diesel	1899.995	149.317
12.001		Pentacosane (Surr)	163.408	10.403
17.355		Motor Oil	4859.759	456.752

27.37g

D = 55 mg/kg

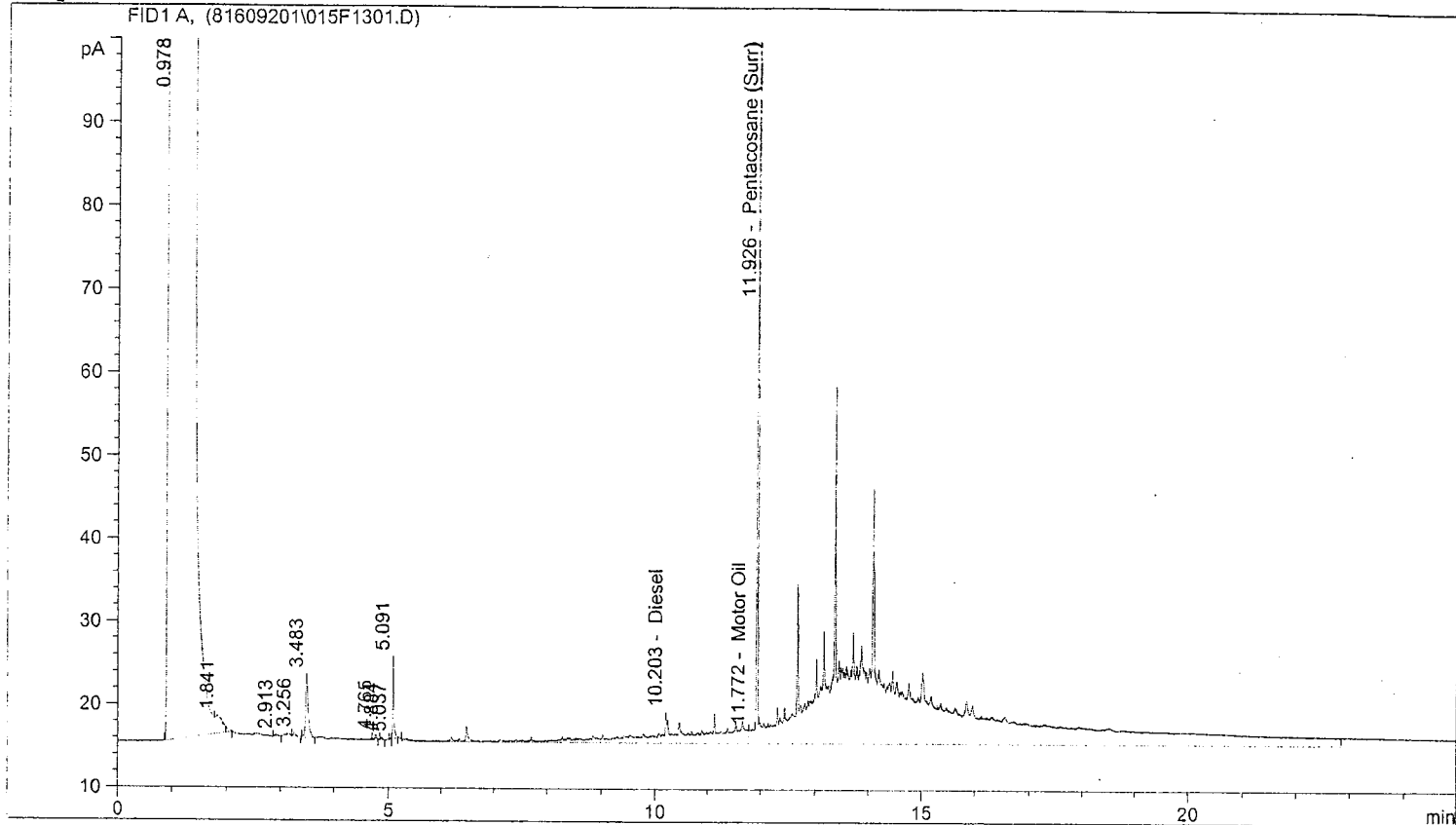
MO = 170 mg/kg Extremely Weathered
 Bunker C or similar

ANALYZED BY *AS*
 DATE *9/20/06*

9-20-06 DC

Instrument #81 Data File: C:\HPCHEM\1\DATA\81609201\015F1301.D
 Operator: DLC
 Method: C:\HPCHEM\1\METHODS\FDMO0106.M
 Injection Date & Time: 9/20/06 2:11:38 PM
 Report Creation: 9/20/06 2:52:59 PM

Sample Name: 609083-9 SGA



Ret. Time	Signal	Compound Name	Response	Amount ug/mL
10.203	FID1 A,	Diesel	227.344	17.738
11.772		Motor Oil	2191.120	181.965
11.926		Pentacosane (Surr)	178.791	11.026

2761g

D < 25 mg/kg

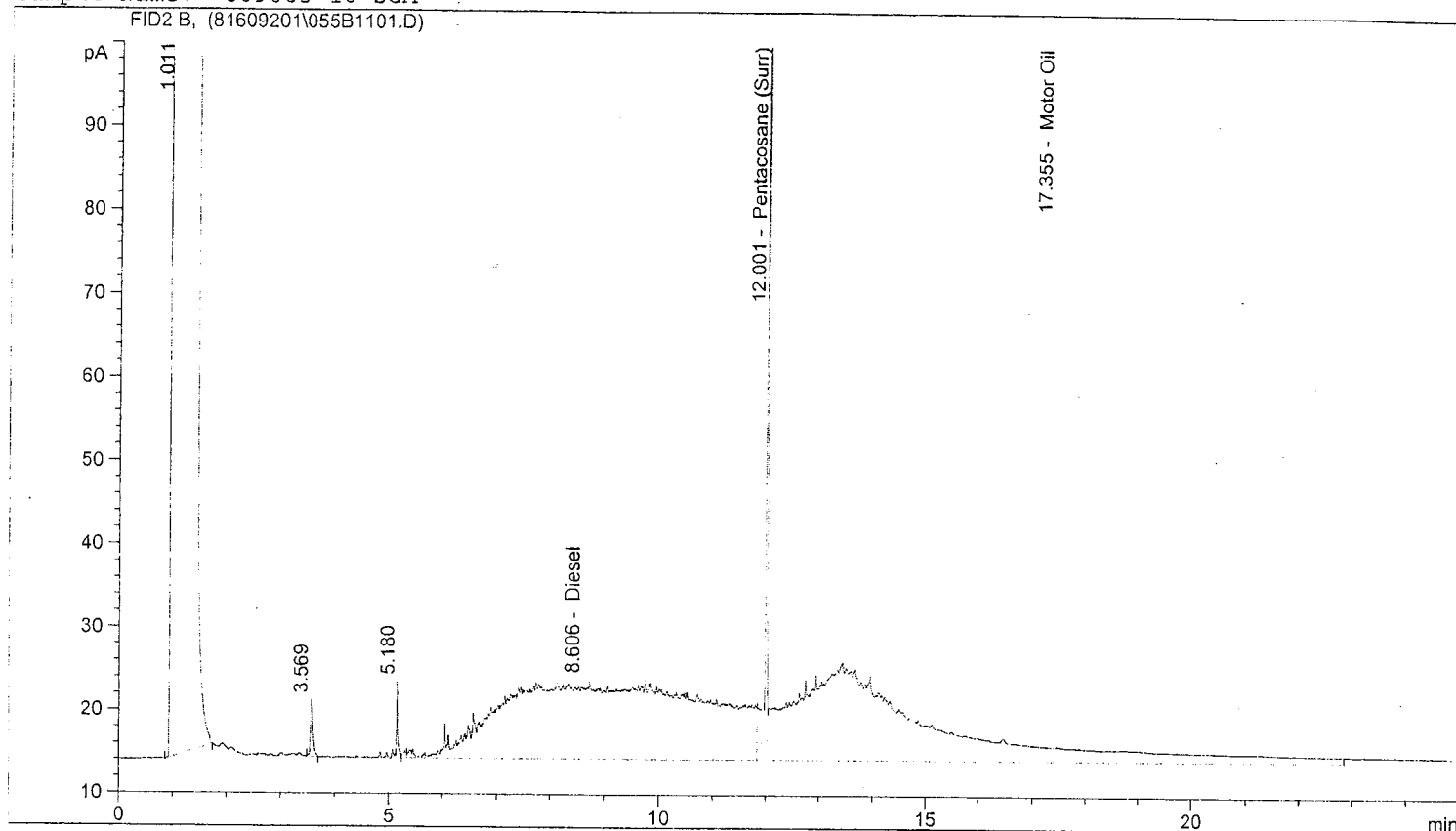
MO = 66 mg/kg Lube Oil

9-20-06 DC

REVIEWED BY *AS*
 & DATE *9/20/06*

Instrument #81 Data File: C:\HPCHEM\1\DATA\81609201\055B1101.D
 Operator: DLC
 Method: C:\HPCHEM\1\METHODS\BDM00806.M
 Injection Date & Time: 9/20/06 1:10:34 PM
 Report Creation: 9/20/06 1:47:04 PM

Sample Name: 609083-10 SGA



Ret. Time	Signal	Compound Name	Response	Amount ug/mL
8.606	FID2 B,	Diesel	2465.046	194.867
12.001		Pentacosane (Surr)	160.712	10.226
17.355		Motor Oil	2177.481	191.661

26.65g

D = 73 mg/kg

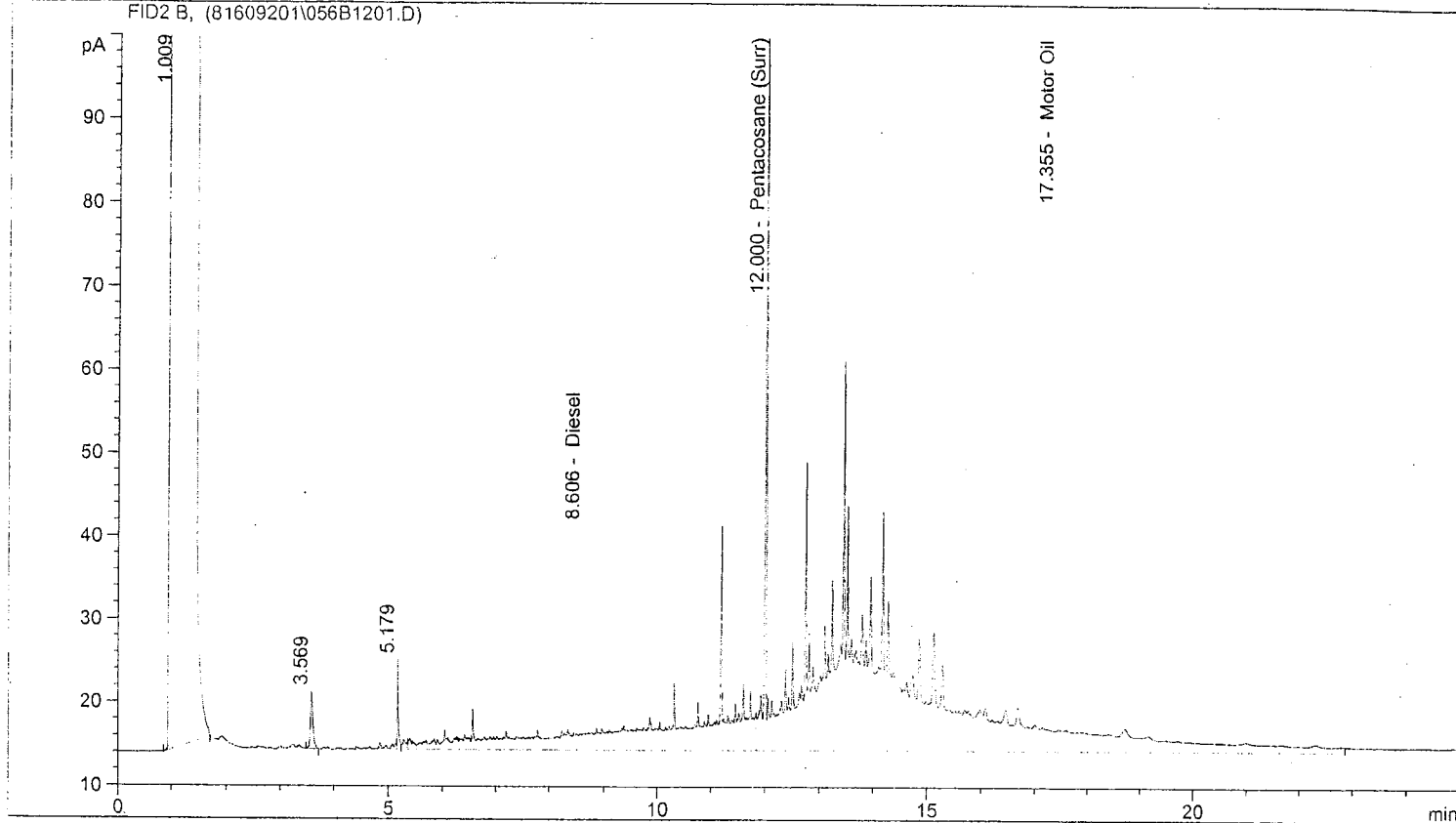
MO = 72 mg/kg Bunker C or similar

9-20-06 DC

ANALYZED BY AB
 DATE 9/20/06

Instrument #81 Data File: C:\HPCHEM\1\DATA\81609201\056B1201.D
 Operator: DLC
 Method: C:\HPCHEM\1\METHODS\BDM00806.M
 Injection Date & Time: 9/20/06 1:41:07 PM 9/20/06 1:41:07 PM
 Report Creation: 9/20/06 2:30:47 PM

Sample Name: 609083-11 SGA
 FID2 B, (81609201\056B1201.D)



Ret. Time	Signal	Compound Name	Response	Amount ug/mL
8.606	FID2 B,	Diesel	851.890	64.828
12.000		Pentacosane (Surr)	162.401	10.337
17.355		Motor Oil	2819.666	255.128

25.68g

D < 25 mg/kg

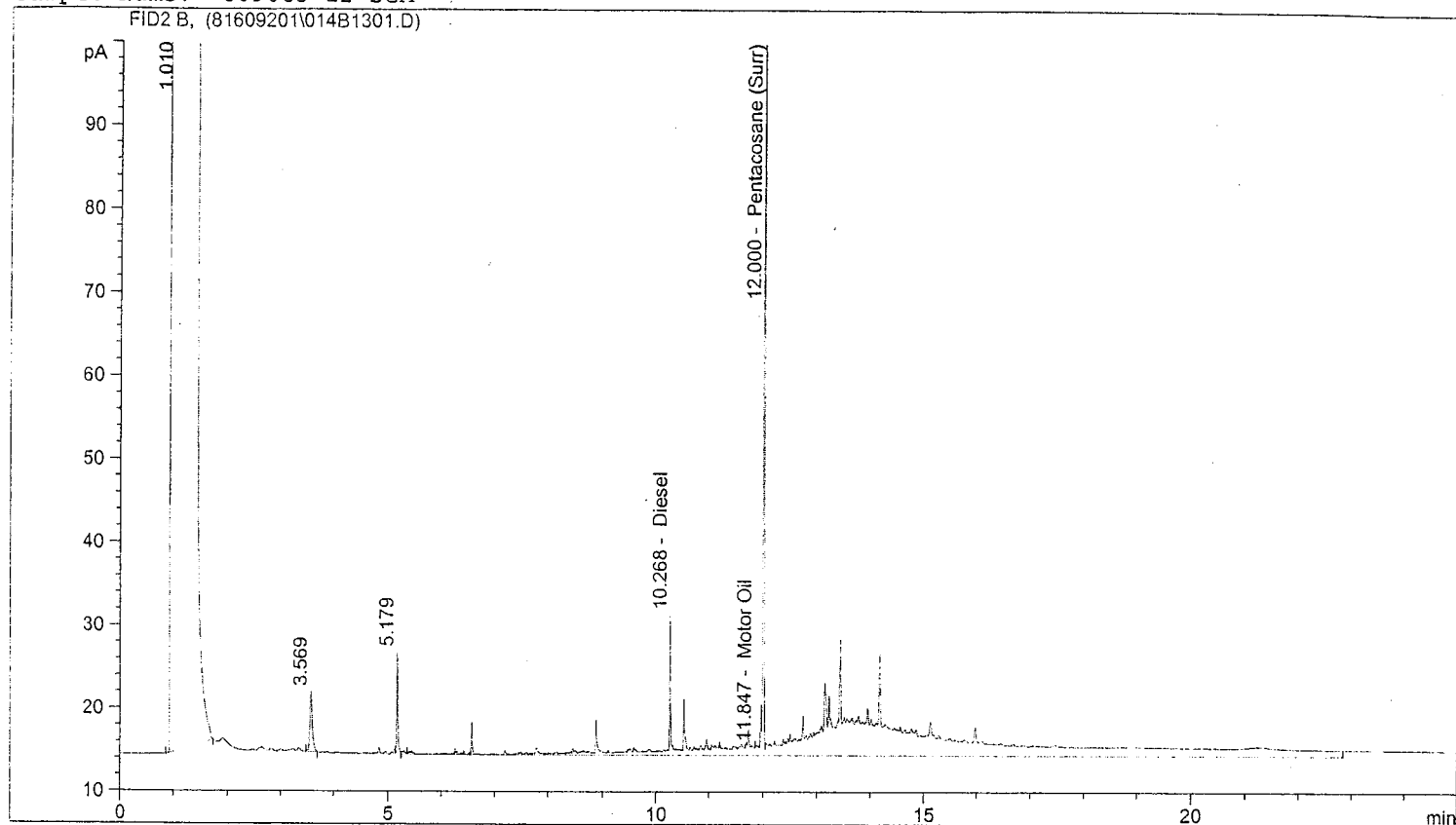
MO = 99 mg/kg Lube Oil

9-20-06 DC

REVIEWED BY *DB*
 DATE *9/20/06*

Instrument #81 Data File: C:\HPCHEM\1\DATA\81609201\014B1301.D
 Operator: DLC
 Method: C:\HPCHEM\1\METHODS\BDMO0806.M
 Injection Date & Time: 9/20/06 2:11:38 PM 9/20/06 2:11:38 PM
 Report Creation: 9/20/06 2:54:12 PM

Sample Name: 609083-12 SGA



Ret. Time	Signal	Compound Name	Response	Amount ug/mL
10.268	FID2 B,	Diesel	207.672	12.897
11.847		Motor Oil	1161.874	91.288
12.000		Pentacosane (Surr)	162.360	10.334

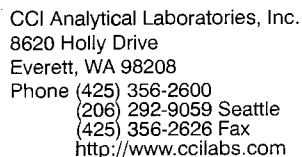
22.05g

D < 25 mg/kg

MO < 50 mg/kg

9-20-06 DC

ANALYZED BY *10*
 DATE *9/20/06*



Chain Of Custody/ Laboratory Analysis Request

CCI Job# (Laboratory Use Only)

Date 9/19/06 Page 1 Of 3

PROJECT ID: Former Fire Pit SCA					ANALYSIS REQUESTED															OTHER (Specify)																					
REPORT TO COMPANY: CDM																																									
PROJECT MANAGER: Pam Morrill																																									
ADDRESS: Bellevue, WA																																									
PHONE: FAX:																																									
P.O. NUMBER: E-MAIL:																																									
INVOICE TO COMPANY:																																									
ATTENTION:																																									
ADDRESS:																																									
SAMPLE I.D.					DATE					TIME					TYPE					LAB#																					
1. WC-1					9/19/06					0900					SOIL					1																					
2.																																									
3.																																									
4.																																									
5.																																									
6.																																									
7.																																									
8.																																									
9.																																									
10.																																									

SPECIAL INSTRUCTIONS

CCI Analytical Laboratories, Inc accepts and processes this request on the terms and conditions set forth on the reverse side. By its signature hereon, Customer accepts these terms and conditions.

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: Nicholas J. Simon, CDM, 9/19/06, 1620

Received By: Carl A. O'Connell 9/19/06 1620

2. Relinquished By:

Received By:

TURNAROUND REQUESTED in Business Days*

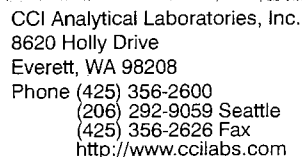
OTHER:

Specify: STD. TURNAROUND
FOR THIS SAMPLE ONLY
(WC-1)

Organic, Metals & Inorganic Analysis

10 5 3 2 1 SAME DAY

Fuels & Hydrocarbon Analysis



CCJ Job# (Laboratory Use Only)

Date 9/19/06 Page 2 Of 3

[illegible]

SPECIAL INSTRUCTIONS

CCI Analytical Laboratories, Inc accepts and processes this request on the terms and conditions set forth on the reverse side. By its signature hereon, Customer accepts these terms and conditions.

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: Nicholas J. Simon, CDM, 9/19/06, /620

Received By: Carl W. OC 2 9/19/06 1620

2. Relinquished By: _____

Received By: _____

TURNAROUND REQUESTED in Business Days*

OTHER:

Specify: 24 hr TAT

$(CS) \rightarrow (CS-11)$

Organic, Metals & Inorganic Analysis

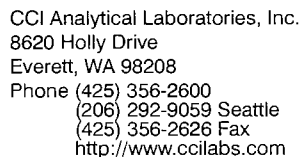
10 5 3 2 1 SAME DAY

Fuels & Hydrocarbon Analysis

5 3 1 ~~GAME DAY~~

Standard

* Turnaround request less than standard may incur Rush Charges



CCl Job# (Laboratory Use Only)

Date 9/19/06 Page 3 Of 3

[illegible]

SPECIAL INSTRUCTIONS

CCI Analytical Laboratories, Inc accepts and processes this request on the terms and conditions set forth on the reverse side. By its signature hereon, Customer accepts these terms and conditions.

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: Nicholas J. Demers, CDM, 9/19/06, 1620

Received By: Cher H. [Signature] 7/19/06 1620

2. Relinquished By: _____

Received By: _____

TURNAROUND REQUESTED in Business Days*

OTHER:

Specify: 24 hr TAT

$$I(CS:1 \Rightarrow CS:11)$$

Organic, Metals & Inorganic Analysis

10 5 3 2 1 SAME DAY

Fuels & Hydrocarbon Analysis

* Turnaround request less than standard may incur Rush Charges



consulting • engineering • construction • operations

Appendix B

2018 PFAS Investigation Report

CONTENTS

- FTP PFAS investigation, Snohomish County Airport, Everett, Washington: Report prepared by CDM Smith, Bellevue, Wash., for Snohomish County Public Works, Everett, Wash., project no. 19947-230030, October 29, 2018.

FINAL

Former Fire Pit PFAS Investigation
Snohomish County Airport
Everett, Washington

Snohomish County Public Works
3000 Rockefeller Ave., M/S 607
Everett, WA 98201-4046

October 29, 2018

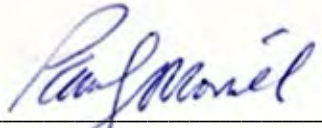


A Report Prepared For:

Snohomish County Public Works
300 Rockefeller Ave., M/S 607
Everett, Washington 98201-40465

**FINAL
FORMER FIRE PIT PFAS INVESTIGATION
SNOHOMISH COUNTY AIRPORT
EVERETT, WASHINGTON**

October 29, 2018



Pamela J. Morrill, LG, LHG
Project Manager



**CDM
Smith**

14432 SE Eastgate Way, Suite 100
Bellevue, Washington 98007
425/519-8300

CDM Smith Project No. 19947-230030

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Appendices

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Acronyms

AFFF	aqueous film-forming foam
AGI	AGI Technologies Inc. (now CDM Smith Inc.)
ATSD	Agency for Toxic Substances and Disease Registry
bgs	below ground surface
CDM	Camp Dresser & McKee Inc. (now CDM Smith Inc.)
DPT	direct-push technology
Ecology	Washington State Department of Ecology
EPA	Environmental Protection Agency
HDPE	high density polyethylene
ITRC	Interstate Technology Regulatory Council
OPRS	ongoing precision and recovery standards
PFAA	perfluoroalkyl acids
PFAS	polyfluoroalkyl substances
PFHxS	perfluorohexanesulfonate
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PVC	polyvinyl chloride
ml	milliliter
MSL	mean seal level
MTCA	Model Toxics Control Act
NFA	No Further Action
ng/g	nanograms per gram (parts per trillion)
ng/L	nanograms per liter (parts per trillion)
SCA	Snohomish County Airport
SGS AXYS	SGS AXYS Analytical Services Ltd
SOP	standard operating procedure
USCS	Unified Soil Classification System
VOC	volatile organic compound

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Executive Summary

This report presents the results of an investigation into the presence of per- and polyfluoroalkyl substances (PFAS) in soil and groundwater associated with the former use of aqueous film-forming foam (AFFF) at the former Fire Pit located at Snohomish County Airport (SCA) – Paine Field. Snohomish County Airport retained CDM Smith Inc. (CDM Smith) to perform this investigation in accordance with our May 4, 2018 proposal, Task Assignment #9, Master Agreement No. OCC15/1-8.9(M) On-Call Consultant Services for Environmental Site Assessment with Snohomish County Public Works Department. The following summary is intended to be used within the context of the entire report.

The Fire Pit was used by the SCA Fire Department, Boeing Fire Department, Snohomish County District 1 and 11 Fire Departments, and potentially other fire departments for training exercises. During these exercises the Fire Pit was partially filled with water. Petroleum fuel and potentially other flammable waste chemical mixes were added to the water and set on fire. The flames were then extinguished using AFFF. PFOS-based AFFF were developed in the 1960s. The use of PFAS in AFFF gives these mixtures a low surface tension and ability to spread; this makes it particularly effective against flammable liquid fires when mixed with water.

During this investigation, CDM Smith extended a total of six boreholes using direct-push technology (DPT) methods. One borehole was situated within the former Fire Pit. Four boreholes were situated at relatively even spacing (approximately 40 to 60 feet) to the north, south, east and west of the former Fire Pit. A sixth boring was situated in the inferred downgradient direction, approximately 200 feet west of the former Fire Pit. Soil samples were collected from the boring situated within the former Fire Pit for laboratory analysis. Groundwater sample collection was planned for each of the six borings. However, groundwater was not observed at borings FP4 through FP6. Since this investigation was conducted in mid-August, at the end of a particularly dry summer, this likely represents the seasonal low groundwater conditions. Groundwater samples were collected from FP1 through FP3 and submitted for laboratory analysis.

PFAS compounds were detected in all soil and groundwater samples analyzed. Ecology currently has not yet established soil and groundwater cleanup levels for PFAS. The EPA lifetime health advisory level in drinking water is 70 nanograms per liter (ng/L) for the two specific PFAS compounds, perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), combined or for either separately. Concentrations of PFOA and PFOS detected in all three groundwater samples were substantially greater than the EPA advisory level, with a maximum concentration of 33,300 ng/L reported for PFOS and 508 ng/L for PFOA. The PFAS compounds detected are consistent with the historical use of AFFF at the Fire Pit, in particular, PFOS-base AFFF. The presence of high concentrations of PFAS compounds in groundwater samples beyond the limits of the former Fire Pit indicate migration of these contaminants have occurred. However, the extent of the contaminant plume is not known.

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Section 1

Introduction

This report presents the results of an investigation into the presence of per- and polyfluoroalkyl substances (PFAS) in soil and groundwater associated with the former use of aqueous film-forming foam (AFFF) at the former Fire Pit located at Snohomish County Airport (SCA) – Paine Field. Snohomish County Airport retained CDM Smith Inc. (CDM Smith) to perform this investigation in accordance with our May 4, 2018 proposal, Task Assignment #9, Master Agreement No. OCC15/1-8.9(M) On-Call Consultant Services for Environmental Site Assessment with Snohomish County Public Works Department.

1.1 Site Location and Description

The former Fire Pit is located at the southwest corner of Snohomish County Airport – Paine Field, Everett, Washington (**Figure 1**). The Fire Pit was an approximately 40- by 80-foot oval depression about 1 to 2 feet deep located adjacent to Taxiway K-5. **Figure 2** shows the approximate layout of the former Fire Pit with regard to surrounding features. The area of the former Fire Pit is currently relatively level and grass-covered. The general area is bound by the northeast-southwest trending Taxiway K-5 on the east, Taxiway K-6 and a service ramp to the south, and a narrow, paved perimeter access road on the west. The perimeter access road and grassy field also extend northward.

1.2 Site History

The Fire Pit was used by the SCA Fire Department, Boeing Fire Department, Snohomish County District 1 and 11 Fire Departments, and potentially other fire departments for training exercises. During these exercises the Fire Pit was partially filled with water. Petroleum fuel and potentially other flammable waste chemical mixes were added to the water and set on fire. The flames were then extinguished using AFFF. In 1989 Dames & Moore completed a contamination and geotechnical assessment of the Fire Pit. At that time, the surface water in the pit was sampled and submitted for laboratory analysis of dissolved petroleum hydrocarbons (free phase petroleum product was reported to exist), volatile organic compounds (VOCs), and metals (AGI Technologies [now CDM Smith], 1998a). During the analysis for VOCs the sample was noted as having been diluted by 1,000 due to “foaming” (AGI Technologies, 1998a).

In 1998 CDM Smith (formerly AGI Technologies) conducted a contamination assessment of the Fire Pit, which included collection of groundwater, surface water, and soil samples for analysis of petroleum hydrocarbons, VOCs, and metals. This assessment identified diesel- and oil-range petroleum hydrocarbons and lead in soils at concentrations that exceeded Model Toxics Control Act (MTCA) Method A cleanup levels in effect at that time (AGI Technologies, 1998a).

In September 2006, CDM Smith (formerly Camp Dresser & McKee Inc. [CDM]) conducted a remedial excavation for diesel- and oil-range petroleum hydrocarbon and lead-impacted soils. This effort involved excavation of approximately 170 cubic yards of soil from the Fire Pit and disposal at an offsite facility (CDM, 2007). Confirmation soil samples collected from the

excavation limits showed compliance with MTCA Method A unrestricted land use-based cleanup levels for petroleum hydrocarbons and lead (CDM, 2007). In a letter dated June 27, 2007, the Washington State Department of Ecology (Ecology) issued a No Further Action (NFA) determination for the Fire Pit. Following the NFA, the Fire Pit was backfilled and leveled even with the surrounding topography, and the monitoring well was abandoned.

1.3 History and Toxicity of PFAS

Since the completion of soil remedial actions at the site in 2006, awareness has grown regarding the potential health risks associated with PFAS in soil and groundwater. PFAS are a group of over 3,000 synthetic organic chemicals that have been used extensively in surface coating and protectant formulations due to their unique surfactant properties (ASTDR, 2018; ITRC, 2017). Major applications include protectants for paper/cardboard packaging, and carpets, leather, and textile products to enhance water, grease and soil repellency, and in firefighting foams (ASTDR, 2018). Perfluoroalkyls are also used as processing aids in the manufacture of nonstick coatings. (ATSDR, 2018). Perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) are the most widely studied of the PFAS compounds (EPA, 2017).

PFOS-based firefighting foams were developed in the 1960s (ITRC, 2018a). The fluorosurfactants originally produced by the 3M Company and used for AFFF were based on PFOS chemistry (Northeastern University, 2018). The use of PFAS in firefighting foam gives these mixtures a low surface tension and ability to spread; this makes it particularly effective against flammable liquid fires when mixed with water. After extinguishing the fire, a foam-surfactant film acts as both a radiation barrier and a vapor-sealant to prevent re-ignition or “burnback.”

The toxicity, mobility, and bioaccumulation potential of PFOS, PFOA, and other long-chain PFAS result in potential adverse effects on the environment and human health (EPA, 2017). Laboratory studies using animals and epidemiological studies of human populations show that exposure to some PFAS may be associated with a wide range of adverse human health effects (ITRC, 2017). They remain in the environment for a long time. Both biotic and abiotic transformations of some PFAS substances may form perfluoroalkyl acids (PFAA). However, PFAAs likely do not degrade or otherwise transform under ambient environmental conditions. (ASTR, 2018).

Ecology has not yet established soil and groundwater cleanup levels for PFAS. The EPA lifetime health advisory level in drinking water is 70 nanograms per liter (ng/L) for PFOA and PFOS combined or for either separately.

1.4 Purpose and Scope of Work

The purpose of this investigation was to evaluate the potential presence of PFAS in soil and groundwater associated with the prior use of AFFF in the Fire Pit.

CDM Smith’s scope of services consisted of the following:

- Extending six borings using direct-push technology (DPT) sampling methods to collect soil and groundwater samples within and in areas considered hydraulically upgradient, cross gradient and downgradient of the former Fire Pit.

- Submitting collected soil and groundwater samples for laboratory analysis.
- Evaluating the data and preparing this report summarizing our findings.

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Section 2

Environmental Setting

2.1 Regional Geology

SCA is located in the Puget Sound Lowland on an upland glacial terrain feature known as the Intercity Plateau. The Intercity Plateau is a depositional feature of the Vashon glaciation, with incised ravines eroded into its perimeter. The Plateau ranges in elevation from approximately 400 to 600 feet above mean sea level (MSL) and is characterized by low rolling hills. Glacial till and recessional glacial outwash deposits generally mantle the plateau, although in isolated areas recent peat occurs. SCA is generally constructed on glacial till and reworked native sediments.

2.2 Site Geology

CDM Smith (formerly AGI Technologies) explored subsurface conditions at the site and general vicinity during a 1998 environmental assessment and a concurrent geotechnical investigation (AGI, 1998a; AGI, 1998b). Based on conditions encountered during these investigations, we characterized the subsurface soils as follows:

Upper Fill: The upper fill is variable in consistency and is generally composed of very loose to loose, moist to wet silty sand with some gravel, cobbles and occasional organics and wood debris. We interpreted the upper fill as being reworked native glacial till deposits, possibly mixed with construction rubble and grubbings. In several cases, the upper fill was composed of loosely placed, partially cemented till fragments. Upper fill was encountered in all borings to depths ranging from 16 to 24 feet below ground surface (bgs).

Lower Fill: The lower fill is also variable in consistency and is composed of loose to medium dense, saturated silty sand with some gravel and cobbles, but with less organics and wood debris than observed in the upper fill. The lower fill was encountered underlying the upper fill in all borings and ended at depths between approximately 19 and 42 feet bgs.

Till: The till is a native soil deposit composed of dense to very dense, moist to wet sand and silty sand with some gravel and cobbles, and occasional lenses of clean sand. Both weathered and unweathered till was encountered below the lower fill at depths between 19 and 42 feet bgs.

2.3 Groundwater

In general, in the area, perched groundwater occurs within the lower fill on top of the native till deposits. During the prior investigations, the groundwater was encountered at depths ranging between 12.5 and 24 feet bgs. Groundwater tends to fluctuate seasonally in response to precipitation. The groundwater flow direction is estimated to be toward the west, based on topography.

The uppermost aquifer at SCA occurs within the Advance Outwash unit, which occurs below the till. Information for this area of Paine Field suggests that the groundwater is under confined

conditions and that the static water table elevation is about 290 to 350 feet MSL, or about 180 to 240 feet bgs (CDM, 2000; Thomas, et. al., 1997).

Section 3

Field Investigation

CDM Smith's field investigation was conducted on August 14, 2018. The work was conducted in general accordance with our May 4, 2018 proposal and CDM Smith's Standard Operating Procedure (SOP) for sampling PFAS, included as **Appendix A**. However, there were some modifications to the scope of work as dictated by encountered field conditions, such as not being able to collect groundwater samples in every planned location.

A truck-mounted DPT drill rig was utilized to explore subsurface conditions at six boring locations. ESN Northwest was the drilling contractor. A CDM Smith geologist observed the soil borings, logged soil conditions and collected samples for laboratory analysis.

One borehole was situated within the former Fire Pit. Four boreholes were situated at relatively even spacing (approximately 40 to 60 feet) to the north, south, east and west of the former Fire Pit. A sixth boring was situated in the inferred downgradient direction, approximately 200 feet west of the former Fire Pit. The boring locations, numbered FP1 through FP6, are shown on **Figure 3**.

3.1 Soil Sampling

The DPT sampling method utilizes a hydraulically powered percussion direct-push machine that drives a tool string connected to the sample barrel directly into the ground with minimal sample disturbance. Soil samples were collected continuously from the DPT borings using a 5-foot long, 1.5-inch inside diameter core sampler attached to the end of drive rods. The sampler contained a clear acetate liner to contain the soil samples. Upon retrieval, the liners were cut open to expose the soil cores. Each soil unit was logged according to the Unified Soil Classification System (USCS) as described on **Figure B1** in **Appendix B**. Boring logs are also provided in **Appendix B**. Soil in the sample cores was also visually examined for indications of contamination (i.e., discoloration and noticeable odor).

Soil samples to be submitted for analytical testing were collected from boring FP1, located within the former Fire Pit, at depths of 4.5, 10, and 16 feet bgs. Soil samples were collected in laboratory-supplied pre-cleaned 250 milliliter (ml) high density polyethylene (HDPE) jars. Samples were identified by the boring number and approximate sample depth in feet below ground surface (e.g., FP1-4.5).

Sample bottles were labeled with an identification number, date and time of collection, and project number. Soil samples were packed in a chilled cooler and transported under chain-of-custody to the analytical laboratory.

3.2 Groundwater Sampling

Groundwater samples were collected from three DPT borings: FP1, FP2, and FP3. The intention was to also collect groundwater samples at FP4, FP5 and FP6; however, the lack of groundwater at these locations limited groundwater sampling efforts.

Groundwater samples were collected from temporary wells by two methods. At FP1 and FP3 groundwater samples were collected by inserting telescoping steel rods down the borehole and pulling the rods back four feet to expose a stainless-steel screen. At FP2, a ¾-inch diameter PVC casing affixed with a 5-foot length of screen was placed through the drill rods and then retracting the drill rods, temporarily leaving the PVC well in the borehole. The temporary wells pumped dry, so were allowed to stand between 1.5 and 3 hours before sample collection. A peristaltic pump with dedicated polyethylene and silicon tubing were used to withdraw the groundwater through the temporary well screen. Groundwater was discharged directly from the sample tubing into laboratory-supplied pre-cleaned HDPE bottles for sample collection. Sample bottles were labeled with an identification number, date, and time of collection, and project number. Groundwater samples were packed in a cooler chilled with ice.

3.3 Decontamination

One-time use acetate liners were used to collect soil samples and discarded, as was the groundwater sample tubing. Nitrile gloves were worn throughout the field work and were changed out between samples and boreholes.

All nondisposable sampling equipment was decontaminated between boreholes by the following methods.

1. Initial rinse with a pressure washer.
2. Scrub withalconox and water.
3. Rinse with the pressure water.
4. Final rinse with laboratory-supplied certified PFAS free water.
5. The cleaned equipment was laid out on plastic to drain/dry until the next use.

3.3 Quality Control Samples

Three quality control samples were collected as a part of this investigation. “Rinseate-1” was a water sample collected by pumping laboratory-supplied PFAS free water through the cleaned downhole groundwater sampling tooling and unused tubing and capturing the rinse water in laboratory-supplied HDPE sample containers. Rinseate-1 was collected at the initiation of work, before the first groundwater sample was collected. Rinseate-2 was a rinse water sample collected from the downhole soil sample tooling and acetate liner. Rinseate-2 was collected after drilling FP-2 through FP-6 and before drilling FP-1 (where soil samples were collected for analysis). A trip blank supplied by the analytical laboratory also accompanied the samples.

3.4 Borehole Abandonment

Following completion of sampling at each location the DPT boreholes were abandoned. Borehole abandonment consisted of backfilling the borehole with bentonite chips.

3.5 Sample Handling and Shipment

The samples were transported in a chilled cooler back to CDM Smith's Bellevue office where they were held in a locked storage room and padlocked refrigerator over the weekend. The samples were then packed in a cooler chilled with ice and transported under chain-of-custody via overnight Fed-Ex Delivery to SGS AXYS Analytical Services Ltd. (SGS AXYS) in Sidney, British Columbia.

3.6 Laboratory Analysis

SGS AXYS analyzed the soil and groundwater samples by Modified EPA test method 537, referred to as MLA-110. The analytical reports from SGS AXYS is included in **Appendix C**.

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Section 4

Findings and Discussion

4.1 Data Usability Assessment

The analytical reports were reviewed by a CDM Smith chemist for completeness and data quality. Holding times; initial calibration; calibration verification, field and method blanks, recoveries of labeled compounds, and ongoing precision and recovery standards (OPRS) were included in the review of the PFAS data.

4.1.1 Precision

Field duplicates, matrix spikes, and matrix spike duplicates, and laboratory duplicates were not required.

4.1.2 Accuracy

Accuracy was assessed with percent recoveries of labeled compounds and OPRS target compound recoveries, and calibration data. All percent recoveries in the initial calibration, and OPRS met the control limits. All labeled compounds in the groundwater analyses met the control limits. Selected labeled compounds were recovered outside the control limits and qualified with “V” qualifiers by the laboratory in the soil analyses. The laboratory noted that, because the isotope dilution method of quantification used produces data that are recovery corrected, the slight variations from the methods limits were deemed to not affect the quantitation of these isotope dilution analytes. Percent labeled compound recoveries are used as a general method performance indicator only.

Low concentrations of one to three compounds were detected in the field rinsate blanks and laboratory blank. The concentrations reported in the blanks were insignificant in comparison to concentrations detected in the samples.

4.1.3 Representativeness

Representativeness is a qualitative term that expresses the degree to which the sample data accurately and precisely represent the environmental conditions corresponding to the location of sample collection. Field representativeness was attained through the use of an EPA-approved analytical method (EPA 537, version 1.1) with modification to include isotopically labeled surrogate standards for non-drinking water matrices for sample analyses. Analytical requirements and procedures for sample collection are designed to maximize sample representativeness.

Holding times were met for all analyses in all samples.

4.1.4 Sensitivity

The reporting limits achieved for the all samples were adequate to meet the data quality objectives.

4.2 Field Observations

There were no obvious indications of chemical contamination observed during the field investigation, such as odors, discoloration, or sheen. Soils encountered were generally consistent with those encountered during previous investigations, as described in Section 2.2.

The upper fill appears to end between approximately 10 and 16 feet bgs and consists generally of very loose to medium dense gravelly silty and silty gravelly sand and sometimes contained cinders, organics, organic silt, and wood debris. The lower fill extends from below the upper fill to a depth of approximately 20 to 24 feet bgs. The lower fill consists of medium dense to dense gravelly silty sand and medium stiff gravelly sandy silt and tends to contain pockets of soil with diamict-like texture (i.e., reworked glacial till). Weathered till, consisting of gravelly silty sand/gravelly sandy silt was encountered in all borings, except FP4 at depths between 21 and 24 feet bgs. At FP4, refusal occurred at 20 feet bgs, which may indicate the presence of the unweathered till interface.

Groundwater was encountered only at borings FP1, FP2, and FP3 at a depth of approximately 19 feet bgs. Since this investigation was conducted in mid-August, at the end of a particularly dry summer, this likely represents the seasonal low groundwater conditions. During installation of a monitoring well adjacent to the Fire Pit in January 1998, groundwater was encountered at 17.5 feet bgs and the stabilized water table was measured at 15 feet bgs.

4.3 Analytical Results

As noted in Section 1, Ecology currently has not yet established soil and groundwater cleanup levels for PFAS. The EPA lifetime health advisory level in drinking water is 70 ng/L for PFOA and PFOS combined or for either separately. Presently, there are no cleanup standards for soil.

4.3.1 Groundwater

The groundwater analytical results are summarized in **Table 1**. Multiple PFAS compounds were detected in each sample. Of particular note were the concentrations of PFOS, which were 1,310 ng/L in FP3, 4,970 ng/L in FP2, and 33,300 ng/L in FP1. PFOA concentrations were less, but still elevated above the EPA lifetime health advisory level: 115 ng/L in FP3, 508 ng/L in FP2, and 348 ng/L in FP1. Perfluorohexanesulfonate (PFHxS) concentrations were also in the thousands in all three samples, ranging from 2,250 to 5,680 ng/L. These three contaminants are known to be associated with the discharge of PFOS-based AFFF (ITRC, 2018a).

The PFOA/PFOS concentrations in all three groundwater samples greatly exceed the EPA advisory level of 70 ng/L. While FP1 was situated directly in the former Fire Pit, FP2 was situated approximately 60 feet north of the edge of the fire pit, or cross gradient with respect to the inferred direction of groundwater flow. FP3 was located approximately 40 feet east of the edge of the Fire Pit, or upgradient with respect to the inferred direction of groundwater flow.

4.3.2 Soil

The soil analytical results are summarized in **Table 2**. Multiple PFAS were similarly reported in all three soil samples. The PFOS concentrations were the greatest, with concentrations of 716

nanograms per gram (ng/g) in the 4.5-foot sample, 165 ng/g in the 10-foot sample, and 645 ng/g in the 16-foot sample.

4.4 Summary and Discussion

The salient findings from this investigation are presented below:

- The area of investigation, referred to as the Fire Pit, is a known former fire training area where firefighting foam was used. The Fire Pit was active during the time-period when PFOS-based AFFF was on the market.
- Predominant PFAS detected include PFOS, PFHxS, and PFOA, which are indicative of the discharge of PFOS-based AFFF.
- PFOS, PFHxS, and PFOA are extremely resistant to degradation and can be transported through advection in groundwater (ITRC, 2018b).
- Currently, there are no federal or Washington State regulatory standards to determine whether a site with PFAS contamination requires cleanup, nor have best practices for conducting such a cleanup been established. Ecology has begun to develop cleanup levels for PFOA and PFOS, but in the meantime, the EPA health advisory level of 70 ng/L is the standard typically used for comparison.
- At boring location FP-1, located in the center of the former Fire Pit, PFOA and PFOS concentrations in groundwater are present at concentrations one and three orders of magnitude greater than the health advisory level, respectively.
- PFAS compounds were detected in groundwater outside the boundaries of the former fire training area at concentrations of PFOA and PFOS one and two orders of magnitude greater than the health advisory level, respectively.
- The PFAS concentrations at FP-1, along with the presence of elevated concentrations of PFAS compounds in groundwater samples beyond the limits of the former Fire Pit, indicate that both a source and a plume of PFAS groundwater contamination are present and that delineation is not complete.

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Section 5

Conclusions and Recommendations

Elevated concentrations of PFAS compounds exist in soil and groundwater at the site. The PFAS compounds detected are consistent with the historical use of AFFF used in the former Fire Pit. PFOA and PFOS concentrations one and three orders of magnitude greater than the EPA's health advisory level, respectively, were detected in groundwater directly in the former Fire Pit. These concentrations, along with the presence of elevated concentrations of PFAS compounds in groundwater samples beyond the limits of the former Fire Pit, indicate that both a source and a plume of PFAS groundwater contamination are present. The extent of the contaminant plume has not been delineated.

Recommended next steps to evaluate PFAS associated with the former fire pit are as follows:

- Determine the groundwater flow direction and further define hydrologic conditions.
- Delineate the PFAS plume in groundwater.
- Delineate the soil source, including "precursors" – fluorinated compounds that could transform into persistent and mobile perfluorinated compounds, such as PFOS, PFOA, and PFHxS.
- Determine the potential presence of receptors.

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Section 6

Use of this Report

This report was prepared for exclusive use of Snohomish County Airport for this project only. The analyses and conclusions in this report are based on conditions encountered at the time of our field investigation and our experience and professional judgment. CDM Smith cannot be responsible for the interpretation by others of the data contained herein.

We must presume the conditions encountered are representative of area specifically explored. However, you should be aware that subsurface conditions may vary between exploration locations and with time, and unanticipated conditions can and do often occur.

Our work has been performed in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the area. No other warranty, express or implied, is made.

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Section 7

References

ATSDR (Agency for Toxic Substances and Disease Registry). 2018. Toxicological Profile for Perfluoroalkyls. Draft for Public Comment. June.

<https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf>

Technologies (now CDM Smith). 1998a. Contamination Assessment, Fire Pit, Snohomish County Airport, Snohomish County, Washington. Prepared for Snohomish County Public Works Department. Project No. 15,512.306. May 11.

AGI Technologies (now CDM Smith). 1998b. Preliminary Geotechnical Engineering Study. Proposed Kilo Ramp Development, Snohomish County Airport, Mukilteo, Washington. Project No. 15512,307. February 18.5512334. December 29.

EPA. 2017. Technical Fact Sheet – Perfluorooctane Sulfonate (PFOS) and Perfluorooctanoic Acid (PFOA). November.

ITRC (Interstate Technology Regulatory Council). 2017. History and Use of Per- and Polyfluoroalkyl Substances (PFAS). November. <https://pfas-1.itrcweb.org/wp-content/uploads/2017/11/pfas-fact-sheet-history-and-use-11-13-17.pdf>

ITRC. 2018a. Aqueous Film-Forming Foam (AFFF). October. <https://pfas-1.itrcweb.org/wp-content/uploads/2018/10/pfas-fact-sheet-aff-10-3-18.pdf>

ITRC. 2018b. Environmental Fate and Transport for Per- and Polyfluoroalkyl Substances. March. <https://pfas-1.itrcweb.org/wp-content/uploads/2018/03/pfas-fact-sheet-fate-and-transport-3-16-18.pdf>

CDM (now CDM Smith). 2000. Hydrogeologic Setting, Paine Field Area, Everett, Washington Project No. 19947-29702-1

CDM (now CDM Smith). 2007. Soil Excavation Summary Report, Former Fire Pit, Snohomish County Airport, Everett, Washington. Prepared for Snohomish County Public Works Department. Project No. 19947-54248. February 26.

Northeastern University. Per- and Polyfluoroalkyl Substances . Aqueous Film-Forming Foam (AFF). At: <https://pfasproject.com/aqueous-film-forming-foam-aff/>

Thomas, B.E, Wilkinson, J.M., Embray, S.S. 1997. The Ground-Water System and Ground-Water Quality in Western Snohomish County. U.S. Geological Survey. Water Resources Investigation Report 96-4312.

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Tables

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Table 1
Summary of Perfluorinated Compounds in Groundwater
Paine Field Former Fire Pit
Everett, Washington

Compound	Sample ID													
	FP1-GW		FP2-GW		FP3-GW		Trip blank		RINSATE -1		RINSATE -2		Lab Bank	
	Reported Concentration	Reporting Limit	Reported Concentration	Reporting Limit	Reported Concentration	Reporting Limit	Reported Concentration	Reporting Limit	Reported Concentration	Reporting Limit	Reported Concentration	Reporting Limit	Reported Concentration	Reporting Limit
	nanograms per liter (parts per trillion)													
Perfluorobutanoate (PFBA)	UD	138	99.8	13.3	51.8	8.07	U	1.62	U	1.61	U	1.61	U	1.64
Perfluoropentanoate (PFPeA)	292	69	371	6.65	185	4.03	U	0.811	U	0.803	U	0.804	U	0.82
Perfluorohexanoate (PFHxA)	506	34.5	514	3.33	215	2.02	U	0.405	U	0.401	U	0.402	U	0.41
Perfluoroheptanoate (PFHpA)	107	34.5	144	3.33	73.9	2.02	U	0.405	U	0.401	U	0.402	U	0.41
Perfluorooctanoate (PFOA)	348	34.5	508	3.33	115	2.02	U	0.405	0.544	0.401	U	0.402	U	0.41
Perfluorononanoate (PFNA)	1,900	33.7	250	3.24	108	1.97	U	0.396	U	0.392	U	0.392	0.432	0.4
Perfluorodecanoate (PFDA)	UD	33.7	U	3.24	2.95	1.97	U	0.396	U	0.392	U	0.392	U	0.4
Perfluoroundecanoate (PFUnA)	UD	33.7	19.8	3.24	15.8	1.97	U	0.396	U	0.392	U	0.392	U	0.4
Perfluorododecanoate (PFDoA)	UD	33.7	U	3.24	UD	1.97	U	0.396	U	0.392	U	0.392	U	0.4
Perfluorotridecanoate (PFTrDA)	UD	33.7	4.12	3.24	UD	1.97	U	0.396	U	0.392	U	0.392	U	0.4
Perfluorotetradecanoate (PFTeDA)	UD	33.7	U	3.24	UD	1.97	U	0.396	U	0.392	U	0.392	U	0.4
Perfluorobutanesulfonate (PFBS)	523	34.5	758	3.33	363	2.02	U	0.405	U	0.401	U	0.402	U	0.41
Perfluoropentanesulfonate (PFPeS)	943	32	933	3.08	508	1.87	U	0.376	U	0.372	U	0.373	U	0.38
Perfluorohexanesulfonate (PFHxS)	5,680	34.5	5,430	3.33	2,250	2.02	U	0.405	U	0.401	U	0.402	U	0.41
Perfluoroheptanesulfonate (PFHpS)	304	32	563	3.08	77.8	4.1	U	0.376	U	0.372	U	0.373	U	0.38
Perfluorooctanesulfonate (PFOS)	33,300	34.5	4,970	3.33	1,310	2.02	U	0.405	0.749	0.401	0.576	0.402	U	0.41
Perfluorononanesulfonate (PFNS)	UD	32	U	3.08	UD	1.87	U	0.376	U	0.372	U	0.373	U	0.38
Perfluorodecanesulfonate (PFDS)	UD	34.5	U	3.33	UD	2.02	U	0.405	U	0.401	U	0.402	U	0.41
Perfluorododecanesulfonate (PFDoS)	UD	32	U	3.08	UD	1.87	U	0.376	U	0.372	U	0.373	U	0.38
4:2 fluorotelomersulfonate (4:2 FTS)	UD	135	U	13	UD	7.87	U	1.58	U	1.57	U	1.57	U	1.6
6:2 fluorotelomersulfonate (6:2 FTS)	131	121	205	11.7	181	7.08	U	1.42	U	1.41	U	1.41	U	1.44
8:2 fluorotelomersulfonate (8:2 FTS)	UD	135	U	13	UD	7.87	U	1.58	U	1.57	U	1.57	U	1.6
N-Methylperfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	UD	34.5	4.76	3.33	13.4	2.02	U	0.405	0.441	0.401	U	0.402	U	0.41
N-Methylperfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	UD	38.7	U	3.73	UD	2.26	U	0.455	U	0.45	U	0.451	U	0.46
Perfluorooctanesulfonamide (PFOSA), a.k.a FOSA	UD	84.2	U	8.11	UD	4.92	U	0.989	U	0.979	U	0.981	U	1
N-Methylperfluorooctanesulfonamide (N-MeFOSA)	UD	33.7	U	3.24	UD	1.97	U	0.396	U	0.392	U	0.392	U	0.4
N-Ethylperfluorooctanesulfonamide (N-EtFOSA)	UD	33.7	U	3.24	UD	1.97	U	0.396	U	0.392	U	0.392	U	0.4
N-Methylperfluorooctanesulfonamidoethanol (N-MeFOSE)	UD	344	U	33.1	UD	20.1	U	4.03	U	3.99	U	4	U	4.08
N-Ethylperfluorooctanesulfonamidoethanol (N-EtFOSE)	UD	258	U	24.8	UD	15	U	3.03	U	3	U	3	U	3.06

Notes:
Bolded values - reported concentration in the sample.
U - Analyte not detected at the listed concentration
UD - Analyte not detected at the listed concentrations. Reporting limit elevated due to dilution.
Analytes reported to the lowest calibration level equivalent.

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Table 2
Summary of Perfluorinated Compounds in Soil

Paine Field Former Fire Pit
Everett, Washington

Compound	Sample ID (Boring Location and Depth)							
	FP1-4.5		FP1-10		FP1-16		Lab Blank	
	Reported Concentration	Reporting Limit	Reported Concentration	Reporting Limit	Reported Concentration	Reporting Limit	Reported Concentration	Reporting Limit
	nanograms per gram (parts per trillion)							
Perfluorobutanoate (PFBA)	U	0.864	U	0.864	U	0.934	U	0.82
Perfluoropentanoate (PFPeA)	U	0.432	U	0.432	U	0.467	U	0.41
Perfluorohexanoate (PFHxA)	1.87	0.216	1.45	0.216	1.45	0.234	U	0.205
Perfluoroheptanoate (PFHpA)	0.477	0.216	U	0.216	U	0.234	U	0.205
Perfluorooctanoate (PFOA)	5.07	0.216	1.52	0.216	1.85	0.234	U	0.205
Perfluorononanoate (PFNA)	38.2	0.211	6.9	0.211	15.2	0.228	0.616	0.2
Perfluorodecanoate (PFDA)	1.83	0.211	0.296	0.211	0.982	0.228	U	0.2
Perfluoroundecanoate (PFUnA)	5.63	0.211	3.42	0.211	14.7	0.228	U	0.305
Perfluorododecanoate (PFDoA)	U	0.211	0.304	0.211	0.991	0.228	U	0.2
Perfluorotridecanoate (PFTrDA)	2.09	0.211	10.3	0.211	24.1	0.228	U	0.2
Perfluorotetradecanoate (PFTeDA)	U	0.211	0.235	0.211	0.433	0.228	U	0.2
Perfluorobutanesulfonate (PFBS)	0.631	0.216	0.562	0.216	0.271	0.234	U	0.205
Perfluoropentanesulfonate (PFPeS)	1.36	0.2	0.821	0.2	0.677	0.216	U	0.19
Perfluorohexanesulfonate (PFHxS)	19.2	0.216	10.9	0.216	9.69	0.234	U	0.205
Perfluoroheptanesulfonate (PFHpS)	2.06	0.2	0.815	0.2	1.38	0.216	U	0.19
Perfluorooctanesulfonate (PFOS)	716	1.08	165	0.216	645	0.234	U	0.205
Perfluorononanesulfonate (PFNS)	2.09	0.2	0.491	0.2	1.64	0.216	U	0.19
Perfluorodecanesulfonate (PFDS)	U	0.216	U	0.216	0.331	0.234	U	0.205
Perfluorododecanesulfonate (PFDoS)	U	0.2	U	0.2	U	0.216	U	0.19
4:2 fluorotelomersulfonate (4:2 FTS)	U	0.843	U	0.843	U	0.911	U	0.8
6:2 fluorotelomersulfonate (6:2 FTS)	U	0.759	U	0.759	1.26	0.82	U	0.72
8:2 fluorotelomersulfonate (8:2 FTS)	1.06	0.843	U	0.843	6.64	0.911	U	0.8
N-Methylperfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	0.872	0.216	2.76	0.216	8.38	0.234	U	0.205
N-Methylperfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	U	0.242	U	0.242	U	0.262	U	0.23
Perfluorooctanesulfonamide (PFOSA), a.k.a FOSA	U	0.527	U	0.527	U	0.57	U	0.5
N-Methylperfluorooctanesulfonamide (N-MeFOSA)	U	0.211	U	0.211	U	0.228	U	0.2
N-Ethylperfluorooctanesulfonamide (N-EtFOSA)	U	0.211	U	0.211	U	0.228	U	0.2
N-Methylperfluorooctanesulfonamidoethanol (N-MeFOSE)	U	2.15	U	2.15	U	2.32	U	2.04
N-Ethylperfluorooctanesulfonamidoethanol (N-EtFOSE)	U	1.61	U	1.61	U	1.74	U	1.53

Notes:

Bolded values - reported concentration in the sample.

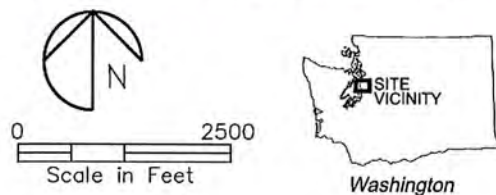
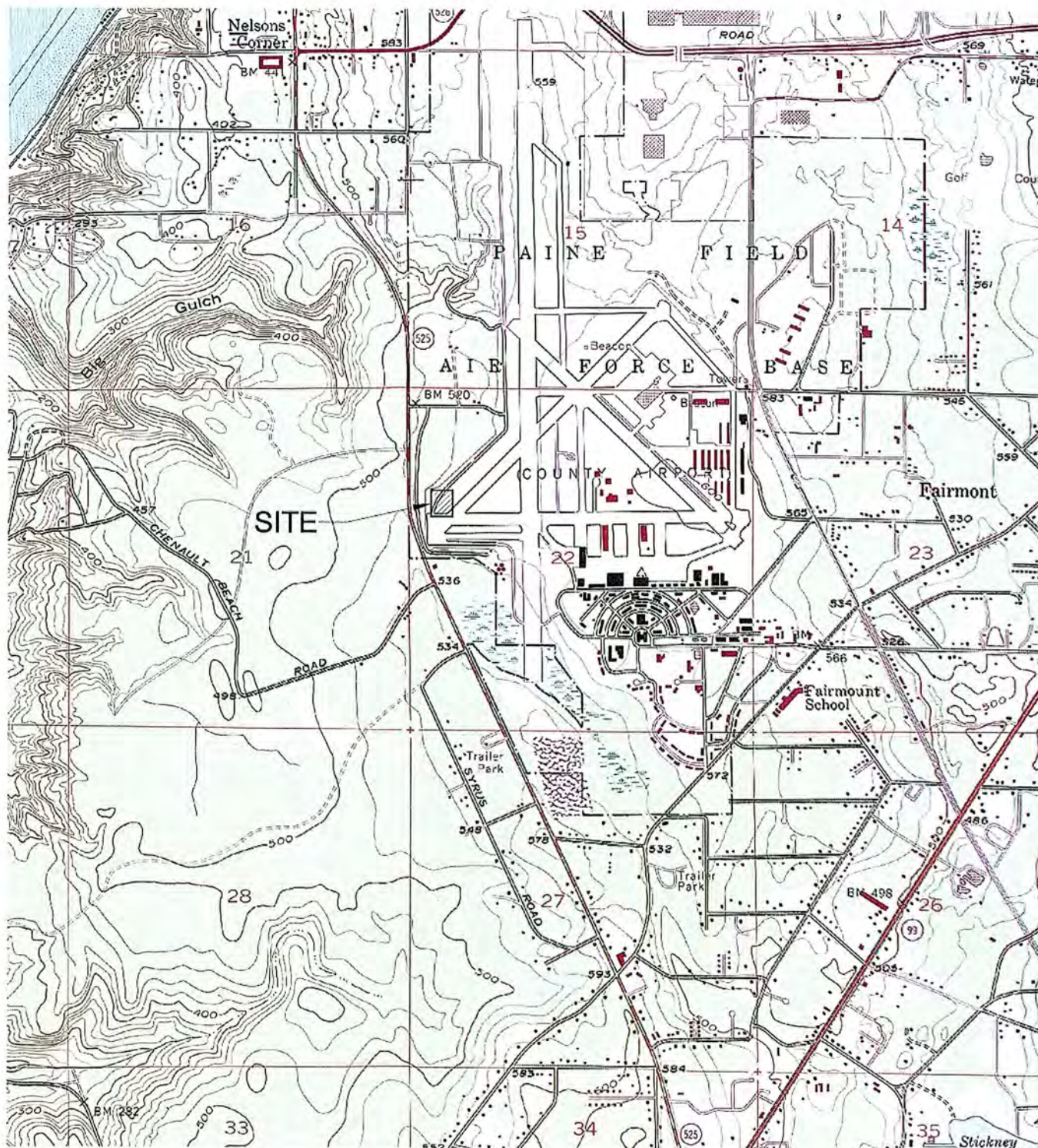
U - Analyte not detected at the listed concentration

Analytes reported to the lowest calibration level equivalent.

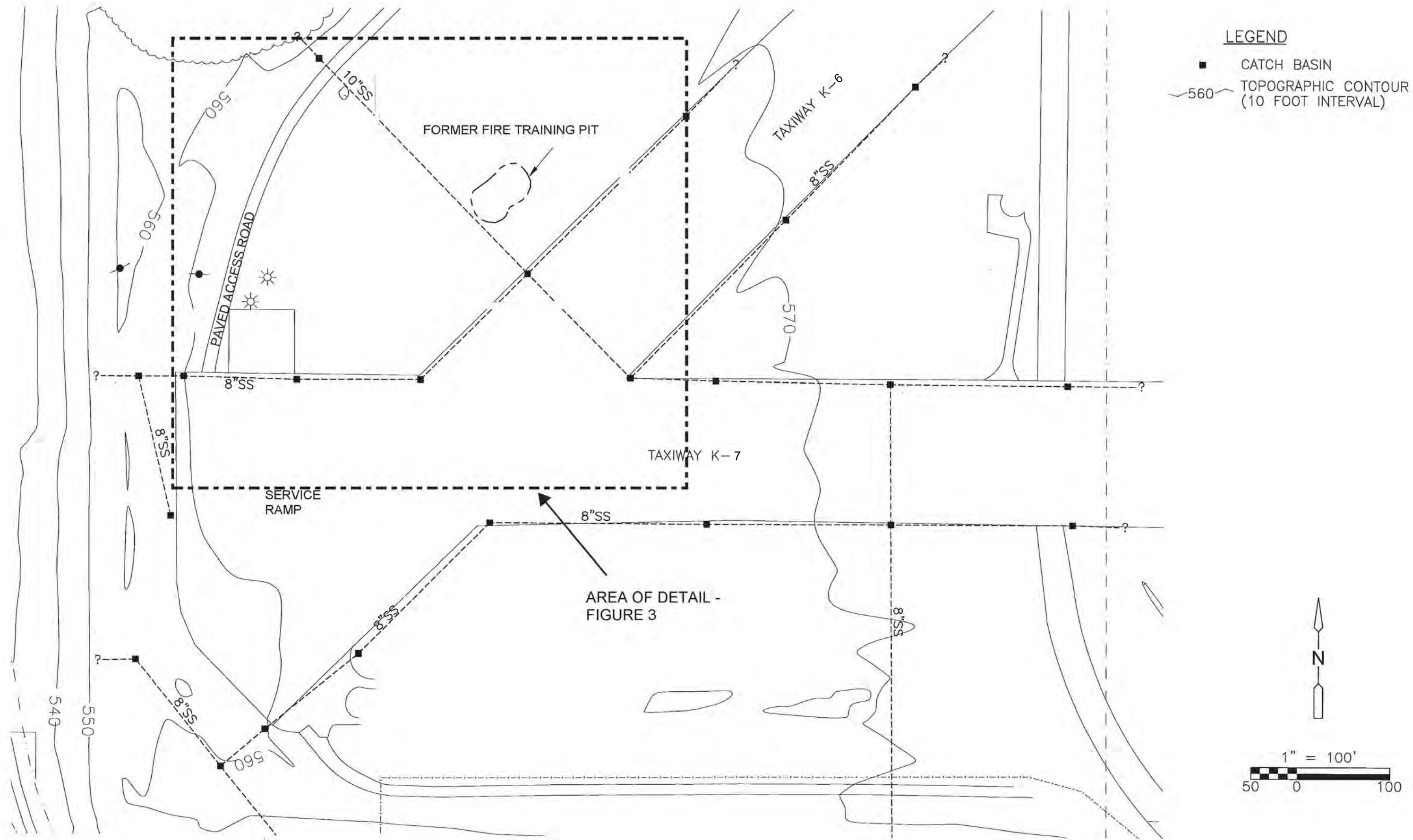
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Figures

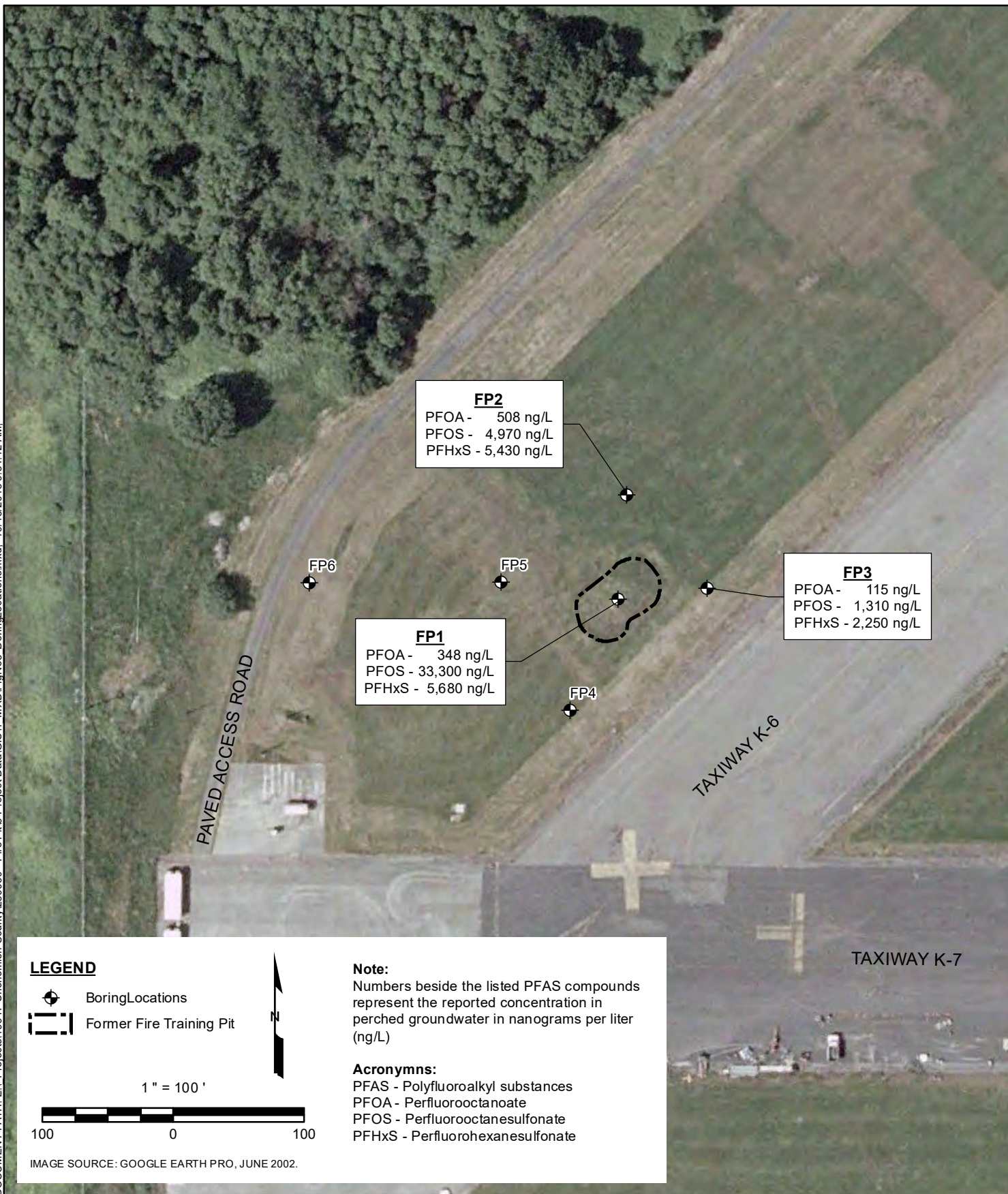
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Appendix A

PFAS Sampling SOP

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1.0 Objective

The objective of this technical standard operating procedure (SOP) is to define the techniques and requirements for PFAS sampling. Techniques discussed in this SOP include field sampling and preservation methods using the protocols intended to be analyzed for per- and polyfluoroalkyl substances (PFAS) by Modified (Low Level) Test Method 537. Sampling and analytical methods for PFAS may change based on technological advancement. Any changes will be submitted as an amendment for approval by VT DEC and USEPA. The list of PFAS is shown on the attached table.

2.0 Background

2.1 Discussion

Specialized techniques and procedures are used for collecting and analyzing samples for PFAS. The field procedures are outlined in the following sections showing restricted equipment and materials that can be used when sampling for PFAS. The Modified (Low Level) Test Method 537 provides PFAS results with reporting limits of approximately 2 nanograms per liter. Acceptable materials for sampling include: stainless steel, high density polyethylene (HDPE) and polypropylene. Additional materials may be acceptable if proven not to contain PFAS. NOTE: Grundfos pumps and bladder pumps are known to contain PFC materials (e.g. Teflon™ washers for Grundfos pumps and low-density polyethylene (LDPE) bladders for bladder pumps). Selection of sampling devices must be carefully researched. All sampling equipment components and sample containers should not come in contact with aluminum foil, LDPE, glass or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer. Standard two step decontamination using detergent and clean water rinse should be considered for equipment that does come in contact with polyfluorinated materials. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with polyfluorinated materials must be avoided. Many food and drink packaging materials and “plumbers thread seal tape” contain PFAS. All clothing worn by sampling personnel must have been laundered multiple times and dried without using dryer sheets of any type. The sampler must wear nitrile gloves while filling and sealing the sample bottles. Pre-cleaned sample bottles with closures, coolers, ice, sample labels and a chain of custody form will be provided by the laboratory.

There are special laboratory requirements and sample coolers are clearly identified for PFAS sampling. This SOP outlines the sampling procedure typically used to collect PFAS samples for analysis.

2.2 Associated Procedures

- SOP 1-2, *Sample Custody*
- SOP 1-12, *Low-Stress (Low-Flow) Groundwater Sampling*
- SOP 2-1, *Packaging and Shipping Environmental Samples*
- SOP 2-2, *Guide to Handling Investigation-Derived Waste*
- SOP 4-1, *Field Logbook Content and Control*
- SOP 4-2, *Photographic Documentation of Field Activities*
- SOP 4-3, *Well Development and Purging*
- SOP 4-5, *Field Equipment Decontamination at Nonradioactive Sites*

3.0 General Responsibilities

Site Manager – The site manager is responsible for ensuring that field personnel are trained in the use of this procedure and the required equipment, and for ensuring that PFAS samples are collected in accordance with this procedure and any other SOPs pertaining to specific media sampling. The site manager must also ensure that the quantity and location of PFAS samples collected meet the requirements of the site-specific sampling and/or work plans.

Field Team Leader – The field team leader is responsible for ensuring that field personnel collect PFAS samples in accordance with this SOP and other relevant procedures.

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Note: All field team member responsibilities are defined in the project-specific quality assurance project plan (QAPP).

4.0 Recommended and Prohibited Field Equipment

4.1 Recommended

- Site-specific plans (e.g., sampling, work, health and safety)
- HDPE and Silicon materials including tubing, bailers, tape, plumbing paste
- Loose paper
- Masonite or Aluminum Clipboard
- pens
- Insulated cooler(s) provided by lab with sample containers
- Cotton construction is recommended for field clothing and should be laundered a minimum of 6 times from time of purchase due to possible PFAS related treatments. Fabric softener and dryer sheets must be avoided. Rain gear should be made from polyurethane and wax-coated materials
- Plastic zip-top bags
- Decontamination supplies – Alconox®/Liquinox®
- Sample chain-of-custody forms
- Custody seals
- Nitrile or appropriate gloves
- Lab supplied and verified “PFAS Free” water to be used for trip and decontamination blanks and decontamination procedures
- Bags of ice
- Labels and appropriate forms/documentation for sample shipment provided by Laboratory

4.2 Prohibited

- Teflon®-containing materials, when possible, should be avoided (e.g., tubing, bailers, tape, and plumbing paste). In cases where Teflon® -containing materials are unavoidable, ensure adequate purging is performed prior to sampling (e.g., in-well pumps) and/or rinse blanks are collected prior to sampling.
- Paper products such as waterproof field books, plastic clipboards, binders, spiral hard cover notebooks, sticky notes or glue materials
- Water resistant, waterproof, stain-treated clothing or shoes including Gore-Tex™ and Tyvek® materials
- LDPE or polypropylene containing materials (e.g., bags or containers used to transport samples)
- Markers
- Chemical (blue) ice packs
- Decontamination soaps containing fluoro-surfactants such as Decon 90
- Water that is not verified to be “PFAS-free” to be used for trip and decontamination blanks and decontamination processes
- Plastic zip-top bags

4.3 Shallow Soil Sampling Equipment

Acceptable materials for sampling include: stainless steel, HDPE and polypropylene. Additional materials may be acceptable if proven not to contain PFAS. All sampling equipment components and sample containers **should not** come in contact with aluminum foil, LDPE, glass or PTFE, Teflon™ materials including sample bottle cap liners with a PTFE layer. A list of acceptable equipment is provided below, but other equipment may be considered appropriate at a later date.

- stainless steel spoon
- stainless steel bowl
- carbon steel hand auger without any coatings

5.0 Procedures

5.1 Preparation

1. Review site-specific health and safety plan and project plans before initiating sampling activity.
2. Don the appropriate personal protective clothing as indicated in the site-specific health and safety plan.
3. Locate sampling location(s) in accordance with project documents (e.g., work plan) and document pertinent information in the appropriate field logbook. When possible, reference locations back to existing site features such as buildings, roads, intersections, monitoring wells, etc.

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4. Verify sampling depths in as specified in the site-specific plans.
5. If decontamination of equipment and/or personnel is required, set up a decontamination zone in accordance with SOP 4-5 or other project specific procedures.
6. Prepare an area near the sampling location to perform sample collection activities.

5.2 Groundwater Sample Collection

The following steps must be followed when collecting PFAS samples for environmental purposes. Refer to SOP 1-12 for additional guidance on field sampling methods.

- Wear clean Nitrile gloves during handling of all sample containers and sampling devices.
- All clothing worn by sampling personnel must have been laundered multiple times and dried without using dryer sheets of any type. The sampler must wear nitrile gloves while filling and sealing the sample bottles.
- Acceptable materials for sampling include: stainless steel, high density polyethylene (HDPE) and polypropylene. sampling with the Watera pump and tubing with check valve is the preferred method.
- Purge the well according to SOP 4-3.
- Pre-cleaned sample bottles with closures, coolers, sample labels and a chain of custody form will be provided by the laboratory.
- Fill two pre-cleaned 500 mL HDPE bottle with the sample.
- Cap the bottles with an acceptable cap and liner closure system.
- Label the sample bottles.
- Fill out the chain of custody.
- Place in a cooler maintained at $4 \pm 2^{\circ}$ Celsius.
- Collect one equipment blank for every sample batch, not to exceed 20 samples. Collect one field duplicate for every sample batch, not to exceed 20 samples. Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, not to exceed 20 samples.
- Decontaminate sampling equipment according using PFAS Free water provided by lab and Alconox/Liquinox before proceeding to other sampling locations.
- Complete the field sampling form, being sure to record all relevant information before leaving the site. All sampling information, including well ID, sample depth, sample volume, and requisite analyses should be recorded in the field form as specified in the site-specific sampling/work plans. Field Log books shall not be used.
- Properly package all samples for shipment to laboratories and complete all necessary sample shipment documentation. Remand custody of the samples to appropriate personnel. Refer to SOPs 1-2 and 2-1 or site-specific plans.

5.3 Soil Sample Collection

- The sampler must wear nitrile gloves while conducting field work and handling sample containers
- Sampling is often conducted in areas where a vegetative turf has been established. In these cases, a clean stainless-steel spoon should be used to carefully remove the turf so that it may be replaced at the conclusion of sampling. Surface soil samples (e.g. 0 to 6 inches below surface) shall then be collected using a pre-cleaned, stainless steel spoon.
- Shallow subsurface soil samples (e.g. 6 to ~36 inches below surface) may be collected by digging a hole using a stainless-steel hand auger.
- When the desired subsurface depth is reached, a pre-cleaned hand auger shall be used to obtain the sample.
- When the soil sample is obtained, it should be deposited into a stainless-steel bowl for mixing prior to filling the sample containers. The soil should be placed directly into the bowl and mixed thoroughly by rolling the material into the middle until the material is homogenized.

5.4 Sample Shipment

- Place the samples in a cooler with ice. The samples should be shipped for next day delivery. If regular ice is used, the ice should be double bagged. Always include enough ice to keep samples around 4°C , especially during summer months. The cooler drain spout should be closed and taped so that water does not flow out of the cooler.

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- Always package samples securely to prevent breakage/spillage.
- Check with laboratory if Saturday delivery of samples is required.
- Be sure to include a completed chain of custody (COC) form in each shipment with all necessary information for both reporting and invoicing.
- Double check to make sure all samples are labeled correctly and correspond with the COC form.

6.0 Restrictions/Limitations

Acceptable materials for sampling include: stainless steel, high density polyethylene (HDPE) and polypropylene. Additional materials may be acceptable if proven not to contain PFAS. NOTE: Grundfos pumps and bladder pumps are known to contain PFC materials (e.g. Teflon™ washers for Grundfos pumps and low-density polyethylene (LDPE) bladders for bladder pumps). Selection of sampling devices must be carefully researched. All sampling equipment components and sample containers should not come in contact with aluminum foil, LDPE, glass or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer. Standard two step decontamination using detergent and clean water rinse should be considered for equipment that does come in contact with polyfluorinated materials. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with polyfluorinated materials must be avoided. Many food and drink packaging materials and “plumbers thread seal tape” contain PFAS.

All clothing worn by sampling personnel must have been laundered multiple times and dried without using dryer sheets of any type. The sampler must wear nitrile gloves while filling and sealing the sample bottles.

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Appendix B

Boring Logs

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LOG OF DP BORING NO CORE REC AND NO WELL PAINE FIELD FIRE PIT 2018.GPJ CDM BLLV.GDT 9/5/18 REV.

Boring Log FP1					
Sample ID	Depth (feet)	PID (ppm)	Sample	USCS	Symbol
					DESCRIPTION
					Topsoil: Silty SAND (SM), brown, fine to medium (mostly fine) grained sand with fine, subrounded gravel, loose, moist, numerous organics. Gravelly, silty SAND (SM), light brown, fine sand with fine to coarse, subrounded gravel, loose, dry. (Fill)
FP1-4.5	5	NA	(G)		Becomes mottled and medium dense.
				SM	
FP1-10	10	NA	(G)		Becomes brown.
FP1-16	15	NA	(G)	SM	Gravelly, silty SAND (SM), brown red, fine to medium sand with fine to coarse, subrounded gravel, medium dense, moist, occasional cinders. (Fill)
FP1-17.5		NA	(G)		Gravelly, silty SAND (SM), gray olive, poorly graded, fine to medium (mostly fine) sand with fine to coarse, subrounded gravel, medium dense to dense, moist, pockets of diamict-like texture. (Fill)
	20			SM	Becomes loose to medium dense, wet.
				SM	Gravelly, silty SAND (SM), olive brown, poorly graded, fine to medium (mostly fine) sand, with fine to coarse, subrounded gravel, medium dense to dense, moist, diamict-like texture. (Weathered Till)
	25				Boring terminated at approximately 24 feet bgs. Groundwater encountered at 19.2 feet bgs. A temporary stainless steel screen was placed 19-24 feet bgs to collect a groundwater sample.
Location: Mukilteo, WA Surface Elevation: _____ Logged By: MJ Drill Rig: DPT Equipment: Geoprobe 7800 Date Completed: 8-15-18					
				Snohomish County Paine Field Former Fire Pit Mukilteo, WA	
				Boring Log FP1 Project No: 19947-230030-TK1.FLD	
				Figure: B2 1 of 1	

LOG OF DP BORING NO CORE REC AND NO WELL PAINE FIELD FIRE PIT 2018.GPJ CDM_BLLV.GDT 9/5/18 REV.

Sample ID	Depth (feet)	PID (ppm)	Sample	USCS	Symbol	Boring Log FP2 DESCRIPTION
						Topsoil: Silty SAND (SM) Brown, poorly graded fine to medium (mostly fine) sand with trace fine, subrounded gravel, very loose, moist, numerous organics. Gravelly, silty SAND (SM), light brown, poorly graded fine sand with fine, subangular gravel, very loose, dry, mottled, (Fill)
	5			SM		As above with scattered organics. Becomes brown, loose. 2-inch lens of dark brown organic silt. 3-inch lens of dark brown organic silt with re-worked texture.
	15			SM		Gravelly, silty SAND (SM), red brown, poorly graded fine sand with fine, subangular gravel, medium dense, moist, cinders at 13.5 feet. (Fill)
	20			ML		Gravelly, sandy SILT (ML) gray olive, low-plasticity silt with fine sand and fine to coarse, subrounded gravel, medium stiff, moist, pockets of diamict-like texture. (Fill)
	25			SM		Gravelly, silty SAND (SM), gray olive, fine to medium sand with fine to coarse, subrounded to subangular gravel, medium dense, wet. (Weathered Till) Becomes gray blue at 23.5 feet. Boring terminated at 24 feet bgs. Groundwater encountered at 19.1 feet during drilling. A temporary PVC screen was placed from 19-24 feet bgs to collect a groundwater sample.
Location: Mukilteo, WA Surface Elevation: Logged By: MJ						Drill Rig: DPT Equipment: Geoprobe 7800 Date Completed: 8-15-18
						Snohomish County Paine Field Former Fire Pit Mukilteo, WA
						Boring Log FP2 Project No: 19947-230030-TK1.FLD

LOG OF DP BORING NO CORE REC AND NO WELL PAINE FIELD FIRE PIT 2018.GPJ CDM_BLLV.GDT 10/5/18 REV.

Sample ID	Depth (feet)	PID (ppm)	Sample	USCS	Symbol	Boring Log FP3 DESCRIPTION
						Topsoil: Silty SAND (SM), brown, poorly graded fine to medium (mostly fine) sand with trace fine gravel, loose, moist, numerous organics.
						Gravelly, silty SAND (SM), light brown, poorly graded, fine to medium (mostly fine) sand, with fine, subangular gravel, loose, dry. (Fill)
	5			SM		Becomes brown, moist.
	10					Becomes gray, medium dense.
	15			SM		Silty SAND (SM), red brown, poorly graded, fine to medium (mostly fine) with trace fine subrounded gravel, medium dense, moist. (Fill)
				ML		Gravelly, sandy SILT (ML), gray olive, non-plastic silt with fine sand and fine to coarse, subrounded gravel, medium stiff, moist, pockets of diamict-like texture. (Fill)
	20			SM		Very silty SAND (SM), gray olive, poorly graded, fine sand with silt, loose to medium dense, wet. (Fill)
				SM		Grades to gravelly silty SAND (SM), gray olive, poorly graded fine sand with fine to coarse subangular gravel, medium dense, moist, diamict-like texture. (Weathered Till)
	25					Boring terminated at 24 feet bgs. Groundwater encountered at 19 feet bgs. A temporary stainless steel screen was placed from 19-24 feet bgs to collect a groundwater sample.
Location: Mukilteo, WA Surface Elevation: _____ Logged By: MJ Drill Rig: DPT Equipment: Geoprobe 7800 Date Completed: 8-15-18						
					Snohomish County Paine Field Former Fire Pit Mukilteo, WA	
					Boring Log FP3 Project No: 19947-230030-TK1.FLD	
					Figure: B4 1 of 1	

LOG OF DP BORING NO CORE REC AND NO WELL PAINE FIELD FIRE PIT 2018.GPJ CDM.BLLV.GDT 9/5/18 REV.

Sample ID	Depth (feet)	PID (ppm)	Sample	USCS	Symbol	Boring Log FP4 DESCRIPTION
						Topsoil: Silty SAND (SM), brown, poorly graded fine sand with trace fine subangular gravel, moist, very loose, numerous organics. Silty, gravelly SAND (SM), light brown, poorly graded, fine sand with fine to coarse, subangular gravel, very loose, dry, trace organics, (Fill)
	5			SM		Becomes loose.
	10			SM		Silty, gravelly SAND (SM), gray olive, poorly graded, fine sand with fine to coarse, subangular gravel, medium dense, moist. (Fill)
	15			SM		Silty, gravelly SAND (SM), red brown, poorly graded, fine sand with fine to coarse, subangular gravel, medium dense, moist, black cinders at 14.5. (Fill) Red wood debris, appears to be non-dimensional, no odor. 3-inch lens of angular gravel.
	20			SM		Gravelly, silty SAND (SM), gray olive, poorly graded, fine sand with find to coarse, subrounded gravel, medium dense to dense, moist, pockets of diamict-like texture. (Fill)
	25					Refusal at 20 feet bgs. No groundwater encountered.
Location: Mukilteo, WA Surface Elevation: Logged By: MJ						Drill Rig: DPT Equipment: Geoprobe 7800 Date Completed: 8-15-18
						Snohomish County Paine Field Former Fire Pit Mukilteo, WA
						Boring Log FP4 Project No: 19947-230030-TK1.FLD

LOG OF DP BORING NO CORE REC AND NO WELL PAINE FIELD FIRE PIT 2018.GPJ CDM_BLLV.GDT 9/5/18 REV.

Sample ID	Depth (feet)	PID (ppm)	Sample	USCS	Symbol	Boring Log FP5 DESCRIPTION
				SM		Topsoil: Silty SAND (SM), brown, poorly graded, fine sand with trace fine, subrounded gravel, loose, moist. Gravelly, silty SAND (SM), light brown, poorly graded, fine sand with fine to coarse, subangular gravel, very loose, dry. (Fill)
	5			SM		Gravelly, silty SAND (SM), brown, poorly graded, fine sand with fine to coarse, subangular gravel, loose, moist, mottled. (Fill) Cinders.
	10			SM		Grades to gravelly, silty SAND (SM), gray blue, poorly graded, fine to medium (mostly fine) sand with fine to coarse, subrounded to subangular gravel, medium dense, moist, with lenses of brown silty sand, re-worked appearance. (Fill)
	15			SM		1-inch seam of organic silt.
	20			ML		Gravelly, sandy SILT (ML), gray olive, low-plasticity silt with fine to coarse, subrounded gravel, medium stiff, moist, diamict-like texture. (Weathered Till)
	25					Boring terminated at 24 feet bgs. No groundwater encountered.

Location: Mukilteo, WA
Surface Elevation: _____
Logged By: MJ

Drill Rig: DPT
Equipment: Geoprobe 7800
Date Completed: 8-15-18

Snohomish County
Paine Field Former Fire Pit
Mukilteo, WA

Boring Log FP5
Project No: 19947-230030-TK1.FLD

Figure: B6
1 of 1

LOG OF DP BORING NO CORE REC AND NO WELL PAINE FIELD FIRE PIT 2018.GPJ CDM_BLLV.GDT 9/5/18 REV.

Sample ID	Depth (feet)	PID (ppm)	Sample	USCS	Symbol	Boring Log FP6 DESCRIPTION
				SM		Topsoil: Silty SAND (SM), brown, poorly graded, fine to medium (mostly fine) sand with trace, fine, subrounded gravel, very loose, moist, numerous organics. Gravelly, silty SAND (SM), light brown, poorly graded, fine to medium (mostly fine) sand with fine to coarse, subangular to subrounded gravel, very loose, dry, mottled. (Fill) Becomes loose.
	5			SM		Gravelly, silty SAND (SM), light brown, poorly graded, fine to medium (mostly fine) sand with fine to coarse, subangular to subrounded gravel, medium dense, moist, oxide staining. (Fill) Cinders.
	15			ML		Grades to gravelly, sandy SILT (ML), gray blue, non-plastic silt with fine sand, and fine to coarse, subrounded gravel, medium stiff, moist, some oxide staining, pockets of diamict-like texture. (Fill) Becomes brown.
	25			ML		Gravelly, sandy SILT (ML), gray blue, non-plastic silt with fine sand, and fine to coarse, subrounded gravel, medium stiff, moist, diamict-like texture. (Weathered Till) Boring terminated at 24 feet bgs. Groundwater not encountered.

Location: <u>Mukilteo, WA</u> Surface Elevation: _____ Logged By: <u>MJ</u>	Drill Rig: <u>DPT</u> Equipment: <u>Geoprobe 7800</u> Date Completed: <u>8-15-18</u>

	Snohomish County Paine Field Former Fire Pit Mukilteo, WA
	Boring Log FP6 Project No: 19947-230030-TK1.FLD

Figure: B7 1 of 1

SOIL CLASSIFICATION LEGEND

MAJOR DIVISIONS			TYPICAL NAMES			SAMPLE TYPE SYMBOLS			
COARSE GRAINED SOILS More than half is larger than No. 200 sieve	GRAVELS More than half coarse fraction is larger than No. 4 sieve size	Clean gravels with little or no fines	GW		Well graded gravels, gravel-sand mixtures				Disturbed bag or jar sample
			GP		Poorly graded gravels, gravel-sand mixtures				Std. Penetration Test (2.0" OD)
		Gravel with over 12% fines	GM		Silty gravels, gravel-sand-silt mixtures				Type U Ring Sampler (3.25" OD)
			GC		Clayey gravels, gravel-sand-clay mixtures				California Sampler (3.0" OD)
	SANDS More than half coarse fraction is smaller than No. 4 sieve size	Clean sands with little or no fines	SW		Well graded sands, gravelly sands				Undisturbed Tube Sample
			SP		Poorly graded sands, gravelly sands				Grab Sample
		Sands with over 12% fines	SM		Silty sand, sand-silt mixtures				Core Run
			SC		Clayey sands, sand-clay mixtures				Non-standard Penetration Test (with split spoon sampler)
	FINE GRAINED SOILS More than half is smaller than No. 200 sieve	SILTS AND CLAYS Liquid limit less than 50	ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity				Bulk Sample
			CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays				
OL				Organic clays and organic silty clays of low plasticity					
MH				Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts					
SILTS AND CLAYS Liquid limit greater than 50		CH		Inorganic clays of high plasticity, fat clays					
		OH		Organic clays of medium to high plasticity, organic silts					
		PT		Peat and other highly organic soils					
HIGHLY ORGANIC SOILS									
DESCRIPTORS FOR SOIL STRATA AND STRUCTURE (ENGLISH/METRIC)									
General Thickness or Spacing	Parting:	less than 1/16 in. (1/6 cm)	Structure	Pocket:	Erratic, discontinuous deposit of limited extent	General Attitude	Near horizontal:	0 to 10 deg.	
	Seam:	1/16 to 1/2 in. (1/6 to 1 1/4 cm)		Lens:	Lenticular deposit		Low angle:	10 to 45 deg.	
	Layer:	1/2 to 12 in. (1 1/4 to 30 1/2 cm)		Varved:	Alternating seams of silt and clay		High angle:	45 to 80 deg.	
	Stratum:	> 12 in. (30 1/2 cm)		Laminated:	Alternating seams		Near Vertical:	80 to 90 deg.	
	Scattered:	< 1 per ft. (30 1/2 cm)		Stratified:	Alternating layers				
	Frequent:	> 1 per ft. (30 1/2 cm)							
	STRUCTURE DESCRIPTION (cont.)								
Fractured			Breaks easily along definite fractured planes			Dry - Free of moisture, dusty			
Slickensided			Polished, glossy, fractured planes			Moist - Damp but no visible free water			
Blocky, Diced			Breaks easily into small angular lumps			Wet - Visible free water			
Sheared			Disturbed texture, mix of strengths						
Homogeneous			Same color and appearance throughout						
MOISTURE DESCRIPTION									
RELATIVE DENSITY OR CONSISTENCY VS. SPT N-VALUE									
COARSE GRAINED			FINE GRAINED			MODIFIERS			
Density	N (blows/ft)	Approx. Relative Density (%)	Consistency	N (blows/ft)	Approx. Undrained Shear Str. (psf)	Trace	Particles present at levels estimated < 5%		
Very Loose	0 to 4	0 - 15	Very Soft	0 to 2	<250	Slightly (Clayey, Silty, Sandy, Gravelly)	Particles present at levels estimated at 5 to 12%		
Loose	4 to 10	15 - 35	Soft	2 to 4	250 - 500	Clayey, Silty, Sandy, Gravelly	Particles present at levels estimated at 12 to 30%		
Medium Dense	10 to 30	35 - 65	Medium Stiff	4 to 8	500 - 1000	Very (Clayey, Silty, Sandy, Gravelly)	Percentage of minor constituents estimated > 30%		
Dense	30 to 50	65 - 85	Stiff	8 to 15	1000 - 2000	PHYSICAL PROPERTY TEST			
Very Dense	Over 50	85 - 100	Very Stiff	15 to 30	2000 - 4000	AL -	Atterberg Limits		
			Hard	over 30	>4000	FC -	Fines Content		
						GSD -	Grain Size Distribution		
						MC -	Moisture Content		
						MD -	Moisture Content/Dry Density		
						SG -	Specific Gravity		
						Perm -	Permeability		
						TXP -	Triaxial Permeability		
						Cons -	Consolidation		
						Chem -	Analytical Chemical Analysis		
						Corr -	Corrosion		
						VS -	Vane Shear		
						DS -	Direct Shear		
						UC -	Unconfined Compression		
						TX -	Triaxial Compression		
						UU -	Unconsolidated, Undrained		
						CU -	Consolidated, Undrained		
						CD -	Consolidated, Drained		
Notes:									
1. Sample descriptions in this report are based on visual field and laboratory observations, which include density/consistency, moisture condition, grain size, and plasticity estimates, and should not be construed to imply field or laboratory testing unless presented herein. Visual-manual classification methods in accordance with ASTM D 2488 were used as an identification guide. Where laboratory data are available, soil classifications are in general accordance with ASTM D 2487.									
2. Dual symbols are used to indicate gravel and sand units with 5 to 12 percent fines and fine-grained units that plot in the CL-ML area of the plasticity chart.									
3. WOR = weight of rod, WOH = weight of hammer.									
Snohomish County Paine Field Former Fire Pit Mukilteo, WA									
Project No: 19947-230030-TK1.FLD Figure: B1									

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Appendix C

Laboratory Reports



2045 Mills Road West

TEL: (250) 655-5800

Sidney, BC, Canada V8L5X2

TOLL-FREE: 1-888-373-0881

SGS AXYS Client No.: 4986

Client Address: CDM Smith
14432 SE Eastgate Way # 100
Bellevue, WA, US, 98007

The SGS AXYS contact for these data is Georgina Brooks.

BATCH SUMMARY

Batch ID:	WG65265	Date:	21-Sep-2018
Analysis Type:	Perfluorinated Organic and FTS	Matrix Type:	Aqueous
BATCH MAKEUP			
Contract: 4986 Samples: L29886-1 Trip Blank L29886-2 RINSATE -1 L29886-3 RINSATE -2 L29886-4 FP3-GW L29886-5 FP2-GW L29886-6 FP1-GW		Blank: WG65265-101	
		Reference or Spike: WG65265-102	
		Duplicate:	
Comments: 1. Data are considered final. 2. For the laboratory procedural blank sample (SGS AXYS ID: WG65265-101), PFNA was detected above the reporting limit and the method criteria limit. The same compound was detected in many of the field samples at a higher concentration. Data are not blank corrected, and this should be taken into consideration during data evaluation and interpretation. 3. Blank data should be evaluated against specifications using the same blank sample size as the size of the client samples.			

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February 2017

FQA-006 Rev. 4. 20-Sep-2013

CHAIN OF CUSTODY

2045 Mills Road West TEL: (250) 655-5800 TOLL FREE 1-888-373-0881
 Sidney, British Columbia, Canada V8L 5X2 FAX: (250) 655-5811

SGS AXYS CLIENT #: 4986

REPORT TO:			INVOICE TO:			ANALYSIS REQUESTED				
Company <u>CDM SMITH</u>			Company <u>SAME</u>			<u>PFAS/PFOs</u>	<u>HOLD</u>			
Address <u>14432 SE EASTGATE WY. STE. 100</u>			Address							
<u>BELLEVUE, WA 98007</u>										
Contact <u>PAM MORRILL</u>			Contact							
Phone <u>425-519-8300</u>			Phone							
FAX			FAX							
E-mail <u>morrillpj@cdmsmith.com</u>			E-mail							
Project Name/Number:			Sampler's Name:							
Signature:										
Client Sample Identification	Matrix	Sampling Date	Sampling Time	Container Type/No.	SGS AXYS Lab Sample ID (Lab use only)					
RINSE-1	W/GC	8-15-18	0910	POLY/3	L29886-2	X				
FP3-GW	GW	↓	1345	POLY/3	-4					
RINSE-2	W/GC		1550	POLY/3	-3					
FPI-4.5	S		1625	JAR/1	L29920-1					
FPI-16	S		1630	JAR/1	-2					
FPI-17.5	S		1635	JAR/1	-3					
FPI-10	S		1710	POLY/1	-4					
FP2-GW	GW		1725	POLY/3	L29886-5	X				
FPI-GW	GW		1755	POLY/3	-6	X				
Trip Blank	GW				POLY/1	L29886-1	X			
Relinquished by (Signature) <u>Pam Morrill</u> Date <u>8/20/18</u> Time <u>1200</u>			Received by (Signature) <u>[Signature]</u> Date <u>21-Aug-2018</u> Time <u>11:45</u>			Courier		Waybill No.		
Relinquished by (Signature)			Received by (Signature)			Sample Receipt				
Date			Time							
Remarks						Cooler				
						Temp °C				
						Custody Seal #				
						Seal Intact Y / N				
						Sample Tags Y / N				

SGS AXYS METHOD MLA-110 Rev 01

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.

Trip Blank

Sample Collection:

N/A

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986

Project No.

FIRE PIT PHASE II PO# 84012

Lab Sample I.D.:

L29886-1

Matrix: AQUEOUS

Sample Size:

0.506 L

Sample Receipt Date: 21-Aug-2018

Initial Calibration Date:

30-Aug-2018

Extraction Date: 14-Sep-2018

Instrument ID:

LC MS/MS

Analysis Date: 15-Sep-2018 Time: 02:37:17

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC8W_276 S: 15

Injection Volume (uL): 3

Blank Data Filename:

FC8W_276 S: 14

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC8W_276 S: 9

Concentration Units: ng/L

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		1.62 (L)	
PFPeA	U		0.811 (L)	
PFHxA	U		0.405 (L)	
PFHpA	U		0.405 (L)	
PFOA	U		0.405 (L)	
PFNA	U		0.396 (L)	
PFDA	U		0.396 (L)	
PFUnA	U		0.396 (L)	
PFDoA	U		0.396 (L)	
PFTTrDA	U		0.396 (L)	
PFTeDA	U		0.396 (L)	
PFBS	U		0.405 (L)	
PFPeS	U		0.376 (L)	
PFHxS	U		0.405 (L)	
PFHpS	U		0.376 (L)	
PFOS	U		0.405 (L)	
PFNS	U		0.376 (L)	
PFDS	U		0.405 (L)	
PFDoS	U		0.376 (L)	
4:2 FTS	U		1.58 (L)	
6:2 FTS	U		1.42 (L)	
8:2 FTS	U		1.58 (L)	
PFOSA	U		0.405 (L)	
N-MeFOSA	U		0.455 (L)	
N-EtFOSA	U		0.989 (L)	
MeFOSAA	U		0.396 (L)	
EtFOSAA	U		0.396 (L)	
N-MeFOSE	U		4.03 (L)	
N-EtFOSE	U		3.03 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

SGS AXYS METHOD MLA-110 Rev 01

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Trip Blank
Sample Collection:
N/A

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986

Project No.

FIRE PIT PHASE II PO# 84012

Lab Sample I.D.:

L29886-1

Matrix: AQUEOUS

Sample Size:

0.506 L

Sample Receipt Date: 21-Aug-2018

Initial Calibration Date:

30-Aug-2018

Extraction Date: 14-Sep-2018

Instrument ID:

LC MS/MS

Analysis Date: 15-Sep-2018 **Time:** 02:37:17

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC8W_276 S: 15

Injection Volume (uL): 3

Blank Data Filename:

FC8W_276 S: 14

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC8W_276 S: 9

Concentration Units: ng absolute

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELLED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	37.3	93.2	2:22
13C5-PFPeA		20.0	19.4	96.9	4:25
13C5-PFHxA		10.0	9.03	90.3	4:58
13C4-PFHpA		10.0	9.40	94.0	5:37
13C8-PFOA		10.0	9.77	97.7	6:31
13C9-PFNA		5.00	4.32	86.4	7:12
13C6-PFDA		5.00	4.75	94.9	7:38
13C7-PFUnA		5.00	4.81	96.3	8:00
13C2-PFDoA		5.00	4.06	81.1	8:26
13C2-PFTeDA		5.00	3.51	70.1	9:20
13C3-PFBS		10.0	8.97	89.7	4:57
13C3-PFHxS		10.0	9.20	92.0	6:40
13C8-PFOS		10.0	9.82	98.2	7:45
13C2-4:2 FTS		20.0	23.8	119	4:49
13C2-6:2 FTS		20.0	19.0	95.1	6:11
13C2-8:2 FTS		20.0	19.1	95.4	7:28
13C8-PFOSA		10.0	9.88	98.8	8:32
D3-N-MeFOSA		10.0	9.37	93.7	9:51
D5-N-EtFOSA		10.0	10.5	105	10:06
D3-MeFOSAA		20.0	19.6	98.1	7:39
D5-EtFOSAA		20.0	18.6	92.8	7:48
d7-NMe-FOSE		100	91.9	91.9	9:43
d9-NEt-FOSE		100	88.7	88.7	9:59

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ **Jordan Berends** _____

For Axs Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Sep-2018 12:50:27; Application: XMLTransformer-1.16.50;
Report Filename: PFC_FC_LC_PFAS_L29886-1_Form2_FC8W_276S15_SJ2433608.html; Workgroup: WG65265; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.

RINSATE -1

Sample Collection:

15-Aug-2018 09:10

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986

Project No.

FIRE PIT PHASE II PO# 84012

Lab Sample I.D.:

L29886-2

Matrix: AQUEOUS

Sample Size:

0.511 L

Sample Receipt Date: 21-Aug-2018

Initial Calibration Date:

30-Aug-2018

Extraction Date: 14-Sep-2018

Instrument ID:

LC MS/MS

Analysis Date: 15-Sep-2018 Time: 02:50:45

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC8W_276 S: 16

Injection Volume (uL): 3

Blank Data Filename:

FC8W_276 S: 14

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC8W_276 S: 9

Concentration Units: ng/L

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		1.61 (L)	
PFPeA	U		0.803 (L)	
PFHxA	U		0.401 (L)	
PFHpA	U		0.401 (L)	
PFOA		0.544	0.401 (L)	6:31
PFNA	U		0.392 (L)	
PFDA	U		0.392 (L)	
PFUnA	U		0.392 (L)	
PFDoA	U		0.392 (L)	
PFTTrDA	U		0.392 (L)	
PFTeDA	U		0.392 (L)	
PFBS	U		0.401 (L)	
PFPeS	U		0.372 (L)	
PFHxS	U		0.401 (L)	
PFHpS	U		0.372 (L)	
PFOS		0.749	0.401 (L)	7:45
PFNS	U		0.372 (L)	
PFDS	U		0.401 (L)	
PFDoS	U		0.372 (L)	
4:2 FTS	U		1.57 (L)	
6:2 FTS	U		1.41 (L)	
8:2 FTS	U		1.57 (L)	
PFOSA		0.441	0.401 (L)	8:31
N-MeFOSA	U		0.450 (L)	
N-EtFOSA	U		0.979 (L)	
MeFOSAA	U		0.392 (L)	
EtFOSAA	U		0.392 (L)	
N-MeFOSE	U		3.99 (L)	
N-EtFOSE	U		3.00 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

SGS AXYS METHOD MLA-110 Rev 01

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
RINSATE -1
Sample Collection:
15-Aug-2018 09:10

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986

Project No.

FIRE PIT PHASE II PO# 84012

Lab Sample I.D.:

L29886-2

Matrix: AQUEOUS

Sample Size: 0.511 L

Sample Receipt Date: 21-Aug-2018

Initial Calibration Date: 30-Aug-2018

Extraction Date: 14-Sep-2018

Instrument ID: LC MS/MS

Analysis Date: 15-Sep-2018 **Time:** 02:50:45

Column ID: C18

Extract Volume (uL): 4000

Sample Data Filename: FC8W_276 S: 16

Injection Volume (uL): 3

Blank Data Filename: FC8W_276 S: 14

Dilution Factor: N/A

Cal. Ver. Data Filename: FC8W_276 S: 9

Concentration Units: ng absolute

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELLED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	38.0	95.1	2:22
13C5-PFPeA		20.0	20.1	100	4:24
13C5-PFHxA		10.0	9.25	92.5	4:57
13C4-PFHpA		10.0	8.86	88.6	5:36
13C8-PFOA		10.0	8.49	84.9	6:31
13C9-PFNA		5.00	4.55	90.9	7:12
13C6-PFDA		5.00	4.92	98.4	7:37
13C7-PFUnA		5.00	5.17	103	8:00
13C2-PFDoA		5.00	4.30	86.0	8:25
13C2-PFTeDA		5.00	3.38	67.5	9:20
13C3-PFBS		10.0	9.12	91.2	4:57
13C3-PFHxS		10.0	9.10	91.0	6:39
13C8-PFOS		10.0	8.91	89.1	7:44
13C2-4:2 FTS		20.0	24.4	122	4:49
13C2-6:2 FTS		20.0	20.1	101	6:11
13C2-8:2 FTS		20.0	16.3	81.7	7:28
13C8-PFOSA		10.0	8.85	88.5	8:31
D3-N-MeFOSA		10.0	7.49	74.9	9:50
D5-N-EtFOSA		10.0	8.39	83.9	10:06
D3-MeFOSAA		20.0	17.3	86.4	7:38
D5-EtFOSAA		20.0	17.2	85.9	7:47
d7-NMe-FOSE		100	77.8	77.8	9:42
d9-NEt-FOSE		100	72.6	72.6	9:59

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ **Jordan Berends** _____

For Axs Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Sep-2018 12:50:27; Application: XMLTransformer-1.16.50;
Report Filename: PFC_FC_LC_PFAS_L29886-2_Form2_FC8W_276S16_SJ2433609.html; Workgroup: WG65265; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.

RINSATE -2

Sample Collection:

15-Aug-2018 15:50

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986

Project No.

FIRE PIT PHASE II PO# 84012

Lab Sample I.D.:

L29886-3

Matrix: AQUEOUS

Sample Size:

0.510 L

Sample Receipt Date: 21-Aug-2018

Initial Calibration Date:

30-Aug-2018

Extraction Date: 14-Sep-2018

Instrument ID:

LC MS/MS

Analysis Date: 15-Sep-2018 Time: 03:04:14

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC8W_276 S: 17

Injection Volume (uL): 3

Blank Data Filename:

FC8W_276 S: 14

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC8W_276 S: 9

Concentration Units: ng/L

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		1.61 (L)	
PFPeA	U		0.804 (L)	
PFHxA	U		0.402 (L)	
PFHpA	U		0.402 (L)	
PFOA	U		0.402 (L)	
PFNA	U		0.392 (L)	
PFDA	U		0.392 (L)	
PFUnA	U		0.392 (L)	
PFDoA	U		0.392 (L)	
PFTTrDA	U		0.392 (L)	
PFTeDA	U		0.392 (L)	
PFBS	U		0.402 (L)	
PFPeS	U		0.373 (L)	
PFHxS	U		0.402 (L)	
PFHpS	U		0.373 (L)	
PFOS		0.576	0.402 (L)	7:46
PFNS	U		0.373 (L)	
PFDS	U		0.402 (L)	
PFDoS	U		0.373 (L)	
4:2 FTS	U		1.57 (L)	
6:2 FTS	U		1.41 (L)	
8:2 FTS	U		1.57 (L)	
PFOSA	U		0.402 (L)	
N-MeFOSA	U		0.451 (L)	
N-EtFOSA	U		0.981 (L)	
MeFOSAA	U		0.392 (L)	
EtFOSAA	U		0.392 (L)	
N-MeFOSE	U		4.00 (L)	
N-EtFOSE	U		3.00 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

SGS AXYS METHOD MLA-110 Rev 01

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
RINSATE -2
Sample Collection:
15-Aug-2018 15:50

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986**Project No.**

FIRE PIT PHASE II PO# 84012

Lab Sample I.D.:

L29886-3

Matrix: AQUEOUS**Sample Size:**

0.510 L

Sample Receipt Date: 21-Aug-2018**Initial Calibration Date:**

30-Aug-2018

Extraction Date: 14-Sep-2018**Instrument ID:**

LC MS/MS

Analysis Date: 15-Sep-2018 **Time:** 03:04:14**Column ID:**

C18

Extract Volume (uL): 4000**Sample Data Filename:**

FC8W_276 S: 17

Injection Volume (uL): 3**Blank Data Filename:**

FC8W_276 S: 14

Dilution Factor: N/A**Cal. Ver. Data Filename:**

FC8W_276 S: 9

Concentration Units: ng absolute

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELLED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	36.3	90.8	2:22
13C5-PFPeA		20.0	20.5	102	4:25
13C5-PFHxA		10.0	9.91	99.1	4:58
13C4-PFHpA		10.0	8.75	87.5	5:37
13C8-PFOA		10.0	8.42	84.2	6:32
13C9-PFNA		5.00	4.32	86.4	7:13
13C6-PFDA		5.00	4.99	99.9	7:38
13C7-PFUnA		5.00	4.81	96.3	8:01
13C2-PFDoA		5.00	4.30	86.0	8:26
13C2-PFTeDA		5.00	3.78	75.5	9:21
13C3-PFBS		10.0	8.83	88.3	4:57
13C3-PFHxS		10.0	8.58	85.8	6:41
13C8-PFOS		10.0	8.67	86.7	7:46
13C2-4:2 FTS		20.0	21.3	107	4:49
13C2-6:2 FTS		20.0	19.7	98.7	6:12
13C2-8:2 FTS		20.0	17.3	86.4	7:29
13C8-PFOSA		10.0	8.88	88.8	8:32
D3-N-MeFOSA		10.0	7.33	73.3	9:51
D5-N-EtFOSA		10.0	8.21	82.1	10:06
D3-MeFOSAA		20.0	19.0	95.1	7:40
D5-EtFOSAA		20.0	17.4	86.9	7:48
d7-NMe-FOSE		100	72.2	72.2	9:43
d9-NET-FOSE		100	71.5	71.5	9:59

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

For Axs Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Sep-2018 12:50:27; Application: XMLTransformer-1.16.50;
Report Filename: PFC_FC_LC_PFAS_L29886-3_Form2_FC8W_276S17_SJ2433610.html; Workgroup: WG65265; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.

FP3-GW

Sample Collection:

15-Aug-2018 13:45

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986

Project No.

FIRE PIT PHASE II PO# 84012

Lab Sample I.D.:

L29886-4 N

Matrix: AQUEOUS

Sample Size:

0.508 L

Sample Receipt Date: 21-Aug-2018

Initial Calibration Date:

30-Aug-2018

Extraction Date: 14-Sep-2018

Instrument ID:

LC MS/MS

Analysis Date: 15-Sep-2018 Time: 03:17:42

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC8W_276 S: 18

Injection Volume (uL): 3

Blank Data Filename:

FC8W_276 S: 14

Dilution Factor: 5

Cal. Ver. Data Filename:

FC8W_276 S: 9

Concentration Units: ng/L

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	D	51.8	8.07 (L)	2:21
PFPeA	D	185	4.03 (L)	4:25
PFHxA	D	215	2.02 (L)	4:58
PFHpA	D	73.9	2.02 (L)	5:37
PFOA	D	115	2.02 (L)	6:31
PFNA	D	108	1.97 (L)	7:13
PFDA	D	2.95	1.97 (L)	7:38
PFUnA	D	15.8	1.97 (L)	8:00
PFDaA	U D		1.97 (L)	
PFTTrDA	U D		1.97 (L)	
PFTeDA	U D		1.97 (L)	
PFBS	D	363	2.02 (L)	4:57
PFPeS	D	508	1.87 (L)	5:41
PFHxS	D	2250	2.02 (L)	6:40
PFHpS	D	77.8	4.10 (S)	7:20
PFOS	D	1310	2.02 (L)	7:45
PFNS	U D		1.87 (L)	
PFDS	U D		2.02 (L)	
PFDoS	U D		1.87 (L)	
4:2 FTS	U D		7.87 (L)	
6:2 FTS	D	181	7.08 (L)	6:11
8:2 FTS	U D		7.87 (L)	
PFOSA	D	13.4	2.02 (L)	8:32
N-MeFOSA	U D		2.26 (L)	
N-EtFOSA	U D		4.92 (L)	
MeFOSAA	U D		1.97 (L)	
EtFOSAA	U D		1.97 (L)	
N-MeFOSE	U D		20.1 (L)	
N-EtFOSE	U D		15.0 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; D = dilution data.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

SGS AXYS METHOD MLA-110 Rev 01

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
FP3-GW
Sample Collection:
15-Aug-2018 13:45

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986

Project No.

FIRE PIT PHASE II PO# 84012

Lab Sample I.D.:

L29886-4 N

Matrix: AQUEOUS

Sample Size:

0.508 L

Sample Receipt Date: 21-Aug-2018

Initial Calibration Date:

30-Aug-2018

Extraction Date: 14-Sep-2018

Instrument ID:

LC MS/MS

Analysis Date: 15-Sep-2018 **Time:** 03:17:42

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC8W_276 S: 18

Injection Volume (uL): 3

Blank Data Filename:

FC8W_276 S: 14

Dilution Factor: 5

Cal. Ver. Data Filename:

FC8W_276 S: 9

Concentration Units: ng absolute

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELLED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA	D	40.0	35.9	89.8	2:21
13C5-PFPeA	D	20.0	19.0	94.8	4:25
13C5-PFHxA	D	10.0	8.96	89.6	4:58
13C4-PFHpA	D	10.0	9.02	90.2	5:36
13C8-PFOA	D	10.0	9.24	92.4	6:31
13C9-PFNA	D	5.00	4.17	83.4	7:12
13C6-PFDA	D	5.00	4.29	85.9	7:38
13C7-PFUnA	D	5.00	4.06	81.2	8:00
13C2-PFDoA	D	5.00	3.49	69.8	8:26
13C2-PFTeDA	D	5.00	3.25	65.0	9:21
13C3-PFBS	D	10.0	8.56	85.6	4:57
13C3-PFHxS	D	10.0	8.42	84.2	6:40
13C8-PFOS	D	10.0	9.09	90.9	7:45
13C2-4:2 FTS	D	20.0	21.0	105	4:49
13C2-6:2 FTS	D	20.0	20.0	100	6:11
13C2-8:2 FTS	D	20.0	14.0	70.0	7:28
13C8-PFOSA	D	10.0	7.91	79.1	8:32
D3-N-MeFOSA	D	10.0	6.81	68.1	9:51
D5-N-EtFOSA	D	10.0	8.32	83.2	10:06
D3-MeFOSAA	D	20.0	15.3	76.3	7:39
D5-EtFOSAA	D	20.0	15.5	77.3	7:48
d7-NMe-FOSE	D	100	73.8	73.8	9:43
d9-NEt-FOSE	D	100	69.0	69.0	9:59

(1) Where applicable, custom lab flags have been used on this report; D = dilution data.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ **Jordan Berends** _____

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 Report Filename: PFC_FC_LC_PFAS_L29886-4_Form2_FC8W_276S18_SJ2433611.html; Workgroup: WG65265; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.

FP2-GW

Sample Collection:

15-Aug-2018 17:25

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986

Project No.

FIRE PIT PHASE II PO# 84012

Lab Sample I.D.:

L29886-5

Matrix: AQUEOUS

Sample Size:

0.0617 L

Sample Receipt Date: 21-Aug-2018

Initial Calibration Date:

30-Aug-2018

Extraction Date: 14-Sep-2018

Instrument ID:

LC MS/MS

Analysis Date: 15-Sep-2018 Time: 03:31:10

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC8W_276 S: 19

Injection Volume (uL): 3

Blank Data Filename:

FC8W_276 S: 14

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC8W_276 S: 9

Concentration Units: ng/L

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA		99.8	13.3 (L)	2:23
PFPeA		371	6.65 (L)	4:25
PFHxA		514	3.33 (L)	4:58
PFHpA		144	3.33 (L)	5:37
PFOA		508	3.33 (L)	6:32
PFNA		250	3.24 (L)	7:13
PFDA	U		3.24 (L)	
PFUnA		19.8	3.24 (L)	8:00
PFDoA	U		3.24 (L)	
PFTTrDA		4.12	3.24 (L)	8:53
PFTeDA	U		3.24 (L)	
PFBS		758	3.33 (L)	4:58
PFPeS		933	3.08 (L)	5:42
PFHxS		5430	3.33 (L)	6:41
PFHpS		563	3.08 (L)	7:20
PFOS		4970	3.33 (L)	7:45
PFNS	U		3.08 (L)	
PFDS	U		3.33 (L)	
PFDoS	U		3.08 (L)	
4:2 FTS	U		13.0 (L)	
6:2 FTS		205	11.7 (L)	6:12
8:2 FTS	U		13.0 (L)	
PFOSA		4.76	3.33 (L)	8:33
N-MeFOSA	U		3.73 (L)	
N-EtFOSA	U		8.11 (L)	
MeFOSAA	U		3.24 (L)	
EtFOSAA	U		3.24 (L)	
N-MeFOSE	U		33.1 (L)	
N-EtFOSE	U		24.8 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

SGS AXYS METHOD MLA-110 Rev 01

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
FP2-GW
Sample Collection:
15-Aug-2018 17:25

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986**Project No.**

FIRE PIT PHASE II PO# 84012

Lab Sample I.D.:

L29886-5

Matrix: AQUEOUS**Sample Size:** 0.0617 L**Sample Receipt Date:** 21-Aug-2018**Initial Calibration Date:** 30-Aug-2018**Extraction Date:** 14-Sep-2018**Instrument ID:** LC MS/MS**Analysis Date:** 15-Sep-2018 **Time:** 03:31:10**Column ID:** C18**Extract Volume (uL):** 4000**Sample Data Filename:** FC8W_276 S: 19**Injection Volume (uL):** 3**Blank Data Filename:** FC8W_276 S: 14**Dilution Factor:** N/A**Cal. Ver. Data Filename:** FC8W_276 S: 9**Concentration Units:** ng absolute

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELLED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	32.0	80.0	2:22
13C5-PFPeA		20.0	16.9	84.5	4:25
13C5-PFHxA		10.0	7.85	78.5	4:58
13C4-PFHpA		10.0	7.84	78.4	5:37
13C8-PFOA		10.0	7.99	79.9	6:32
13C9-PFNA		5.00	3.61	72.3	7:13
13C6-PFDA		5.00	3.75	74.9	7:38
13C7-PFUnA		5.00	3.51	70.1	8:00
13C2-PFDoA		5.00	3.03	60.6	8:26
13C2-PFTeDA		5.00	2.89	57.7	9:20
13C3-PFBS		10.0	7.43	74.3	4:58
13C3-PFHxS		10.0	7.18	71.8	6:41
13C8-PFOS		10.0	6.75	67.5	7:45
13C2-4:2 FTS		20.0	20.4	102	4:50
13C2-6:2 FTS		20.0	16.3	81.5	6:12
13C2-8:2 FTS		20.0	13.7	68.5	7:29
13C8-PFOSA		10.0	6.92	69.2	8:33
D3-N-MeFOSA		10.0	5.72	57.2	9:51
D5-N-EtFOSA		10.0	6.52	65.2	10:06
D3-MeFOSAA		20.0	13.1	65.5	7:39
D5-EtFOSAA		20.0	13.0	64.9	7:48
d7-NMe-FOSE		100	59.2	59.2	9:43
d9-NEt-FOSE		100	56.1	56.1	9:59

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

For Axs Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Sep-2018 12:50:27; Application: XMLTransformer-1.16.50;
Report Filename: PFC_FC_LC_PFAS_L29886-5_Form2_FC8W_276S19_SJ2433612.html; Workgroup: WG65265; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.

FP1-GW

Sample Collection:

15-Aug-2018 17:55

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986

Project No.

FIRE PIT PHASE II PO# 84012

Lab Sample I.D.:

L29886-6 N

Matrix: AQUEOUS

Sample Size:

0.0602 L

Sample Receipt Date: 21-Aug-2018

Initial Calibration Date:

30-Aug-2018

Extraction Date: 14-Sep-2018

Instrument ID:

LC MS/MS

Analysis Date: 15-Sep-2018 Time: 03:44:38

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC8W_276 S: 20

Injection Volume (uL): 3

Blank Data Filename:

FC8W_276 S: 14

Dilution Factor: 5

Cal. Ver. Data Filename:

FC8W_276 S: 9

Concentration Units: ng/L

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U D		138 (L)	
PFPeA	D	292	69.0 (L)	4:25
PFHxA	D	506	34.5 (L)	4:58
PFHpA	D	107	34.5 (L)	5:36
PFOA	D	348	34.5 (L)	6:31
PFNA	D	1900	33.7 (L)	7:12
PFDA	U D		33.7 (L)	
PFUnA	U D		33.7 (L)	
PFDoA	U D		33.7 (L)	
PFTTrDA	U D		33.7 (L)	
PFTeDA	U D		33.7 (L)	
PFBS	D	523	34.5 (L)	4:57
PFPeS	D	943	32.0 (L)	5:41
PFHxS	D	5680	34.5 (L)	6:39
PFHpS	D	304	32.0 (L)	7:20
PFOS	D	33300	34.5 (L)	7:45
PFNS	U D		32.0 (L)	
PFDS	U D		34.5 (L)	
PFDoS	U D		32.0 (L)	
4:2 FTS	U D		135 (L)	
6:2 FTS	D	131	121 (L)	6:11
8:2 FTS	U D		135 (L)	
PFOSA	U D		34.5 (L)	
N-MeFOSA	U D		38.7 (L)	
N-EtFOSA	U D		84.2 (L)	
MeFOSAA	U D		33.7 (L)	
EtFOSAA	U D		33.7 (L)	
N-MeFOSE	U D		344 (L)	
N-EtFOSE	U D		258 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; D = dilution data.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

SGS AXYS METHOD MLA-110 Rev 01

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
FP1-GW
Sample Collection:
15-Aug-2018 17:55

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986

Project No.

FIRE PIT PHASE II PO# 84012

Lab Sample I.D.:

L29886-6 N

Matrix: AQUEOUS

Sample Size: 0.0602 L

Sample Receipt Date: 21-Aug-2018

Initial Calibration Date: 30-Aug-2018

Extraction Date: 14-Sep-2018

Instrument ID: LC MS/MS

Analysis Date: 15-Sep-2018 **Time:** 03:44:38

Column ID: C18

Extract Volume (uL): 4000

Sample Data Filename: FC8W_276 S: 20

Injection Volume (uL): 3

Blank Data Filename: FC8W_276 S: 14

Dilution Factor: 5

Cal. Ver. Data Filename: FC8W_276 S: 9

Concentration Units: ng absolute

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELLED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA	D	40.0	37.5	93.7	2:21
13C5-PFPeA	D	20.0	18.7	93.5	4:25
13C5-PFHxA	D	10.0	8.39	83.9	4:57
13C4-PFHpA	D	10.0	9.58	95.8	5:36
13C8-PFOA	D	10.0	8.77	87.7	6:31
13C9-PFNA	D	5.00	4.39	87.8	7:12
13C6-PFDA	D	5.00	4.23	84.6	7:37
13C7-PFUnA	D	5.00	3.63	72.6	8:00
13C2-PFDoA	D	5.00	3.07	61.5	8:25
13C2-PFTeDA	D	5.00	3.15	63.1	9:20
13C3-PFBS	D	10.0	12.3	123	4:57
13C3-PFHxS	D	10.0	10.9	109	6:39
13C8-PFOS	D	10.0	7.48	74.8	7:45
13C2-4:2 FTS	D	20.0	25.8	129	4:49
13C2-6:2 FTS	D	20.0	25.7	128	6:11
13C2-8:2 FTS	D	20.0	19.8	99.1	7:28
13C8-PFOSA	D	10.0	8.84	88.4	8:32
D3-N-MeFOSA	D	10.0	8.44	84.4	9:50
D5-N-EtFOSA	D	10.0	9.57	95.7	10:06
D3-MeFOSAA	D	20.0	14.8	74.2	7:39
D5-EtFOSAA	D	20.0	17.8	89.2	7:47
d7-NMe-FOSE	D	100	82.8	82.8	9:42
d9-NEt-FOSE	D	100	78.3	78.3	9:59

(1) Where applicable, custom lab flags have been used on this report; D = dilution data.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ **Jordan Berends** _____

For Axs Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Sep-2018 12:50:27; Application: XMLTransformer-1.16.50;
 Report Filename: PFC_FC_LC_PFAS_L29886-6_Form2_FC8W_276S20_SJ2433613.html; Workgroup: WG65265; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.

Lab Blank

Sample Collection:

N/A

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986

Project No.

N/A

Lab Sample I.D.:

WG65265-101

Matrix: AQUEOUS

Sample Size:

0.500 L

Sample Receipt Date: N/A

Initial Calibration Date:

30-Aug-2018

Extraction Date: 14-Sep-2018

Instrument ID:

LC MS/MS

Analysis Date: 15-Sep-2018 Time: 02:23:49

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC8W_276 S: 14

Injection Volume (uL): 3

Blank Data Filename:

FC8W_276 S: 14

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC8W_276 S: 9

Concentration Units: ng/L

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		1.64 (L)	
PFPeA	U		0.820 (L)	
PFHxA	U		0.410 (L)	
PFHpA	U		0.410 (L)	
PFOA	U		0.410 (L)	
PFNA		0.432	0.400 (L)	7:14
PFDA	U		0.400 (L)	
PFUnA	U		0.400 (L)	
PFDoA	U		0.400 (L)	
PFTTrDA	U		0.400 (L)	
PFTeDA	U		0.400 (L)	
PFBS	U		0.410 (L)	
PFPeS	U		0.380 (L)	
PFHxS	U		0.410 (L)	
PFHpS	U		0.380 (L)	
PFOS	U		0.410 (L)	
PFNS	U		0.380 (L)	
PFDS	U		0.410 (L)	
PFDoS	U		0.380 (L)	
4:2 FTS	U		1.60 (L)	
6:2 FTS	U		1.44 (L)	
8:2 FTS	U		1.60 (L)	
PFOSA	U		0.410 (L)	
N-MeFOSA	U		0.460 (L)	
N-EtFOSA	U		1.00 (L)	
MeFOSAA	U		0.400 (L)	
EtFOSAA	U		0.400 (L)	
N-MeFOSE	U		4.08 (L)	
N-EtFOSE	U		3.06 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

SGS AXYS METHOD MLA-110 Rev 01

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Lab Blank
Sample Collection:
N/A

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986**Project No.**

N/A

Lab Sample I.D.:

WG65265-101

Matrix: AQUEOUS**Sample Size:**

0.500 L

Sample Receipt Date: N/A**Initial Calibration Date:**

30-Aug-2018

Extraction Date: 14-Sep-2018**Instrument ID:**

LC MS/MS

Analysis Date: 15-Sep-2018 **Time:** 02:23:49**Column ID:**

C18

Extract Volume (uL): 4000**Sample Data Filename:**

FC8W_276 S: 14

Injection Volume (uL): 3**Blank Data Filename:**

FC8W_276 S: 14

Dilution Factor: N/A**Cal. Ver. Data Filename:**

FC8W_276 S: 9

Concentration Units: ng absolute

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELLED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	37.3	93.1	2:22
13C5-PFPeA		20.0	20.2	101	4:25
13C5-PFHxA		10.0	9.87	98.7	4:58
13C4-PFHpA		10.0	9.73	97.3	5:37
13C8-PFOA		10.0	9.25	92.5	6:32
13C9-PFNA		5.00	4.62	92.3	7:13
13C6-PFDA		5.00	4.80	96.0	7:38
13C7-PFUnA		5.00	4.59	91.8	8:01
13C2-PFDoA		5.00	4.05	80.9	8:26
13C2-PFTeDA		5.00	3.60	71.9	9:21
13C3-PFBS		10.0	8.87	88.7	4:58
13C3-PFHxS		10.0	8.83	88.3	6:41
13C8-PFOS		10.0	8.94	89.4	7:46
13C2-4:2 FTS		20.0	24.8	124	4:50
13C2-6:2 FTS		20.0	20.0	100	6:12
13C2-8:2 FTS		20.0	17.7	88.4	7:29
13C8-PFOSA		10.0	8.54	85.4	8:33
D3-N-MeFOSA		10.0	7.89	78.9	9:51
D5-N-EtFOSA		10.0	8.57	85.7	10:06
D3-MeFOSAA		20.0	17.7	88.6	7:40
D5-EtFOSAA		20.0	17.6	88.0	7:49
d7-NMe-FOSE		100	80.9	80.9	9:43
d9-NEt-FOSE		100	79.1	79.1	9:59

(1) Where applicable, custom lab flags have been used on this report.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

For Axs Internal Use Only [XSL Template: FC-Form2.xsl; Created: 21-Sep-2018 12:50:27; Application: XMLTransformer-1.16.50;
Report Filename: PFC_FC_LC_PFAS_WG65265-101_Form2_FC8W_276S14_SJ2433606.html; Workgroup: WG65265; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 8A

PERFLUORINATED ORGANICS ONGOING PRECISION AND RECOVERY (OPR)

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4986	Lab Sample I.D.:	WG65265-102
Matrix:	AQUEOUS	Initial Calibration Date:	30-Aug-2018
Extraction Date:	14-Sep-2018	Instrument ID:	LC MS/MS
Analysis Date:	15-Sep-2018 Time: 01:56:53	Column ID:	C18
Extract Volume (uL):	4000	OPR Data Filename:	FC8W_276 S: 12
Injection Volume (uL):	3	Blank Data Filename:	FC8W_276 S: 14
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC8W_276 S: 9

ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT, BASED ON A 1 mL EXTRACT VOLUME.

COMPOUND	LAB FLAG ¹	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	% RECOVERY	RETENTION TIME
PFBA		39.7	41.7	105	2:23
PFPeA		19.9	20.3	102	4:25
PFHxA		9.94	10.2	103	4:58
PFHpA		9.95	9.90	99.4	5:37
PFOA		9.95	10.9	109	6:33
PFNA		9.98	10.3	103	7:13
PFDA		9.94	10.2	103	7:38
PFUnA		9.97	8.46	84.8	8:01
PFDoA		10.0	11.6	115	8:26
PFTTrDA		10.1	11.8	117	8:54
PFTeDA		9.95	10.1	102	9:21
PFBS		9.86	10.5	106	4:58
PFPeS		9.38	9.40	100	5:42
PFHxS		9.98	10.4	105	6:41
PFHpS		9.52	9.69	102	7:21
PFOS		9.92	9.58	96.6	7:46
PFNS		9.60	9.33	97.2	8:10
PFDS		9.90	9.69	97.9	8:37
PFDoS		9.68	8.04	83.1	9:32
4:2 FTS		40.1	42.5	106	4:50
6:2 FTS		36.1	39.2	109	6:12
8:2 FTS		40.0	43.3	108	7:29
PFOSA		9.93	10.4	105	8:32
N-MeFOSA		11.5	11.9	104	9:51
N-EtFOSA		25.0	24.0	96.1	10:06
MeFOSAA		10.0	10.5	105	7:40
EtFOSAA		10.0	9.18	91.8	7:49
N-MeFOSE		99.0	105	106	9:45
N-EtFOSE		74.2	76.9	104	10:00

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

SGS AXYS METHOD MLA-110 Rev 01

Form 8B

PERFLUORINATED ORGANICS ONGOING PRECISION AND RECOVERY (OPR)

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4986	Lab Sample I.D.:	WG65265-102
Matrix:	AQUEOUS	Initial Calibration Date:	30-Aug-2018
Extraction Date:	14-Sep-2018	Instrument ID:	LC MS/MS
Analysis Date:	15-Sep-2018 Time: 01:56:53	Column ID:	C18
Extract Volume (uL):	4000	OPR Data Filename:	FC8W_276 S: 12
Injection Volume (uL):	3	Blank Data Filename:	FC8W_276 S: 14
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC8W_276 S: 9

ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT, BASED ON A 1 mL EXTRACT VOLUME.

LABELLED COMPOUND	LAB FLAG ¹	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	% RECOVERY	RETENTION TIME
13C4-PFBA		40.0	36.4	91.0	2:22
13C5-PFPeA		20.0	19.5	97.7	4:25
13C5-PFHxA		10.0	9.67	96.7	4:58
13C4-PFHpA		10.0	9.33	93.3	5:37
13C8-PFOA		10.0	9.00	90.0	6:32
13C9-PFNA		5.00	4.32	86.3	7:13
13C6-PFDA		5.00	5.01	100	7:38
13C7-PFUnA		5.00	4.66	93.3	8:01
13C2-PFDoA		5.00	4.19	83.9	8:26
13C2-PFTeDA		5.00	3.90	78.1	9:21
13C3-PFBS		10.0	8.81	88.1	4:58
13C3-PFHxS		10.0	9.00	90.0	6:41
13C8-PFOS		10.0	8.96	89.6	7:46
13C2-4:2 FTS		20.0	22.7	113	4:50
13C2-6:2 FTS		20.0	18.3	91.3	6:12
13C2-8:2 FTS		20.0	17.2	86.1	7:29
13C8-PFOSA		10.0	8.36	83.6	8:33
D3-N-MeFOSA		10.0	7.60	76.0	9:51
D5-N-EtFOSA		10.0	9.00	90.0	10:06
D3-MeFOSAA		20.0	17.4	87.1	7:40
D5-EtFOSAA		20.0	18.2	90.8	7:48
d7-NMe-FOSE		100	77.9	77.9	9:43
d9-NEt-FOSE		100	76.3	76.3	9:59

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: Jordan Berends

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

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Report Filename: PFC_FC_LC_PFAS_WG65265-102_Form8B_SJ2433603.html; Workgroup: WG65265; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 3A
LC MS/MS INITIAL CALIBRATION PERCENT RECOVERIES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Initial Calibration Date: 30-Aug-2018

CS0 Data Filename: N/A
CS1 Data Filename: FC8W_251 S: 14
CS2 Data Filename: FC8W_251 S: 15
CS3 Data Filename: FC8W_251 S: 16
CS4 Data Filename: FC8W_251 S: 17
CS5 Data Filename: FC8W_251 S: 18
CS6 Data Filename: FC8W_251 S: 19
CS7 Data Filename: FC8W_251 S: 20
CS8 Data Filename: FC8W_251 S: 21

Instrument ID: LC MS/MS

LC Column ID: C18

COMPOUND	LAB FLAG ¹	PERCENT RECOVERY (%)								
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8
PFBA			98.8	100	97.3	102	101	101	99.2	100
PFPeA			95.0	97.0	96.7	103	107	102	100	99.7
PFHxA			83.8	99.7	99.9	110	110	97.2	100	100
PFHpA			98.2	101	95.9	103	99.8	102	102	99.5
PFOA			90.0	108	103	104	94.2	104	97.6	100
PFNA			94.9	101	99.9	102	104	100	98.5	100
PFDA			89.5	90.8	99.8	104	109	104	104	98.7
PFUnA			96.5	117	109	99.2	86.5	97.3	93.3	102
PFDoA			93.7	97.1	99.1	106	101	104	99.2	
PFTTrDA			89.4	101	98.5	103	107	103	99.2	
PFTeDA			82.4	107	93.5	108	109	101	99.5	
PFBS			82.6	99.9	113	108	99.4	99.7	96.6	101
PFPeS			97.0	106	98.9	92.1	103	104	99.2	
PFHxS			80.7	97.5	102	102	114	104	99.3	99.9
PFHpS			87.2	107	92.5	104	100	108	102	99.1
PFOS			83.2	113	105	105	98.7	97.6	96.8	101
PFNS			101	108	95.3	90.5	103	101	102	99.5
PFDS			102	99.9	105	89.9	105	97.9	99.3	100
PFDoS			87.1	100	111	97.6	104	99.3	101	99.7
4:2 FTS			88.1	95.1	104	93.7	110	112	97.2	
6:2 FTS			83.5	109	107	101	98.6	100		
8:2 FTS			90.8	111	99.5	96.9	102	99.7		
PFOSA			84.2	88.1	113	111	102	100	102	99.4
N-MeFOSA			92.4	85.0	106	113	99.2	106	98.8	
N-EtFOSA			80.6	111	107	108	95.2	101	97.2	101
MeFOSAA			80.1	109	87.7	127	102	98.8	94.1	101
EtFOSAA			90.6	124	98.9	97.3	92.8	103	91.5	102
N-MeFOSE			97.0	95.6	103	103	101	100	99.6	100
N-EtFOSE			92.9	98.3	103	101	102	104	99.1	100

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Kristina Coleman _____

SGS AXYS METHOD MLA-110 Rev 01

Form 3B

LC MS/MS INITIAL CALIBRATION PERCENT RECOVERIES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 30-Aug-2018

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A

CS1 Data Filename: FC8W_251 S: 14

CS2 Data Filename: FC8W_251 S: 15

CS3 Data Filename: FC8W_251 S: 16

CS4 Data Filename: FC8W_251 S: 17

CS5 Data Filename: FC8W_251 S: 18

CS6 Data Filename: FC8W_251 S: 19

CS7 Data Filename: FC8W_251 S: 20

CS8 Data Filename: FC8W_251 S: 21

LABELED COMPOUND	LAB FLAG ¹	PERCENT RECOVERIES (%)								
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8
13C4-PFBA			102	98.9	101	100	101	98.9	100	97.2
13C5-PFPeA			103	104	108	103	103	97.8	100	81.9
13C5-PFHxA			101	103	106	101	103	102	99.6	83.2
13C4-PFHpA			99.4	103	103	104	103	101	96.1	91.0
13C8-PFOA			102	103	103	103	105	98.5	99.4	85.7
13C9-PFNA			105	103	103	98.1	95.3	98.7	98.1	99.1
13C6-PFDA			119	108	118	101	106	102	89.2	57.0
13C7-PFUnA			113	106	119	97.3	105	103	96.8	60.0
13C2-PFDoA			115	106	114	93.5	112	96.8	93.0	68.8
13C2-PFTeDA			114	97.2	116	96.0	113	98.1	91.9	73.5
13C3-PFBS			107	98.8	104	101	113	111	93.9	70.9
13C3-PFHxS			102	101	107	100	102	101	94.0	92.4
13C8-PFOS			105	98.1	97.4	96.8	101	100	95.3	106
13C2-4:2 FTS			119	111	120	112	113	100	70.1	54.7
13C2-6:2 FTS			108	101	111	104	117	102	85.5	72.3
13C2-8:2 FTS			111	110	115	106	111	97.4	73.1	77.8
13C8-PFOSA			98.8	99.2	92.5	92.4	100	99.5	97.3	120
D3-N-MeFOSA			92.6	98.6	88.7	88.7	97.8	96.0	98.4	139
D5-N-EtFOSA			93.9	101	94.2	95.2	104	97.5	96.2	118
D3-MeFOSAA			92.3	104	101	97.0	103	111	100	91.6
D5-EtFOSAA			104	100	106	99.7	104	98.8	93.4	93.8
d7-NMe-FOSE			102	99.9	97.1	93.5	105	97.5	93.9	111
d9-NEt-FOSE			101	100	95.9	93.2	106	94.9	95.9	113

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Kristina Coleman _____

For Axy Internal Use Only [XSL Template: FC-Form3B.xsl; Created: 21-Sep-2018 12:50:27; Application: XMLTransformer-1.16.50;
Report Filename: PFOA_FC_LC_30-Aug-2018_FC8W__Form3B_GS77716.html; Workgroup: WG65265; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 3C
LC MS/MS INITIAL CALIBRATION RETENTION TIMES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 30-Aug-2018

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A

CS1 Data Filename: FC8W_251 S: 14

CS2 Data Filename: FC8W_251 S: 15

CS3 Data Filename: FC8W_251 S: 16

CS4 Data Filename: FC8W_251 S: 17

CS5 Data Filename: FC8W_251 S: 18

CS6 Data Filename: FC8W_251 S: 19

CS7 Data Filename: FC8W_251 S: 20

CS8 Data Filename: FC8W_251 S: 21

COMPOUND	LAB FLAG ¹	RETENTION TIMES								MEAN RT
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8
PFBA			2:25	2:24	2:25	2:24	2:25	2:25	2:24	2:24
PFPeA			4:27	4:27	4:27	4:27	4:27	4:27	4:27	4:27
PFHxA			5:00	5:00	5:00	5:00	5:00	5:00	5:00	5:00
PFHpA			5:39	5:39	5:39	5:39	5:39	5:39	5:39	5:39
PFOA			6:35	6:35	6:35	6:35	6:35	6:35	6:35	6:35
PFNA			7:14	7:15	7:15	7:15	7:15	7:15	7:14	7:15
PFDA			7:38	7:39	7:39	7:39	7:39	7:39	7:39	7:39
PFUnA			8:00	8:01	8:01	8:01	8:01	8:01	8:00	8:01
PFDoA			8:26	8:26	8:26	8:26	8:26	8:26	8:26	8:26
PFTTrDA			8:55	8:54	8:54	8:54	8:54	8:55	8:54	8:54
PFTeDA			9:22	9:22	9:22	9:22	9:22	9:22	9:22	9:22
PFBS			4:59	5:00	4:59	4:59	4:59	4:59	4:59	4:59
PFPeS			5:44	5:44	5:44	5:45	5:44	5:44	5:44	5:44
PFHxS			6:44	6:44	6:44	6:44	6:44	6:44	6:44	6:44
PFHpS			7:22	7:22	7:22	7:22	7:22	7:22	7:22	7:22
PFOS			7:46	7:46	7:46	7:46	7:46	7:46	7:46	7:46
PFNS			8:10	8:10	8:11	8:10	8:10	8:11	8:10	8:10
PFDS			8:38	8:38	8:38	8:38	8:38	8:38	8:38	8:38
PFDoS			9:33	9:33	9:32	9:32	9:32	9:33	9:32	9:32
4:2 FTS			4:50	4:51	4:51	4:51	4:51	4:51	4:51	4:51
6:2 FTS			6:14	6:15	6:15	6:14	6:14	6:14		6:14
8:2 FTS			7:29	7:29	7:29	7:30	7:30	7:29		7:29
PFOSA			8:32	8:32	8:32	8:32	8:32	8:32	8:32	8:32
N-MeFOSA			9:51	9:50	9:50	9:50	9:50	9:51	9:50	9:50
N-EtFOSA			10:10	10:09	10:09	10:09	10:09	10:10	10:09	10:09
MeFOSAA			7:40	7:40	7:40	7:41	7:40	7:40	7:40	7:40
EtFOSAA			7:48	7:49	7:49	7:49	7:49	7:49	7:48	7:49
N-MeFOSE			9:43	9:42	9:42	9:43	9:43	9:43	9:42	9:43
N-EtFOSE			10:02	10:02	10:02	10:02	10:02	10:02	10:01	10:02

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: Kristina Coleman

SGS AXYS METHOD MLA-110 Rev 01

Form 3D
LC MS/MS INITIAL CALIBRATION RETENTION TIMES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 30-Aug-2018

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A

CS1 Data Filename: FC8W_251 S: 14

CS2 Data Filename: FC8W_251 S: 15

CS3 Data Filename: FC8W_251 S: 16

CS4 Data Filename: FC8W_251 S: 17

CS5 Data Filename: FC8W_251 S: 18

CS6 Data Filename: FC8W_251 S: 19

CS7 Data Filename: FC8W_251 S: 20

CS8 Data Filename: FC8W_251 S: 21

LABELED COMPOUND	LAB FLAG ¹	RETENTION TIMES								MEAN RT	
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7		CS8
13C4-PFBA			2:24	2:24	2:24	2:24	2:24	2:24	2:24	2:24	2:24
13C5-PFPeA			4:27	4:27	4:27	4:27	4:27	4:27	4:27	4:27	4:27
13C5-PFHxA			4:59	5:00	5:00	5:00	5:00	4:59	4:59	5:00	5:00
13C4-PFHpA			5:39	5:39	5:39	5:39	5:39	5:39	5:39	5:39	5:39
13C8-PFOA			6:35	6:35	6:35	6:35	6:35	6:35	6:35	6:35	6:35
13C9-PFNA			7:14	7:15	7:14	7:15	7:15	7:15	7:14	7:14	7:15
13C6-PFDA			7:38	7:39	7:39	7:39	7:39	7:39	7:38	7:38	7:39
13C7-PFUnA			8:00	8:01	8:01	8:01	8:01	8:01	8:00	8:00	8:01
13C2-PFDoA			8:26	8:26	8:26	8:26	8:26	8:26	8:26	8:26	8:26
13C2-PFTeDA			9:22	9:22	9:22	9:22	9:22	9:22	9:22	9:22	9:22
13C3-PFBS			4:59	4:59	4:59	4:59	4:59	4:59	4:59	4:59	4:59
13C3-PFHxS			6:44	6:44	6:44	6:44	6:44	6:44	6:44	6:44	6:44
13C8-PFOS			7:46	7:46	7:46	7:46	7:46	7:46	7:46	7:46	7:46
13C2-4:2 FTS			4:50	4:51	4:51	4:51	4:51	4:51	4:51	4:51	4:51
13C2-6:2 FTS			6:14	6:15	6:15	6:14	6:14	6:14	6:14	6:14	6:14
13C2-8:2 FTS			7:29	7:29	7:29	7:30	7:30	7:30	7:29	7:29	7:29
13C8-PFOSA			8:32	8:32	8:32	8:32	8:32	8:32	8:32	8:32	8:32
D3-N-MeFOSA			9:50	9:50	9:50	9:50	9:50	9:50	9:50	9:50	9:50
D5-N-EtFOSA			10:09	10:09	10:09	10:09	10:09	10:09	10:08	10:09	10:09
D3-MeFOSAA			7:40	7:40	7:40	7:40	7:40	7:40	7:40	7:40	7:40
D5-EtFOSAA			7:48	7:48	7:48	7:49	7:49	7:49	7:48	7:48	7:48
d7-NMe-FOSE			9:41	9:41	9:41	9:41	9:41	9:42	9:41	9:41	9:41
d9-NEt-FOSE			10:00	10:00	10:00	10:00	10:00	10:01	10:00	10:00	10:00

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Kristina Coleman _____

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Report Filename: PFOA_FC_LC_30-Aug-2018_FC8W__Form3D_GS77716.html; Workgroup: WG65265; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 4A
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 30-Aug-2018

VER Data Filename: FC8W_276 S: 9

Instrument ID: LC MS/MS

Analysis Date: 15-Sep-2018

LC Column ID: C18

Analysis Time: 01:16:29

COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
PFBA		2:24	41.0	41.0	100
PFPeA		4:25	20.4	20.5	100
PFHxA		4:58	10.3	10.1	98.7
PFHpA		5:37	10.3	10.3	100
PFOA		6:32	10.3	10.6	103
PFNA		7:12	10.0	9.90	99.0
PFDA		7:38	10.0	10.5	105
PFUnA		8:00	10.0	9.86	98.6
PFDoA		8:26	10.0	10.9	109
PFTTrDA		8:54	10.0	10.2	102
PFTeDA		9:21	10.0	10.5	105
PFBS		4:57	10.3	10.7	104
PFPeS		5:42	9.50	8.95	94.2
PFHxS		6:40	10.3	10.4	101
PFHpS		7:20	9.50	9.38	98.8
PFOS		7:45	10.3	10.6	103
PFNS		8:10	9.50	9.77	103
PFDS		8:37	10.3	10.1	98.9
PFDoS		9:32	9.50	9.22	97.0
4:2 FTS		4:49	40.0	44.8	112
6:2 FTS		6:11	36.0	36.1	100
8:2 FTS		7:28	40.0	38.7	96.6
PFOSA		8:32	10.3	10.3	100
N-MeFOSA		9:51	11.5	11.8	102
N-EtFOSA		10:06	25.0	25.2	101
MeFOSAA		7:39	10.0	10.8	108
EtFOSAA		7:48	10.0	9.03	90.3
N-MeFOSE		9:44	102	104	102
N-EtFOSE		10:00	76.5	77.6	101

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

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Report Filename: PFOA_FC_LC_FC8W_276S9__Form4A_SJ2433600.html; Workgroup: WG65265; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 4B
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 30-Aug-2018

VER Data Filename: FC8W_276 S: 9

Instrument ID: LC MS/MS

Analysis Date: 15-Sep-2018

LC Column ID: C18

Analysis Time: 01:16:29

LABELLED COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
13C4-PFBA		2:23	40.0	39.9	99.8
13C5-PFPeA		4:25	20.0	21.9	110
13C5-PFHxA		4:58	10.0	10.9	109
13C4-PFHpA		5:37	10.0	9.84	98.4
13C8-PFOA		6:31	10.0	10.2	102
13C9-PFNA		7:12	5.00	4.92	98.4
13C6-PFDA		7:37	5.00	5.09	102
13C7-PFUnA		8:00	5.00	5.56	111
13C2-PFDoA		8:26	5.00	4.92	98.5
13C2-PFTeDA		9:21	5.00	4.99	99.9
13C3-PFBS		4:57	9.30	8.85	95.2
13C3-PFHxS		6:40	9.30	9.20	99.0
13C8-PFOS		7:45	9.30	9.45	102
13C2-4:2 FTS		4:49	20.0	18.5	92.6
13C2-6:2 FTS		6:12	20.0	19.8	99.1
13C2-8:2 FTS		7:28	20.0	18.1	90.6
13C8-PFOSA		8:32	10.0	10.4	104
D3-N-MeFOSA		9:51	10.0	9.48	94.8
D5-N-EtFOSA		10:06	10.0	10.9	109
D3-MeFOSAA		7:39	20.0	19.6	97.8
D5-EtFOSAA		7:48	20.0	19.4	97.2
d7-NMe-FOSE		9:43	100	98.5	98.5
d9-NEt-FOSE		9:59	100	97.1	97.1

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

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Report Filename: PFOA_FC_LC_FC8W_276S9__Form4B_SJ2433600.html; Workgroup: WG65265; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 4A
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 30-Aug-2018

VER Data Filename: FC8W_276 S: 21

Instrument ID: LC MS/MS

Analysis Date: 15-Sep-2018

LC Column ID: C18

Analysis Time: 03:58:06

COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
PFBA		2:23	41.0	41.3	101
PFPeA		4:25	20.4	20.8	102
PFHxA		4:58	10.3	10.5	102
PFHpA		5:37	10.3	10.2	99.7
PFOA		6:32	10.3	10.1	98.7
PFNA		7:13	10.0	10.5	105
PFDA		7:38	10.0	9.71	97.1
PFUnA		8:01	10.0	10.3	103
PFDoA		8:26	10.0	10.3	103
PFTTrDA		8:53	10.0	10.8	108
PFTeDA		9:21	10.0	10.7	107
PFBS		4:57	10.3	9.89	96.5
PFPeS		5:42	9.50	9.33	98.2
PFHxS		6:41	10.3	10.5	102
PFHpS		7:21	9.50	9.62	101
PFOS		7:46	10.3	10.4	101
PFNS		8:10	9.50	9.77	103
PFDS		8:37	10.3	10.2	99.4
PFDoS		9:32	9.50	9.14	96.2
4:2 FTS		4:49	40.0	41.9	105
6:2 FTS		6:12	36.0	36.0	100
8:2 FTS		7:29	40.0	40.7	102
PFOSA		8:32	10.3	10.3	101
N-MeFOSA		9:51	11.5	11.3	98.5
N-EtFOSA		10:07	25.0	25.8	103
MeFOSAA		7:40	10.0	10.7	107
EtFOSAA		7:48	10.0	9.60	96.0
N-MeFOSE		9:45	102	100	98.4
N-EtFOSE		10:00	76.5	78.7	103

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

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Report Filename: PFOA_FC_LC_FC8W_276S21__Form4A_SJ2433614.html; Workgroup: WG65265; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 4B
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 30-Aug-2018

VER Data Filename: FC8W_276 S: 21

Instrument ID: LC MS/MS

Analysis Date: 15-Sep-2018

LC Column ID: C18

Analysis Time: 03:58:06

LABELLED COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
13C4-PFBA		2:22	40.0	39.6	98.9
13C5-PFPeA		4:25	20.0	21.2	106
13C5-PFHxA		4:58	10.0	10.0	100
13C4-PFHpA		5:37	10.0	10.2	102
13C8-PFOA		6:32	10.0	10.3	103
13C9-PFNA		7:13	5.00	4.80	96.0
13C6-PFDA		7:38	5.00	5.55	111
13C7-PFUnA		8:00	5.00	5.28	106
13C2-PFDoA		8:26	5.00	5.24	105
13C2-PFTeDA		9:21	5.00	4.98	99.6
13C3-PFBS		4:57	9.30	9.56	103
13C3-PFHxS		6:40	9.30	9.03	97.1
13C8-PFOS		7:45	9.30	9.07	97.5
13C2-4:2 FTS		4:49	20.0	19.3	96.5
13C2-6:2 FTS		6:12	20.0	20.5	103
13C2-8:2 FTS		7:29	20.0	17.5	87.5
13C8-PFOSA		8:32	10.0	9.83	98.3
D3-N-MeFOSA		9:51	10.0	8.96	89.6
D5-N-EtFOSA		10:06	10.0	9.64	96.4
D3-MeFOSAA		7:40	20.0	18.1	90.4
D5-EtFOSAA		7:48	20.0	18.3	91.3
d7-NMe-FOSE		9:43	100	94.3	94.3
d9-NEt-FOSE		9:59	100	92.8	92.8

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

For Axs Internal Use Only [XSL Template: FC-Form4B.xsl; Created: 21-Sep-2018 12:50:27; Application: XMLTransformer-1.16.50;
Report Filename: PFOA_FC_LC_FC8W_276S21__Form4B_SJ2433614.html; Workgroup: WG65265; Design ID: 3321]

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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			

Accreditation Scope

SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 40

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **
	Endosulphan sulphate	EPA 8081	MLA-007				Y			Y	Y	Y	Y	Y																				
		EPA 1699	MLA-028				Y								Y																		Y	
		SGS AXYS MLA-028	MLA-028	Y	Y	Y							Y	Y	Y		Y							Y	Y	Y					Y		Y	
		SGS AXYS MLA-007	MLA-007	Y	Y	Y									Y		Y							Y	Y	Y					Y		Y	
		EPA 608	MLA-007																							Y		Y	Y		Y		Y	
		EPA 8081	MLA-007				Y				Y	Y	Y	Y	Y																			
		EPA 1699	MLA-028				Y								Y											Y							Y	
		SGS AXYS MLA-028	MLA-028	Y	Y	Y							Y	Y	Y		Y							Y	Y	Y				Y		Y		
	Endrin	SGS AXYS MLA-007	MLA-007	Y	Y	Y									Y		Y							Y	Y	Y						Y		Y
		EPA 608	MLA-007																							Y		Y	Y		Y		Y	
		EPA 8081	MLA-007				Y				Y	Y	Y	Y	Y																			
		EPA 1699	MLA-028				Y								Y											Y							Y	
	Endrin aldehyde	SGS AXYS MLA-028	MLA-028	Y	Y	Y							Y	Y	Y		Y							Y	Y	Y				Y		Y		
		SGS AXYS MLA-007	MLA-007	Y	Y	Y									Y		Y							Y	Y	Y						Y		Y
		EPA 608	MLA-007																							Y		Y	Y		Y		Y	
		EPA 8081	MLA-007				Y				Y	Y	Y	Y	Y											Y							Y	
	Endrin ketone	EPA 1699	MLA-028				Y								Y											Y							Y	
		SGS AXYS MLA-028	MLA-028	Y	Y	Y							Y	Y	Y		Y							Y	Y	Y				Y		Y		
		SGS AXYS MLA-007	MLA-007	Y	Y	Y									Y		Y							Y	Y	Y						Y		Y
		Gamma-HCH (Lindane)	EPA 625	MLA-007																							Y		Y	Y		Y		Y
	EPA 8270		MLA-007				Y				Y	Y	Y	Y	Y																			
	EPA 1699		MLA-028				Y								Y											Y							Y	
	SGS AXYS MLA-028		MLA-028	Y	Y	Y							Y	Y	Y		Y							Y	Y	Y				Y		Y		
	SGS AXYS MLA-007		MLA-007	Y	Y	Y									Y		Y							Y	Y	Y						Y		Y
	Heptachlor	EPA 625	MLA-007																							Y		Y	Y		Y		Y	
		EPA 8270	MLA-007				Y				Y	Y	Y	Y	Y																			
		EPA 1699	MLA-028				Y								Y											Y							Y	
		SGS AXYS MLA-028	MLA-028	Y	Y	Y							Y	Y	Y		Y							Y	Y	Y				Y		Y		
	Heptachlor epoxide	SGS AXYS MLA-007	MLA-007	Y	Y	Y									Y		Y							Y	Y	Y						Y		Y
		EPA 608	MLA-007																							Y		Y	Y		Y		Y	
		EPA 8081	MLA-007				Y				Y	Y	Y	Y	Y																			
		EPA 1699	MLA-028				Y								Y											Y							Y	
	Hexachlorobenzene	SGS AXYS MLA-028	MLA-028	Y	Y	Y							Y	Y	Y		Y							Y	Y	Y				Y		Y		
		SGS AXYS MLA-007	MLA-007	Y	Y	Y									Y		Y							Y	Y	Y						Y		Y
		EPA 1625	MLA-007																							Y		Y					Y	
		EPA 8270	MLA-007				Y				Y	Y	Y	Y	Y																			
		EPA 1699	MLA-028				Y								Y											Y							Y	
	Methoxychlor	SGS AXYS MLA-028	MLA-028	Y	Y	Y							Y	Y	Y		Y							Y	Y	Y				Y		Y		
		SGS AXYS MLA-007	MLA-007	Y	Y	Y									Y		Y							Y	Y	Y						Y		Y
		EPA 608	MLA-007																							Y		Y	Y		Y		Y	
EPA 8081		MLA-007				Y				Y	Y	Y	Y	Y																				
EPA 1699		MLA-028				Y								Y											Y							Y		
Mirex	SGS AXYS MLA-028	MLA-028	Y	Y	Y							Y	Y	Y		Y							Y	Y	Y				Y		Y			
	SGS AXYS MLA-007	MLA-007	Y	Y	Y									Y		Y							Y	Y	Y						Y		Y	
	EPA 8270	MLA-007				Y				Y	Y	Y	Y	Y											Y		Y	Y		Y		Y		
	EPA 1699	MLA-028				Y								Y											Y							Y		

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SGS AXYS Analytical Services Ltd. file ref.: ACC-101 Rev. 40																																																															
				Serum										Solids										Tissue										Urine										Water										Water, Non-Potable									
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **																													
	Oxychlordane	SGS AXYS MLA-028	MLA-028	Y	Y	Y						Y		Y		Y							Y	Y	Y					Y			Y																														
		SGS AXYS MLA-007	MLA-007	Y	Y	Y									Y		Y							Y	Y							Y																															
		EPA 8270	MLA-007			Y						Y													Y								Y																														
		EPA 1699	MLA-028			Y								Y											Y								Y																														
	Toxaphene	SGS AXYS MLA-028	MLA-028	Y	Y	Y						Y		Y		Y						Y		Y	Y				Y				Y																														
		SGS AXYS MLA-007	MLA-007	Y	Y	Y											Y					Y		Y	Y								Y																														
		EPA 8270	MLA-007									Y																																																			
		SGS AXYS MLA-007	MLA-007		Y												Y							Y																																							
	trans-Chlordane (gamma-Chlordane)	EPA 8270	MLA-007				Y				Y		Y	Y	Y											Y		Y			Y		Y																														
		EPA 1699	MLA-028				Y								Y											Y							Y																														
		SGS AXYS MLA-028	MLA-028	Y	Y	Y						Y		Y		Y		Y						Y	Y			Y					Y																														
		SGS AXYS MLA-007	MLA-007	Y	Y	Y										Y		Y						Y	Y								Y																														
	trans-Nonachlor	EPA 8270	MLA-007				Y					Y		Y												Y							Y																														
		EPA 1699	MLA-028				Y								Y											Y							Y																														
		SGS AXYS MLA-028	MLA-028	Y	Y	Y						Y		Y		Y		Y						Y	Y			Y					Y																														
		SGS AXYS MLA-007	MLA-007	Y	Y	Y										Y		Y								Y							Y																														
PAH	1,2,6-Trimethylphenanthrene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	1,2-Dimethylnaphthalene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	1,4,6,7-Tetramethylnaphthalene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	1,7-Dimethylfluorene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	1,7-Dimethylphenanthrene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	1,8-Dimethylphenanthrene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	1-Methylchrysene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	1-Methylnaphthalene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	1-Methylphenanthrene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	2,3,5-Trimethylnaphthalene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	2,3,6-Trimethylnaphthalene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	2,4-Dimethyldibenzothiophene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	2,6-Dimethylnaphthalene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	2,6-Dimethylphenanthrene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	2-Methylantracene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	2-Methyldibenzothiophene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	2-Methylfluorene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	2-Methylnaphthalene	EPA 1625	MLA-021																															Y																													
		EPA 8270	MLA-021				Y				Y				Y											Y																																					
		SGS AXYS MLA-021	MLA-021		Y	Y									Y									Y									Y																														
	2-Methylphenanthrene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	3,6-Dimethylphenanthrene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	3-Methyldibenzothiophene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	3-Methylfluoranthene/ Benzo(a)fluorene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	3-Methylphenanthrene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	5,9-Dimethylchrysene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	5/6-Methylchrysenes	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	7-Methylbenzo(a)pyrene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	9/4-Methylphenanthrenes	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	Acenaphthene	EPA 1625	MLA-021																						Y			Y	Y				Y																														
		EPA 8270	MLA-021					Y			Y	Y			Y	Y													Y																																		
		SGS AXYS MLA-021	MLA-021		Y	Y										Y		Y						Y									Y																														
	Acenaphthylene	EPA 1625	MLA-021																									Y																																			
		EPA 8270	MLA-021					Y			Y	Y			Y	Y													Y		Y	Y		Y																													

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SGS AXYS Analytical Services Ltd. file ref.: ACC-101 Rev. 40																					California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **		California DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025		CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **														
		SGS AXYS MLA-033	MLA-033	Y	Y							Y				Y							Y																											
	BDE 154 2,2',4,4',5',6-hexabromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 155 2,2',4,4',6,6'-hexabromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 166 2,3,4,4',5,6-hexabromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 17 2,2',4-tribromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 181 2,2',3,4,4',5,6-heptabromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 190 2,3,3',4,4',5,6-heptabromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 206 2,2',3,3',4,4',5,5',6-nonabromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 207 2,2',3,3',4,4',5,6,6'-nonabromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 208 2,2',3,3',4,5,5',6,6'-nonabromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 209 Decabromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 25 2,3',4-tribromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 28 2,4,4'-tribromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 30 2,4,6-tribromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 35 3,3',4-tribromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 37 3,4,4'-tribromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 47 2,2',4,4'-tetrabromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 49 2,2',4,5'-tetrabromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 66 2,3',4,4'-tetrabromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 7 2,4-dibromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 75 2,4,4',6-tetrabromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 77 3,3',4,4'-tetrabromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 8 2,4'-dibromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 85 2,2',3,4,4'-pentabromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE 99 2,2',4,4',5-pentabromodiphenylether	EPA 1614	MLA-033									Y																		Y																				
		SGS AXYS MLA-033	MLA-033	Y	Y											Y						Y																												
	BDE-183 2,2',3,4,4',5',6-heptabromodiphenylether	EPA 1614	MLA-033									Y																		Y																				

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **						
	BDE-33 2',3,4-tribromodiphenylether	SGS AXYS MLA-033	MLA-033	Y	Y											Y							Y																	
		EPA 1614	MLA-033										Y																	Y										
		SGS AXYS MLA-033	MLA-033	Y	Y												Y							Y																
PCB Aroclors	"PCBs" category (CA only)	EPA 625	MLA-007																						Y															
		EPA 8270	MLA-007			Y																																		
		EPA 1668	MLA-010				Y						Y	Y												Y						Y	Y							
	PCB Aroclor 1016	EPA 625	MLA-007																							Y			Y	Y		Y	Y							
		EPA 8270	MLA-007				Y				Y	Y			Y											Y			Y	Y		Y	Y							
		SGS AXYS MLA-010	MLA-010				Y							Y												Y							Y							
	PCB Aroclor 1016/1242	SGS AXYS MLA-007	MLA-007		Y	Y									Y		Y						Y	Y	Y								Y							
		EPA 8270	MLA-007									Y																												
		EPA 1668	MLA-010				Y							Y	Y											Y					Y	Y								
	PCB Aroclor 1221	EPA 625	MLA-007																						Y				Y	Y		Y	Y							
		EPA 8270	MLA-007			Y					Y	Y	Y		Y										Y			Y	Y		Y	Y								
		SGS AXYS MLA-010	MLA-010				Y								Y										Y								Y							
	PCB Aroclor 1232	SGS AXYS MLA-007	MLA-007		Y	Y									Y		Y						Y	Y	Y								Y							
		EPA 1668	MLA-010				Y							Y	Y										Y						Y	Y								
		EPA 625	MLA-007																						Y				Y	Y		Y	Y							
	PCB Aroclor 1242	EPA 8270	MLA-007				Y				Y	Y	Y		Y										Y									Y						
		SGS AXYS MLA-010	MLA-010				Y								Y										Y								Y							
		SGS AXYS MLA-007	MLA-007		Y	Y									Y		Y						Y	Y	Y								Y							
	PCB Aroclor 1248	EPA 1668	MLA-010				Y							Y	Y										Y							Y	Y							
		EPA 625	MLA-007																						Y				Y	Y		Y	Y							
		EPA 8270	MLA-007				Y				Y	Y	Y		Y										Y				Y	Y		Y	Y							
	PCB Aroclor 1254	SGS AXYS MLA-010	MLA-010				Y								Y										Y									Y						
		SGS AXYS MLA-007	MLA-007		Y	Y									Y		Y						Y	Y	Y								Y							
		EPA 1668	MLA-010				Y							Y	Y										Y							Y	Y							
	PCB Aroclor 1260	EPA 625	MLA-007																						Y				Y	Y		Y	Y							
		EPA 8270	MLA-007				Y				Y	Y	Y		Y										Y				Y	Y		Y	Y							
		SGS AXYS MLA-010	MLA-010				Y								Y										Y								Y							
	PCB Aroclor 1268	SGS AXYS MLA-007	MLA-007		Y	Y									Y		Y						Y	Y	Y								Y							
		SGS AXYS MLA-007	MLA-007		Y												Y																							
		EPA 1668	MLA-010				Y				Y	Y	Y	Y	Y	Y						Y			Y				Y	Y	Y	Y	Y							
	PCB congeners	PCB 1 2-Chlorobiphenyl	EPA 8270	MLA-007									Y																											
			SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y						Y	Y	Y							Y							
			EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y									Y				Y	Y	Y	Y	Y	Y						
		PCB 10 2,6-Dichlorobiphenyl	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y						Y	Y	Y							Y							
			EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y									Y				Y	Y	Y	Y	Y	Y						
			SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y						Y	Y	Y							Y	Y						
	PCB 100 2,2',4,4',6-Pentachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y											Y			Y	Y	Y	Y	Y							
		EPA 8270	MLA-007										Y																											
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y						Y	Y	Y				Y	Y	Y	Y	Y							

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SGS AXYS Analytical Services Ltd. file ref.: ACC-101 Rev. 40																																																															
				Serum										Solids										Tissue										Urine										Water										Water, Non-Potable									
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **																													
	PCB 101 2,2',4,5,5'-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y				Y		Y		Y				Y	Y																													
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y		Y		Y		Y		Y		Y		Y				Y																														
	PCB 101/90/89	EPA 8270	MLA-007									Y																																																			
		SGS AXYS MLA-007	MLA-007		Y												Y							Y																																							
	PCB 102 2,2',4,5,6'-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y																													
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y		Y		Y		Y		Y		Y						Y																														
	PCB 103 2,2',4,5',6-Pentachlorobiphenyl	EPA 1668	MLA-010					Y		Y	Y	Y	Y	Y	Y						Y						Y		Y	Y	Y	Y		Y	Y																												
		EPA 8270	MLA-007										Y																																																		
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y		Y		Y		Y		Y		Y							Y																													
	PCB 104 2,2',4,6,6'-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y		Y	Y	Y		Y	Y																												
		EPA 8270	MLA-007										Y														Y		Y	Y	Y	Y		Y	Y																												
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y		Y		Y		Y		Y		Y							Y																													
	PCB 105 2,3,3',4,4'-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y		Y	Y	Y		Y	Y																												
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y		Y		Y		Y		Y		Y		Y	Y	Y		Y	Y																													
	PCB 105/127	EPA 8270	MLA-007										Y																																																		
		SGS AXYS MLA-007	MLA-007		Y												Y							Y																																							
	PCB 106 2,3,3',4,5-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y		Y	Y	Y		Y	Y																												
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y		Y		Y		Y		Y		Y							Y																													
	PCB 107 2,3,3',4',5-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y		Y	Y	Y		Y	Y																												
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y		Y		Y		Y		Y		Y							Y																													
	PCB 107/109	EPA 8270	MLA-007										Y																																																		
		SGS AXYS MLA-007	MLA-007		Y												Y							Y			Y																																				
	PCB 108 2,3,3',4,5'-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y		Y	Y	Y		Y	Y																												
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y		Y		Y		Y		Y		Y							Y																													
	PCB 109 2,3,3',4,6-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y		Y	Y	Y		Y	Y																												
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y		Y		Y		Y		Y		Y							Y																													
	PCB 11 3,3'-Dichlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y		Y	Y	Y		Y	Y																												
		EPA 8270	MLA-007										Y																																																		
	PCB 110 2,3,3',4',6-Pentachlorobiphenyl	SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y		Y		Y		Y		Y		Y							Y																													
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y		Y	Y	Y		Y	Y																												
	EPA 8270	MLA-007										Y																																																			
	SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y		Y		Y		Y		Y		Y							Y																														
	SGS AXYS MLA-007	MLA-007		Y												Y							Y		Y																																						
PCB 111 2,3,3',5,5'-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y		Y	Y	Y		Y	Y																													
	SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y		Y		Y		Y		Y		Y							Y																														
PCB 111/117	EPA 8270	MLA-007										Y																																																			
	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y		Y	Y	Y		Y	Y																													
PCB 112 2,3,3',5,6-Pentachlorobiphenyl	EPA 8270	MLA-007										Y																																																			
	SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y		Y		Y		Y		Y		Y							Y																														
PCB 113 2,3,3',5',6-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y		Y	Y	Y		Y	Y																													
	EPA 8270	MLA-007										Y																																																			
	SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y		Y		Y		Y		Y		Y							Y																														
PCB 114 2,3,4,4',5-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y		Y	Y	Y		Y	Y																													
	EPA 8270	MLA-007										Y																																																			
	SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y		Y		Y		Y		Y		Y							Y																														
PCB 115 2,3,4,4',6-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y		Y	Y	Y		Y	Y																													
	SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y		Y		Y		Y		Y		Y							Y																														
PCB 116 2,3,4,5,6-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y		Y	Y	Y		Y	Y																													
	SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y		Y		Y		Y		Y		Y							Y																														
PCB 117 2,3,4',5,6-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y		Y	Y	Y		Y	Y																													

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Accreditation Scope				Serum	Solids	Tissue	Urine	Water	Water, Non-Potable																									
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID																															
				CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **
	PCB 158/160	EPA 8270	MLA-007							Y							Y																	
		SGS AXYS MLA-007	MLA-007		Y												Y							Y										
	PCB 159 2,3,3',4,5,5'-Hexachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y					Y						Y	Y	Y	Y	Y	Y		Y	Y
EPA 8270		MLA-007									Y										Y													
SGS AXYS MLA-010		MLA-010	Y	Y	Y									Y		Y		Y		Y		Y		Y								Y		
SGS AXYS MLA-007		MLA-007		Y													Y				Y		Y											
PCB 16 2,2',3-Trichlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y	Y		Y	Y	
	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y		Y		Y		Y		Y		Y							Y	
PCB 16/32	EPA 8270	MLA-007										Y																						
	SGS AXYS MLA-007	MLA-007		Y													Y						Y											
PCB 160 2,3,3',4,5,6-Hexachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y	Y		Y	Y	
	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y		Y		Y		Y		Y									Y	
	SGS AXYS MLA-007	MLA-007		Y													Y						Y		Y								Y	
	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y	Y		Y	Y	
PCB 161 2,3,3',4,5',6-Hexachlorobiphenyl	EPA 8270	MLA-007									Y																							
	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y		Y		Y		Y		Y									Y	
	SGS AXYS MLA-007	MLA-007		Y													Y						Y		Y									
	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y	Y		Y	Y	
PCB 162 2,3,3',4',5,5'-Hexachlorobiphenyl	EPA 8270	MLA-007									Y																							
	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y		Y		Y		Y		Y									Y	
	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y	Y		Y	Y	
	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y		Y		Y		Y		Y									Y	
PCB 163 2,3,3',4',5,6-Hexachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y	Y		Y	Y	
	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y		Y		Y		Y		Y									Y	
	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y	Y		Y	Y	
	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y		Y		Y		Y		Y									Y	
PCB 164 2,3,3',4',5',6-Hexachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y	Y		Y	Y	
	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y		Y		Y		Y		Y									Y	
	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y	Y		Y	Y	
	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y		Y		Y		Y		Y									Y	
PCB 165 2,3,3',5,5',6-Hexachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y	Y		Y	Y	
	EPA 8270	MLA-007									Y																							
	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y		Y		Y		Y		Y									Y	
	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y	Y		Y	Y	
PCB 166 2,3,4,4',5,6-Hexachlorobiphenyl	EPA 8270	MLA-007									Y																							
	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y		Y		Y		Y		Y									Y	
	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y	Y		Y	Y	
	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y		Y		Y		Y		Y									Y	
PCB 167 2,3',4,4',5,5'-Hexachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y	Y		Y	Y	
	EPA 8270	MLA-007									Y																							
	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y		Y		Y		Y		Y									Y	
PCB 168 2,3',4,4',5',6-Hexachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y	Y		Y	Y	
	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y		Y		Y		Y		Y									Y	
PCB 169 3,3',4,4',5,5'-Hexachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y	Y		Y	Y	
	EPA 8270	MLA-007									Y																							
	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y		Y		Y		Y		Y									Y	
	SGS AXYS MLA-007	MLA-007		Y																														
PCB 17 2,2',4-Trichlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y	Y		Y	Y	
	EPA 8270	MLA-007									Y																							
	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y		Y		Y		Y		Y									Y	
	SGS AXYS MLA-007	MLA-007		Y																			Y											
PCB 170 2,2',3,3',4,4',5-Heptachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y		Y	Y		
	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y		Y		Y		Y		Y									Y	
	SGS AXYS MLA-901	MLA-901	Y																															
PCB 170/190	EPA 8270	MLA-007									Y																							
	SGS AXYS MLA-007	MLA-007		Y														Y																
PCB 171 2,2',3,3',4,4',6-Heptachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y		Y	Y		
	EPA 8270	MLA-007									Y																							

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				Serum	Solids										Tissue					Urine	Water	Water, Non-Potable												
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **
	PCB 184 2,2',3,4,4',6,6'-Heptachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y				Y		Y		Y			Y	Y	
		EPA 8270	MLA-007										Y																					
		SGS AXYS MLA-010	MLA-010	Y	Y										Y		Y				Y		Y	Y									Y	
	PCB 185 2,2',3,4,5,5',6-Heptachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y	Y						Y				Y		Y		Y			Y	Y
		EPA 8270	MLA-007										Y																					
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y	Y									Y	
	PCB 186 2,2',3,4,5,6,6'-Heptachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y	Y						Y				Y		Y		Y			Y	Y
		EPA 8270	MLA-007										Y																					
		SGS AXYS MLA-010	MLA-010	Y	Y		Y										Y				Y		Y	Y										
	PCB 187 2,2',3,4',5,5',6-Heptachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y	Y						Y				Y		Y		Y			Y	Y
		SGS AXYS MLA-010	MLA-010	Y	Y		Y									Y		Y			Y		Y	Y									Y	
		SGS AXYS MLA-901	MLA-901	Y																	Y		Y	Y									Y	
	PCB 187/182	EPA 8270	MLA-007										Y																					
		SGS AXYS MLA-007	MLA-007		Y													Y						Y										
	PCB 188 2,2',3,4',5,6,6'-Heptachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y	Y						Y				Y		Y		Y			Y	Y
		EPA 8270	MLA-007										Y																					
		SGS AXYS MLA-010	MLA-010	Y	Y		Y									Y		Y			Y		Y	Y									Y	
	PCB 189 2,3,3',4,4',5,5'-Heptachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y	Y						Y				Y		Y		Y			Y	Y
		EPA 8270	MLA-007										Y																					
		SGS AXYS MLA-010	MLA-010	Y	Y		Y									Y		Y			Y		Y	Y									Y	
	PCB 19 2,2',6-Trichlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y	Y						Y				Y		Y		Y			Y	Y
		EPA 8270	MLA-007										Y																					
		SGS AXYS MLA-010	MLA-010	Y	Y		Y									Y		Y			Y		Y	Y									Y	
	PCB 190 2,3,3',4,4',5,6-Heptachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y	Y						Y				Y		Y		Y			Y	Y
		SGS AXYS MLA-010	MLA-010	Y	Y		Y									Y		Y			Y		Y	Y									Y	
	PCB 191 2,3,3',4,4',5',6-Heptachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y	Y						Y				Y		Y		Y			Y	Y
		EPA 8270	MLA-007										Y																					
		SGS AXYS MLA-010	MLA-010	Y	Y		Y									Y		Y			Y		Y	Y									Y	
PCB 192 2,3,3',4,5,5',6-Heptachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y	Y						Y				Y		Y		Y			Y	Y	
	SGS AXYS MLA-010	MLA-010	Y	Y		Y									Y		Y			Y		Y	Y									Y		
	EPA 8270	MLA-007										Y																						
PCB 193 2,3,3',4',5,5',6-Heptachlorobiphenyl	SGS AXYS MLA-010	MLA-010	Y	Y		Y									Y		Y			Y		Y	Y									Y		
	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y	Y						Y				Y		Y		Y			Y	Y	
	EPA 8270	MLA-007										Y																						
PCB 194 2,2',3,3',4,4',5,5'-Octachlorobiphenyl	SGS AXYS MLA-010	MLA-010																																
	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y	Y						Y				Y		Y		Y			Y	Y	
	EPA 8270	MLA-007										Y																						
PCB 195 2,2',3,3',4,4',5,6-Octachlorobiphenyl	SGS AXYS MLA-010	MLA-010																																
	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y	Y						Y				Y		Y		Y			Y	Y	
	EPA 8270	MLA-007										Y																						
PCB 196 2,2',3,3',4,4',5,6'-Octachlorobiphenyl	SGS AXYS MLA-010	MLA-010				Y																												
	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y	Y																			
	EPA 8270	MLA-007										Y																						
PCB 196/203	SGS AXYS MLA-010	MLA-010				Y																												
	EPA 1668	MLA-010				Y																												
	EPA 8270	MLA-007										Y																						

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				Serum	Solids									Tissue		Urine	Water	Water, Non-Potable																
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **
		EPA 8270	MLA-007								Y																							
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y					Y		Y								Y		
		SGS AXYS MLA-007	MLA-007		Y													Y						Y										
	PCB 21 2,3,4-Trichlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y							Y		Y		Y		Y	Y	Y		Y	Y	
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y		Y	Y	
	PCB 22 2,3,4'-Trichlorobiphenyl	EPA 8270	MLA-007									Y																						
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y							Y		Y		Y		Y	Y	Y				
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y		Y	Y	
	PCB 23 2,3,5-Trichlorobiphenyl	EPA 8270	MLA-007									Y																						
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y							Y		Y		Y		Y	Y	Y		Y	Y	
		SGS AXYS MLA-007	MLA-007		Y													Y						Y		Y								
	PCB 23/34	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y												Y		Y	Y	Y		Y	Y
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y							Y		Y		Y		Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																						
	PCB 24 2,3,6-Trichlorobiphenyl	SGS AXYS MLA-007	MLA-007		Y													Y						Y		Y								
		EPA 8270	MLA-007									Y																						
		SGS AXYS MLA-007	MLA-007		Y													Y						Y		Y								
	PCB 24/27	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y												Y		Y	Y	Y		Y	Y
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y							Y		Y		Y		Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																						
	PCB 25 2,3',4-Trichlorobiphenyl	SGS AXYS MLA-007	MLA-007		Y													Y						Y		Y								
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																						
	PCB 26 2,3',5-Trichlorobiphenyl	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y							Y		Y		Y							Y	
		SGS AXYS MLA-007	MLA-007		Y													Y						Y		Y								
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y		Y	Y	
	PCB 26 2,3',5-Trichlorobiphenyl	EPA 8270	MLA-007									Y																						
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y							Y		Y		Y							Y	
		SGS AXYS MLA-007	MLA-007		Y													Y						Y		Y								
	PCB 27 2,3',6-Trichlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y												Y		Y	Y	Y		Y	Y
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y							Y		Y		Y		Y	Y	Y		Y	Y	
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y		Y	Y	
	PCB 28 2,4,4'-Trichlorobiphenyl	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y							Y		Y		Y		Y	Y	Y		Y	Y	
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																						
	PCB 29 2,4,5-Trichlorobiphenyl	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y							Y		Y		Y		Y	Y	Y		Y	Y	
		SGS AXYS MLA-007	MLA-007		Y													Y						Y		Y								
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y		Y	Y	
	PCB 3 4-Chlorobiphenyl	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y							Y		Y		Y		Y	Y	Y		Y	Y	
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																						
	PCB 30 2,4,6-Trichlorobiphenyl	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y							Y		Y		Y		Y	Y	Y		Y	Y	
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y							Y		Y		Y		Y	Y	Y		Y	Y	
	PCB 31 2,4',5-Trichlorobiphenyl	EPA 8270	MLA-007									Y																						
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y							Y		Y		Y		Y	Y	Y		Y	Y	
		SGS AXYS MLA-007	MLA-007		Y													Y						Y		Y								
	PCB 32 2,4',6-Trichlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y							Y		Y		Y		Y	Y	Y		Y	Y	
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y		Y	Y	
	PCB 33 2,3',4'-Trichlorobiphenyl	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y							Y		Y		Y		Y	Y	Y		Y	Y	
		EPA 1668	MLA-010																															
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y							Y		Y		Y		Y	Y	Y		Y	Y	
	PCB 33/20/21	EPA 8270	MLA-007									Y																						
		SGS AXYS MLA-007	MLA-007		Y																			Y										
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y		Y		Y		Y	Y	Y		Y	Y	
PCB 34 2,3',5'-Trichlorobiphenyl	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y							Y		Y		Y		Y	Y	Y		Y	Y		
	EPA 1668	MLA-010																																
	SGS AXYS MLA-007	MLA-007		Y																			Y		Y									

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Accreditation Scope																Serum	Solids													Tissue													Urine	Water	Water, Non-Potable
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **											
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y					Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y												
	PCB 64 2,3,4',6-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y		Y				Y			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y												
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y				Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y												
	PCB 65 2,3,5,6-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y		Y				Y			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y												
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y				Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y												
	PCB 66 2,3',4,4'-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y						Y			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y											
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y				Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y												
	PCB 66/80	EPA 8270	MLA-007									Y																																	
		SGS AXYS MLA-007	MLA-007		Y											Y								Y																					
	PCB 67 2,3',4,5-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y						Y					Y	Y	Y	Y	Y	Y	Y	Y	Y	Y											
		EPA 8270	MLA-007									Y																																	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y				Y		Y	Y	Y									Y												
	PCB 68 2,3',4,5'-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y						Y				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y											
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y				Y		Y	Y	Y									Y												
	PCB 69 2,3',4,6-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y						Y				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y											
		EPA 8270	MLA-007									Y																																	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y				Y		Y	Y	Y									Y												
	PCB 7 2,4-Dichlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y						Y				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y											
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y				Y		Y	Y	Y									Y												
	PCB 7/9	EPA 8270	MLA-007									Y																																	
	PCB 70 2,3',4',5-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y						Y				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y											
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y				Y		Y	Y	Y									Y												
	PCB 70/76	EPA 8270	MLA-007									Y																																	
		SGS AXYS MLA-007	MLA-007		Y											Y								Y																					
	PCB 71 2,3',4',6-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y						Y				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y											
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y				Y		Y	Y	Y									Y												
	PCB 72 2,3',5,5'-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y						Y				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y											
		EPA 8270	MLA-007									Y																																	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y				Y		Y	Y	Y									Y												
	PCB 73 2,3',5',6-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y						Y				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y											
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y				Y		Y	Y	Y									Y												
	PCB 74 2,4,4',5-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y						Y				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y											
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y				Y		Y	Y	Y									Y												
		SGS AXYS MLA-901	MLA-901	Y																																									
	PCB 74/61	EPA 8270	MLA-007									Y																																	
		SGS AXYS MLA-007	MLA-007		Y											Y								Y																					
	PCB 75 2,4,4',6-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y						Y				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y											
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y				Y		Y	Y	Y									Y												
	PCB 76 2,3',4',5'-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y						Y				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y											
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y				Y		Y	Y	Y									Y												
	PCB 77 3,3',4,4'-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y						Y				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y											
		EPA 8270	MLA-007									Y																																	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y				Y		Y	Y	Y									Y												
		SGS AXYS MLA-007	MLA-007		Y											Y								Y																					
	PCB 78 3,3',4,5-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y						Y				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y											
		EPA 8270	MLA-007									Y																																	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y				Y		Y	Y	Y									Y												
	PCB 79 3,3',4,5'-Tetrachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y						Y				Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y											
		EPA 8270	MLA-007									Y																																	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y				Y		Y	Y	Y									Y												

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				Serum										Solids										Tissue										Urine										Water										Water, Non-Potable									
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **																													
	PCB 8 2,4'-Dichlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y				Y		Y		Y	Y		Y	Y																														
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y		Y				Y																														
	PCB 8/5	EPA 8270	MLA-007									Y																																																			
		SGS AXYS MLA-007	MLA-007		Y												Y							Y																																							
	PCB 80 3,3',5,5'-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y																													
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y						Y																														
	PCB 81 3,4,4',5-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y																													
		EPA 8270	MLA-007									Y																																																			
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y																													
	PCB 82 2,2',3,3',4-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y																													
		EPA 8270	MLA-007										Y																																																		
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y																													
	PCB 83 2,2',3,3',5-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y																													
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y																													
	PCB 83/108	EPA 8270	MLA-007									Y																																																			
		SGS AXYS MLA-007	MLA-007		Y												Y							Y																																							
	PCB 84 2,2',3,3',6-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y																													
		EPA 8270	MLA-007										Y																																																		
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y																													
		SGS AXYS MLA-007	MLA-007		Y												Y							Y		Y																																					
	PCB 85 2,2',3,4,4'-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y																													
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y																													
	PCB 85/120	EPA 8270	MLA-007									Y																																																			
		SGS AXYS MLA-007	MLA-007		Y												Y							Y																																							
	PCB 86 2,2',3,4,5-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y																													
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y																													
	PCB 87 2,2',3,4,5'-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y																													
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y																													
	PCB 87/115/116	EPA 8270	MLA-007									Y																																																			
		SGS AXYS MLA-007	MLA-007		Y												Y							Y																																							
	PCB 88 2,2',3,4,6-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y																													
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y																													
	PCB 88/121	EPA 8270	MLA-007									Y																																																			
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y																													
	PCB 89 2,2',3,4,6'-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y																													
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y																													
	PCB 9 2,5-Dichlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y																													
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y						Y																														
	PCB 90 2,2',3,4',5-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y																													
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y																													
	PCB 91 2,2',3,4',6-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y																													
		EPA 8270	MLA-007									Y																																																			
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y																													
		SGS AXYS MLA-007	MLA-007		Y													Y						Y																																							
	PCB 92 2,2',3,5,5'-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y																													
		EPA 8270	MLA-007									Y																																																			
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y																													
	PCB 93 2,2',3,5,6-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y																													
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y																													
	PCB 94 2,2',3,5,6'-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y																													
		EPA 8270	MLA-007									Y																																																			

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum										Tissue									
				CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	Urine
		SGS AXYS MLA-010	MLA-010											Y									
		EPA 1668	MLA-010											Y									
	Sum - Pentachlorobiphenyls (BZ-83 + BZ-99)	SGS AXYS MLA-010	MLA-010											Y									
		EPA 1668	MLA-010											Y									
	Sum - Pentachlorobiphenyls (BZ-85 + BZ-116 + BZ-117)	SGS AXYS MLA-010	MLA-010											Y									
		EPA 1668	MLA-010											Y									
	Sum - Pentachlorobiphenyls (BZ-86 + BZ-87 + BZ 97 + BZ-109 + BZ-119 + BZ-125)	SGS AXYS MLA-010	MLA-010											Y									
		EPA 1668	MLA-010											Y									
	Sum - Pentachlorobiphenyls (BZ-86 + BZ-87 + BZ-97 + BZ-108 + BZ-119 +BZ-125)	SGS AXYS MLA-010	MLA-010											Y									
		EPA 1668	MLA-010											Y									
	Sum - Pentachlorobiphenyls (BZ-88 + BZ-91)	SGS AXYS MLA-010	MLA-010											Y									
		EPA 1668	MLA-010											Y									
	Sum - Pentachlorobiphenyls (BZ-90 + BZ-101 + BZ-113)	SGS AXYS MLA-010	MLA-010											Y									
		EPA 1668	MLA-010											Y									
	Sum - Pentachlorobiphenyls (BZ-93 + BZ-95 + BZ-98 + BZ-100 + BZ-102)	SGS AXYS MLA-010	MLA-010											Y									
		EPA 1668	MLA-010											Y									
	Sum - Tetrachlorobiphenyls (BZ-40 + BZ-41 + BZ-71)	SGS AXYS MLA-010	MLA-010											Y									
		EPA 1668	MLA-010											Y									
	Sum - Tetrachlorobiphenyls (BZ-44 + BZ-47 + BZ-65)	SGS AXYS MLA-010	MLA-010											Y									
		EPA 1668	MLA-010											Y									
	Sum - Tetrachlorobiphenyls (BZ-45 + BZ-51)	SGS AXYS MLA-010	MLA-010											Y									
		EPA 1668	MLA-010											Y									
	Sum - Tetrachlorobiphenyls (BZ-49 + BZ-69)	SGS AXYS MLA-010	MLA-010											Y									
		EPA 1668	MLA-010											Y									
	Sum - Tetrachlorobiphenyls (BZ-50 + BZ-53)	SGS AXYS MLA-010	MLA-010											Y									
		EPA 1668	MLA-010											Y									
	Sum - Tetrachlorobiphenyls (BZ-59 + BZ-62 + BZ-75)	SGS AXYS MLA-010	MLA-010											Y									
		EPA 1668	MLA-010											Y									
	Sum - Tetrachlorobiphenyls (BZ-61 + BZ-70 + BZ-74 + BZ-76)	SGS AXYS MLA-010	MLA-010											Y									
		EPA 1668	MLA-010											Y									
	Sum - Trichlorobiphenyls (BZ-18 + BZ-30)	SGS AXYS MLA-010	MLA-010											Y									
		EPA 1668	MLA-010											Y									
	Sum - Trichlorobiphenyls (BZ-20 + BZ-28)	SGS AXYS MLA-010	MLA-010											Y									
		EPA 1668	MLA-010											Y									
	Sum - Trichlorobiphenyls (BZ-21 + BZ-33)	SGS AXYS MLA-010	MLA-010											Y									
		EPA 1668	MLA-010											Y									
	Sum - Trichlorobiphenyls (BZ-26 + BZ-29)	SGS AXYS MLA-010	MLA-010											Y									
		EPA 1668	MLA-010											Y									
	Total Dichlorobiphenyls	SGS AXYS MLA-010	MLA-010											Y									
		EPA 1668	MLA-010											Y									
		EPA 8270	MLA-007										Y										
		SGS AXYS MLA-010	MLA-010	Y	Y								Y	Y		Y		Y		Y			Y
	Total Heptachlorobiphenyls	SGS AXYS MLA-007	MLA-007			Y								Y				Y		Y			
		EPA 1668	MLA-010											Y				Y					Y
		EPA 8270	MLA-007									Y											
		SGS AXYS MLA-010	MLA-010	Y	Y								Y	Y		Y		Y		Y			Y
	Total Hexachlorobiphenyls	SGS AXYS MLA-007	MLA-007			Y								Y				Y		Y			
		EPA 1668	MLA-010											Y				Y					Y
		EPA 8270	MLA-007									Y											
		SGS AXYS MLA-010	MLA-010	Y	Y								Y	Y		Y		Y		Y			Y
	Total Monochlorobiphenyls	SGS AXYS MLA-007	MLA-007			Y								Y				Y		Y			
		EPA 1668	MLA-010											Y				Y					Y

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **
1,2,3,7,8,9-HxCDF		EPA 1613	MLA-017									Y	Y								Y				Y	Y	Y	Y	Y	Y	Y	Y	Y	
		EPA 8290	MLA-017				Y		Y	Y	Y		Y	Y			Y	Y	Y	Y	Y				Y		Y					Y		
		SGS AXYS MLA-017	MLA-017	Y	Y	Y									Y		Y	Y			Y		Y		Y		Y	Y	Y	Y	Y		Y	
1,2,3,7,8-PeCDD		EPA 1613	MLA-017									Y	Y								Y				Y		Y	Y	Y	Y	Y	Y	Y	
		EPA 8290	MLA-017				Y		Y	Y	Y		Y	Y			Y	Y	Y	Y	Y				Y		Y	Y	Y	Y	Y	Y		
		SGS AXYS MLA-017	MLA-017	Y	Y	Y									Y		Y	Y			Y		Y		Y		Y	Y	Y	Y	Y	Y	Y	
1,2,3,7,8-PeCDF		EPA 1613	MLA-017									Y	Y								Y				Y		Y	Y	Y	Y	Y	Y	Y	
		EPA 8290	MLA-017				Y		Y	Y	Y		Y	Y			Y	Y	Y	Y	Y				Y		Y	Y	Y	Y	Y	Y		
		SGS AXYS MLA-017	MLA-017	Y	Y	Y									Y		Y	Y			Y		Y		Y		Y	Y	Y	Y	Y	Y	Y	
2,3,4,6,7,8-HxCDF		EPA 1613	MLA-017								Y	Y									Y				Y		Y	Y	Y	Y	Y	Y	Y	
		EPA 8290	MLA-017				Y		Y	Y	Y		Y	Y			Y	Y	Y	Y	Y				Y		Y	Y	Y	Y	Y	Y		
		SGS AXYS MLA-017	MLA-017	Y	Y	Y									Y		Y	Y			Y		Y		Y		Y	Y	Y	Y	Y	Y	Y	
2,3,4,7,8-PeCDF		EPA 1613	MLA-017								Y	Y									Y				Y		Y	Y	Y	Y	Y	Y	Y	
		EPA 8290	MLA-017				Y		Y	Y	Y		Y	Y			Y	Y	Y	Y	Y				Y		Y	Y	Y	Y	Y	Y		
		SGS AXYS MLA-017	MLA-017	Y	Y	Y									Y		Y	Y			Y		Y		Y		Y	Y	Y	Y	Y	Y	Y	
2,3,7,8-TCDD		EPA 1613	MLA-017								Y	Y									Y				Y		Y	Y	Y	Y	Y	Y	Y	
		EPA 8290	MLA-017				Y		Y	Y	Y		Y	Y			Y	Y	Y	Y	Y				Y		Y	Y	Y	Y	Y	Y		
		SGS AXYS MLA-017	MLA-017	Y	Y	Y									Y		Y	Y			Y		Y		Y		Y	Y	Y	Y	Y	Y	Y	
2,3,7,8-TCDF		EPA 1613	MLA-017								Y	Y									Y				Y		Y	Y	Y	Y	Y	Y	Y	
		EPA 8290	MLA-017				Y		Y	Y	Y		Y	Y			Y	Y	Y	Y	Y				Y		Y	Y	Y	Y	Y	Y		
		SGS AXYS MLA-017	MLA-017	Y	Y	Y									Y		Y	Y			Y		Y		Y		Y	Y	Y	Y	Y	Y	Y	
OCDD		EPA 1613	MLA-017								Y	Y									Y				Y		Y	Y	Y	Y	Y	Y	Y	
		EPA 8290	MLA-017				Y		Y	Y	Y		Y	Y			Y	Y	Y	Y	Y				Y		Y	Y	Y	Y	Y	Y		
		SGS AXYS MLA-017	MLA-017	Y	Y	Y									Y		Y	Y			Y		Y		Y		Y	Y	Y	Y	Y	Y	Y	
OCDF		EPA 1613	MLA-017								Y	Y									Y				Y		Y	Y	Y	Y	Y	Y	Y	
		EPA 8290	MLA-017				Y		Y	Y	Y		Y	Y			Y	Y	Y	Y	Y				Y		Y	Y	Y	Y	Y	Y		
		SGS AXYS MLA-017	MLA-017	Y	Y	Y									Y		Y	Y			Y		Y		Y		Y	Y	Y	Y	Y	Y	Y	
Total HpCDD		EPA 1613	MLA-017								Y										Y				Y						Y	Y	Y	
		EPA 8290	MLA-017				Y		Y		Y		Y	Y			Y	Y	Y	Y	Y				Y		Y				Y	Y		
		SGS AXYS MLA-017	MLA-017				Y								Y		Y				Y		Y		Y							Y	Y	
Total HpCDF		EPA 1613	MLA-017								Y										Y				Y						Y	Y	Y	
		EPA 8290	MLA-017				Y		Y		Y		Y	Y			Y	Y	Y	Y	Y				Y			Y				Y	Y	
		SGS AXYS MLA-017	MLA-017				Y								Y		Y				Y		Y		Y							Y	Y	
Total HxCDD		EPA 1613	MLA-017								Y										Y				Y						Y	Y	Y	
		EPA 8290	MLA-017				Y		Y		Y		Y	Y			Y	Y	Y	Y	Y				Y		Y					Y	Y	
		SGS AXYS MLA-017	MLA-017				Y								Y		Y				Y		Y		Y							Y	Y	
Total HxCDF		EPA 1613	MLA-017								Y										Y				Y						Y	Y	Y	
		EPA 8290	MLA-017				Y		Y		Y		Y	Y			Y	Y	Y	Y	Y				Y		Y					Y	Y	
		SGS AXYS MLA-017	MLA-017				Y								Y		Y				Y		Y		Y							Y	Y	
Total PCDD		EPA 1613	MLA-017								Y										Y											Y	Y	Y
		EPA 8290	MLA-017									Y									Y											Y	Y	
		SGS AXYS MLA-017	MLA-017									Y									Y												Y	Y
Total PCDD+PCDF		EPA 1613	MLA-017								Y										Y											Y	Y	Y
		EPA 8290	MLA-017									Y									Y											Y	Y	
		SGS AXYS MLA-017	MLA-017									Y									Y											Y	Y	
Total PCDF		EPA 1613	MLA-017								Y										Y											Y	Y	Y
		EPA 8290	MLA-017									Y									Y											Y	Y	
		SGS AXYS MLA-017	MLA-017									Y									Y											Y	Y	
Total PeCDD		EPA 1613	MLA-017								Y									Y					Y						Y	Y	Y	
		EPA 8290	MLA-017				Y		Y		Y		Y	Y			Y	Y	Y	Y	Y				Y		Y				Y	Y		

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum	Solids								Tissue				Urine	Water	Water, Non-Potable														
				CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025
	2-hydroxy-ibuprofen	SGS AXYS MLA-075	MLA-075		Y																	Y											
	4-Epianhydrochlortetracycline (EACTC)	EPA 1694	MLA-075									Y																				Y	
		SGS AXYS MLA-075	MLA-075		Y																	Y											
	4-Epianhydrotetracycline (EATC)	EPA 1694	MLA-075									Y																				Y	
		SGS AXYS MLA-075	MLA-075		Y																	Y											
	4-Epichlortetracycline (ECTC)	EPA 1694	MLA-075									Y																				Y	
		SGS AXYS MLA-075	MLA-075		Y																	Y											
	4-Epioxytetracycline (EOTC)	EPA 1694	MLA-075									Y																				Y	
		SGS AXYS MLA-075	MLA-075		Y																	Y											
	4-Epitetracycline (ETC)	EPA 1694	MLA-075									Y																				Y	
		SGS AXYS MLA-075	MLA-075		Y																	Y											
	Acetaminophen	EPA 1694	MLA-075									Y																				Y	
		SGS AXYS MLA-075	MLA-075		Y																	Y											
	Albuterol	EPA 1694	MLA-075									Y																				Y	
		SGS AXYS MLA-075	MLA-075		Y																	Y											
	Alprazolam	SGS AXYS MLA-075	MLA-075		Y																	Y											
	Amitriptyline	SGS AXYS MLA-075	MLA-075		Y																	Y											
	Amlodipine	SGS AXYS MLA-075	MLA-075		Y																	Y											
	Amphetamine	SGS AXYS MLA-075	MLA-075		Y																	Y											
	Anhydrochlortetracycline (ACTC)	EPA 1694	MLA-075									Y																				Y	
		SGS AXYS MLA-075	MLA-075		Y																	Y											
	Anhydrotetracycline (ATC)	EPA 1694	MLA-075									Y																				Y	
		SGS AXYS MLA-075	MLA-075		Y																	Y											
	Atenolol	SGS AXYS MLA-075	MLA-075		Y																	Y											
	Atorvastatin	SGS AXYS MLA-075	MLA-075		Y																	Y											
	Azithromycin	EPA 1694	MLA-075									Y																				Y	
		SGS AXYS MLA-075	MLA-075		Y																	Y											
	Benzoyllecgonine	SGS AXYS MLA-075	MLA-075		Y																	Y											
	Benztropine	SGS AXYS MLA-075	MLA-075		Y																	Y											
	Betamethasone	SGS AXYS MLA-075	MLA-075		Y																	Y											
	Bisphenol A	EPA 1694	MLA-075									Y																				Y	
		SGS AXYS MLA-075	MLA-075		Y																	Y											
	Caffeine	EPA 1694	MLA-075									Y																				Y	
		SGS AXYS MLA-075	MLA-075		Y																	Y											
	Carbadox	EPA 1694	MLA-075									Y																				Y	
		SGS AXYS MLA-075	MLA-075		Y																	Y											
	Carbamazepine	EPA 1694	MLA-075									Y																				Y	
		SGS AXYS MLA-075	MLA-075		Y																	Y											
	Cefotaxime	EPA 1694	MLA-075									Y																				Y	
		SGS AXYS MLA-075	MLA-075		Y																	Y											
	Chlortetracycline (CTC)	EPA 1694	MLA-075									Y																				Y	
		SGS AXYS MLA-075	MLA-075		Y																	Y											
	Cimetidine	EPA 1694	MLA-075									Y																				Y	
		SGS AXYS MLA-075	MLA-075		Y																	Y											
	Ciprofloxacin	EPA 1694	MLA-075									Y																				Y	
		SGS AXYS MLA-075	MLA-075		Y																	Y											
	Clarithromycin	EPA 1694	MLA-075									Y																				Y	
		SGS AXYS MLA-075	MLA-075		Y																	Y											
	Clinafloxacin	EPA 1694	MLA-075									Y																				Y	
		SGS AXYS MLA-075	MLA-075		Y																	Y											

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **
	Clonidine	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Cloxacillin	EPA 1694	MLA-075									Y																			Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Cocaine	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Codeine	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Cotinine	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	DEET (N,N-diethyl-m-toluamide)	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Dehydronifedipine	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Demeclocycline	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Desmethyldiltiazem	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Diazepam	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Digoxigenin	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Digoxin	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Diltiazem	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Diphenhydramine	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Doxycycline	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Enalapril	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Enrofloxacin	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Erythromycin	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Erythromycin anhydrate	EPA 1694	MLA-075										Y																		Y			
	Flumequine	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Fluocinonide	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Fluoxetine	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Fluticasone propionate	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Furosemide	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Gemfibrozil	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Glipizide	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Glyburide	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Hydrochlorothiazide	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Hydrocodone	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Hydrocortisone	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Ibuprofen	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y								Y										Y											
	Isochlortetracycline (ICTC)	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Lincomycin	EPA 1694	MLA-075										Y																		Y			

Accreditation Scope

SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 40

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **
		SGS AXYS MLA-075	MLA-075		Y								Y										Y											
	Lomefloxacin	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Meprobamate	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Metformin	EPA 1694	MLA-075										Y																	Y				
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Methylprednisolone	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Metoprolol	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Miconazole	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Minocycline	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Naproxen	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Norfloxacin	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Norfluoxetine	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Norgestimate	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Norverapamil	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Ofloxacin	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Ormetoprim	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Oxacillin	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Oxolinic acid	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Oxycodone	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Oxytetracycline (OTC)	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Paroxetine	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Penicillin G	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
Penicillin V	EPA 1694	MLA-075										Y																		Y				
	SGS AXYS MLA-075	MLA-075		Y																		Y												
Prednisolone	SGS AXYS MLA-075	MLA-075		Y																		Y												
Prednisone	SGS AXYS MLA-075	MLA-075		Y																		Y												
Promethazine	SGS AXYS MLA-075	MLA-075		Y																		Y												
Propoxyphene	SGS AXYS MLA-075	MLA-075		Y																		Y												
Propranolol	SGS AXYS MLA-075	MLA-075		Y																		Y												
Ranitidine	EPA 1694	MLA-075										Y																		Y				
	SGS AXYS MLA-075	MLA-075		Y																		Y												
Roxithromycin	EPA 1694	MLA-075										Y																		Y				
	SGS AXYS MLA-075	MLA-075		Y																		Y												
Sarafloxacin	EPA 1694	MLA-075										Y																		Y				
	SGS AXYS MLA-075	MLA-075		Y																		Y												
Sertraline	SGS AXYS MLA-075	MLA-075		Y																		Y												
Simvastatin	SGS AXYS MLA-075	MLA-075		Y																		Y												
Sulfachloropyridazine	EPA 1694	MLA-075										Y																		Y				
	SGS AXYS MLA-075	MLA-075		Y																		Y												
Sulfadiazine	EPA 1694	MLA-075										Y																		Y				
	SGS AXYS MLA-075	MLA-075		Y																		Y												
Sulfadimethoxine	EPA 1694	MLA-075										Y																		Y				
	SGS AXYS MLA-075	MLA-075		Y																		Y												

Accreditation Scope																																		
SGS AXYS Analytical Services Ltd. file ref.: ACC-101 Rev. 40																																		
				Serum	Solids										Tissue					Urine	Water	Water, Non-Potable												
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **
	Sulfamerazine	EPA 1694	MLA-075										Y																	Y				
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Sulfamethazine	EPA 1694	MLA-075										Y																	Y				
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Sulfamethizole	EPA 1694	MLA-075										Y																	Y				
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Sulfamethoxazole	EPA 1694	MLA-075										Y																	Y				
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Sulfanilamide	EPA 1694	MLA-075										Y																	Y				
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Sulfathiazole	EPA 1694	MLA-075										Y																	Y				
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Tetracycline (TC)	EPA 1694	MLA-075										Y																	Y				
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Theophylline	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Thiabendazole	EPA 1694	MLA-075										Y																	Y				
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Trenbolone	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Trenbolone acetate	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Triamterene	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Triclocarban	EPA 1694	MLA-075										Y																	Y				
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Triclosan	EPA 1694	MLA-075										Y																	Y				
		SGS AXYS MLA-075	MLA-075		Y																		Y											
Trimethoprim	EPA 1694	MLA-075										Y																	Y					
	SGS AXYS MLA-075	MLA-075		Y																		Y												
Tylosin	EPA 1694	MLA-075										Y																	Y					
	SGS AXYS MLA-075	MLA-075		Y																		Y												
Valsartan	SGS AXYS MLA-075	MLA-075		Y																		Y												
Verapamil	SGS AXYS MLA-075	MLA-075		Y																		Y												
Virginiamycin	EPA 1694	MLA-075										Y																	Y					
	SGS AXYS MLA-075	MLA-075		Y																		Y												
Warfarin	EPA 1694	MLA-075										Y																	Y					
	SGS AXYS MLA-075	MLA-075		Y																		Y												
Targeted Metabolites	11, 14, 17-eicosatrienoic acid (eicosatrienoic acid)	SGS AXYS MLM-001	MLM-001											Y																				
	11, 14-eicosadienoic acid	SGS AXYS MLM-001	MLM-001											Y																				
	3-hydroxytyrosine	SGS AXYS MLM-001	MLM-001		Y									Y								Y												
	Acetylcarnitine	SGS AXYS MLM-001	MLM-001		Y									Y								Y												
	Acetylmethionine	SGS AXYS MLM-001	MLM-001		Y									Y								Y												
	Alanine	SGS AXYS MLM-001	MLM-001		Y									Y								Y												
	alpha-Aminoadipic acid	SGS AXYS MLM-001	MLM-001		Y									Y								Y												
	Arginine	SGS AXYS MLM-001	MLM-001		Y									Y								Y												
	Asparagine	SGS AXYS MLM-001	MLM-001		Y									Y								Y												
	Aspartate	SGS AXYS MLM-001	MLM-001		Y									Y								Y												
	Asymmetric dimethylarginine	SGS AXYS MLM-001	MLM-001		Y									Y								Y												
	Butenylcarnitine	SGS AXYS MLM-001	MLM-001		Y									Y								Y												
	Butyrylcarnitine	SGS AXYS MLM-001	MLM-001		Y									Y								Y												
	C22:5 ISOMER 1 (tentatively all-cis-4, 8, 12, 15, 19-docosapentaenoic acid)	SGS AXYS MLM-001	MLM-001											Y																				
	C22:5 ISOMER 2 (all-cis-7,10,13,16,19-docosapentaenoic acid (DPA)	SGS AXYS MLM-001	MLM-001											Y																				
	C22:5 ISOMER 3 (tentatively all-cis-4, 7, 10, 13, 16-docosapentaenoic acid)	SGS AXYS MLM-001	MLM-001											Y																				
	Carnitine	SGS AXYS MLM-001	MLM-001		Y									Y								Y												
	Carnosine	SGS AXYS MLM-001	MLM-001		Y									Y								Y												
	chenodeoxycholic acid	SGS AXYS MLM-001	MLM-001		Y									Y								Y												
	cholic acid	SGS AXYS MLM-001	MLM-001		Y									Y								Y												
	Citrulline	SGS AXYS MLM-001	MLM-001		Y									Y								Y												
	Creatinine	SGS AXYS MLM-001	MLM-001		Y									Y								Y												
	Decadienylcarnitine	SGS AXYS MLM-001	MLM-001		Y									Y								Y												
	decanoic acid (capric acid)	SGS AXYS MLM-001	MLM-001											Y																				

Accreditation Scope																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						

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Accreditation Scope				Serum		Solids		Tissue		Urine	Water	Water, Non-Potable	
SGS AXYS Analytical Services Ltd. file ref.: ACC-101 Rev. 40													
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB ISO 17025
	Taurine	SGS AXYS MLM-001	MLM-001	Y									
	taurochenodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y									
	taurocholic acid	SGS AXYS MLM-001	MLM-001	Y									
	taurodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y									
	tauroolithocholic acid	SGS AXYS MLM-001	MLM-001	Y									
	taurooursodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y									
	Tetradecadienylcarnitine	SGS AXYS MLM-001	MLM-001	Y									
	tetradecanoic acid (myristic acid)	SGS AXYS MLM-001	MLM-001										
	Tetradecanoylcarnitine	SGS AXYS MLM-001	MLM-001	Y									
	Tetradecenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y									
	Threonine	SGS AXYS MLM-001	MLM-001	Y									
	Tiglylcarnitine	SGS AXYS MLM-001	MLM-001	Y									
	Total dimethylarginine	SGS AXYS MLM-001	MLM-001	Y									
	Tryptophan	SGS AXYS MLM-001	MLM-001	Y									
	Tyrosine	SGS AXYS MLM-001	MLM-001	Y									
	ursodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y									
	Valerylcarnitine	SGS AXYS MLM-001	MLM-001	Y									
	Valine	SGS AXYS MLM-001	MLM-001	Y									
TBBPA	Tetrabromobisphenol A	SGS AXYS MLA-079	MLA-079	Y									
TOP	Perfluorobutanesulfonate (PFBS)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorobutanoate (PFBA)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorodecanesulfonate (PFDS)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorodecanoate (PFDA)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorododecanesulfonate (PFDoS)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorododecanoate (PFDoA)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluoroheptanesulfonate (PFHpS)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluoroheptanoate (PFHpA)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorohexanesulfonate (PFHxS)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorohexanoate (PFHxA)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorononanesulfonate (PFNS)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorononanoate (PFNA)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorooctanesulfonate (PFOS)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorooctanoate (PFOA)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluoropentanesulfonate (PFPeS)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluoropentanoate (PFPeA)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorotetradecanoate (PFTeDA)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorotridecanoate (PFTTrDA)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluoroundecanoate (PFUnA)	SGS AXYS MLA-111	MLA-111		Y								
Note *	Analysis of pesticides and PCBs in non-potable water samples by AXYS method MLA-007, with the exception of NPDES or State permitted discharges and Stormwater applications, may fall within the scope of Washington State Department of Ecology solids matrix accreditation, subject to approval of the Ecology Project Manager.												
Note **	PFAS by LC-MS/MS compliant with US DoD QSM 5.1 table B-15												

Legend

Y	Accreditation scope
BFR	Brominated flame retardants (non-PBDPE)
BPA and mPE	Bisphenol A and mono-Phthalate Esters
HBCDD	Hexabromocyclododecane
OC Pesticides	Organochlorine Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PBDPE	Polybrominated diphenylethers
PCB	Polychlorinated Biphenyls
PCDDF	Polychlorinated dibenzodioxins/furans
PFAS	Per- and Polyfluoroalkyl Substances
PPCP	Pharmaceutical and Personal Care Products
TBBPA	Tetrabromobisphenol A
TOP	Total Oxidizable Precursors
California DPH	California Department of Public Health, Lab ID 2911
Florida DOH	Florida Department of Health, Lab ID E871007, (NELAC Standard)
Pennsylvania DEP	Pennsylvania Department of Environmental Protection
Minnesota DOH	Minnesota Department of Health, Lab ID 232-999-430, (NELAC Standard)
New Jersey DEP	New Jersey Department of Environmental Protection, Lab ID CANA005, (NELAC Standard)
New York DOH	New York Department of Health, Lab ID 11674, (NELAC Standard)
Washington DE	Washington Department of Ecology, Lab ID C404
Virginia DGS	Virginia Department of General Services, Division of Consolidated Laboratory Services, Lab ID 460224, (NELAC Standard)
Maine DOH	Maine Center for Disease Control and Prevention, Department of Health and Human Services, Lab ID CN00003

ANAB DoD ANSI-ASQ National Accreditation Board, certificate ADE-1861, (US DoD QSM 5.1 Standard)



CALA Canadian Association for Laboratory Accreditation Inc., Lab ID A2637, (ISO/IEC 17025:2005 Standard)



ANAB ISO 17025 ANSI-ASQ National Accreditation Board, certificate ADE-1861.01, (ISO/IEC 17025:2005 Standard)





2045 Mills Road West

TEL: (250) 655-5800

Sidney, BC, Canada V8L5X2

TOLL-FREE: 1-888-373-0881

SGS AXYS Client No.: 4986

Client Address: CDM Smith
14432 SE Eastgate Way # 100
Bellevue, WA, US, 98007

The SGS AXYS contact for these data is Georgina Brooks.

BATCH SUMMARY

Batch ID: WG65251	Date: 26-Sep-2018
Analysis Type: Perfluorinated Organic and FTS	Matrix Type: Solid
BATCH MAKEUP	
Contract: 4986 Samples: L29920-1 FP1-4.5 L29920-2 FP1-16 L29920-4 FP1-10	Blank: WG65251-101 Reference or Spike: WG65251-102 Duplicate:
Comments: 1. Data are considered final. 2. Data are not blank corrected. PFNA was detected in the Lab Blank. Blank data should be taken into consideration when evaluating sample data. 3. Blank data should be evaluated against specifications using the same blank sample size as the size of the client samples. 4. For all the client and QC samples, percent recoveries of some labeled surrogates did not meet the method specifications and are flagged with a 'V'. As the isotope dilution method of quantification produces data that are recovery corrected, the slight variances from the method acceptance criteria are deemed not to affect the quantification of these analytes. Percent labeled compound recoveries are used as a general method performance indicator only.	

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February 2017

FQA-006 Rev. 4. 20-Sep-2013

CHAIN OF CUSTODY

2045 Mills Road West TEL: (250) 655-5800 TOLL FREE 1-888-373-0881
 Sidney, British Columbia, Canada V8L 5X2 FAX: (250) 655-5811

SGS AXYS CLIENT #: 4986

REPORT TO:			INVOICE TO:			ANALYSIS REQUESTED				
Company <u>CDM SMITH</u>			Company <u>SAME</u>			<u>PFAS/PFOs</u>	<u>HOLD</u>			
Address <u>14432 SE EASTGATE WY. STE. 100</u>			Address							
<u>BELLEVUE, WA 98007</u>										
Contact <u>PAM MORRILL</u>			Contact							
Phone <u>425-519-8300</u>			Phone							
FAX			FAX							
E-mail <u>morrillpj@cdmsmith.com</u>			E-mail							
Project Name/Number:			Sampler's Name:							
Signature:										
Client Sample Identification	Matrix	Sampling Date	Sampling Time	Container Type/No.	SGS AXYS Lab Sample ID (Lab use only)					
RINSE-1	W/GC	8-15-18	0910	POLY/3	L29886-2	X				
FP3-GW	GW	↓	1345	POLY/3	-4					
RINSE-2	W/GC		1550	POLY/3	-3					
FPI-4.5	S		1625	JAR/1	L29920-1					
FPI-16	S		1630	JAR/1	-2					
FPI-17.5	S		1635	JAR/1	-3					
FPI-10	S		1710	POLY/1	-4					
FP2-GW	GW		1725	POLY/3	L29886-5	X				
FPI-GW	GW		1755	POLY/3	-6	X				
Trip Blank	GW				POLY/1	L29886-1	X			
Relinquished by (Signature) <u>Pam Morrill</u> Date <u>8/20/18</u> Time <u>1200</u>			Received by (Signature) <u>[Signature]</u> Date <u>21-Aug-2018</u> Time <u>11:45</u>			Courier		Waybill No.		
Relinquished by (Signature)			Received by (Signature)			Sample Receipt				
Date			Time							
Remarks						Cooler				
						Temp °C				
						Custody Seal #				
						Seal Intact Y / N				
						Sample Tags Y / N				

SGS AXYS METHOD MLA-110 Rev 01

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.

FP1-4.5

Sample Collection:

15-Aug-2018 16:25

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986

Project No.

FIRE PIT PHASE II PO# 84012

Lab Sample I.D.:

L29920-1

Matrix: SOLID

Sample Size: 0.949 g (dry)

Sample Receipt Date: 21-Aug-2018

Initial Calibration Date: 30-Aug-2018

Extraction Date: 17-Sep-2018

Instrument ID: LC MS/MS

Analysis Date: 18-Sep-2018 Time: 19:10:43

Column ID: C18

Extract Volume (uL): 4000

Sample Data Filename: FC8W_282 S: 22

Injection Volume (uL): 3

Blank Data Filename: FC8W_282 S: 14

Dilution Factor: N/A

Cal. Ver. Data Filename: FC8W_282 S: 9

Concentration Units: ng/g (dry weight basis)

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.864 (L)	
PFPeA	U		0.432 (L)	
PFHxA		1.87	0.216 (L)	4:57
PFHpA		0.477	0.216 (L)	5:34
PFOA		5.07	0.216 (L)	6:29
PFNA		38.2	0.211 (L)	7:11
PFDA		1.83	0.211 (L)	7:36
PFUnA		5.63	0.211 (L)	7:57
PFDaA	U		0.211 (L)	
PFTTrDA		2.09	0.211 (L)	8:49
PFTeDA	U		0.211 (L)	
PFBS		0.631	0.216 (L)	4:56
PFPeS		1.36	0.200 (L)	5:39
PFHxS		19.2	0.216 (L)	6:38
PFHpS		2.06	0.200 (L)	7:18
PFOS	E			
PFNS		2.09	0.200 (L)	7:56
PFDS	U		0.216 (L)	
PFDoS	U		0.200 (L)	
4:2 FTS	U		0.843 (L)	
6:2 FTS	U		0.759 (L)	
8:2 FTS		1.06	0.843 (L)	7:27
PFOSA		0.872	0.216 (L)	8:31
N-MeFOSA	U		0.242 (L)	
N-EtFOSA	U		0.527 (L)	
MeFOSAA	U		0.211 (L)	
EtFOSAA	U		0.211 (L)	
N-MeFOSE	U		2.15 (L)	
N-EtFOSE	U		1.61 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; E = exceeds calibrated linear range, see dilution data.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Henry Huang _____

SGS AXYS METHOD MLA-110 Rev 01

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
FP1-4.5
Sample Collection:
15-Aug-2018 16:25

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986

Project No.

FIRE PIT PHASE II PO# 84012

Lab Sample I.D.:

L29920-1

Matrix: SOLID

Sample Size: 0.949 g (dry)

Sample Receipt Date: 21-Aug-2018

Initial Calibration Date: 30-Aug-2018

Extraction Date: 17-Sep-2018

Instrument ID: LC MS/MS

Analysis Date: 18-Sep-2018 **Time:** 19:10:43

Column ID: C18

Extract Volume (uL): 4000

Sample Data Filename: FC8W_282 S: 22

Injection Volume (uL): 3

Blank Data Filename: FC8W_282 S: 14

Dilution Factor: N/A

Cal. Ver. Data Filename: FC8W_282 S: 9

Concentration Units: ng absolute

This page is part of a total report that contains information necessary for accreditation compliance.
 Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELLED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	36.5	91.4	2:18
13C5-PFPeA		20.0	21.2	106	4:23
13C5-PFHxA		10.0	10.1	101	4:57
13C4-PFHpA		10.0	9.07	90.7	5:34
13C8-PFOA		10.0	8.55	85.5	6:29
13C9-PFNA		5.00	4.25	85.0	7:11
13C6-PFDA		5.00	3.86	77.2	7:36
13C7-PFUnA	V	5.00	2.49	49.8	7:57
13C2-PFDoA	V	5.00	1.60	31.9	8:22
13C2-PFTeDA		5.00	1.01	20.2	9:17
13C3-PFBS		10.0	9.70	97.0	4:56
13C3-PFHxS		10.0	9.66	96.6	6:38
13C8-PFOS		10.0	8.97	89.7	7:43
13C2-4:2 FTS	V	20.0	32.2	161	4:48
13C2-6:2 FTS		20.0	20.0	100	6:09
13C2-8:2 FTS		20.0	19.7	98.6	7:27
13C8-PFOSA		10.0	7.04	70.4	8:31
D3-N-MeFOSA		10.0	3.83	38.3	9:51
D5-N-EtFOSA		10.0	3.23	32.3	10:07
D3-MeFOSAA		20.0	16.9	84.3	7:37
D5-EtFOSAA		20.0	14.7	73.7	7:46
d7-NMe-FOSE		100	53.1	53.1	9:43
d9-NEt-FOSE		100	44.1	44.1	9:59

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Henry Huang _____

For Axs Internal Use Only [XSL Template: FC-Form2.xsl; Created: 26-Sep-2018 12:14:26; Application: XMLTransformer-1.16.50;
 Report Filename: PFC_FC_LC_PFAS_L29920-1_Form2_FC8W_282S22_SJ2435248.html; Workgroup: WG65251; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.

FP1-4.5

Sample Collection:

15-Aug-2018 16:25

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986

Project No.

FIRE PIT PHASE II PO# 84012

Lab Sample I.D.:

L29920-1 N

Matrix: SOLID

Sample Size: 0.949 g (dry)

Sample Receipt Date: 21-Aug-2018

Initial Calibration Date: 30-Aug-2018

Extraction Date: 17-Sep-2018

Instrument ID: LC MS/MS

Analysis Date: 21-Sep-2018 Time: 20:20:28

Column ID: C18

Extract Volume (uL): 4000

Sample Data Filename: FC8W_287 S: 31

Injection Volume (uL): 3

Blank Data Filename: FC8W_282 S: 14

Dilution Factor: 5

Cal. Ver. Data Filename: FC8W_287 S: 9

Concentration Units: ng/g (dry weight basis)

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	X			
PFPeA	X			
PFHxA	X			
PFHpA	X			
PFOA	X			
PFNA	X			
PFDA	X			
PFUnA	X			
PFDoA	X			
PFTTrDA	X			
PFTeDA	X			
PFBS	X			
PFPeS	X			
PFHxS	X			
PFHpS	X			
PFOS	D	716	1.08 (L)	7:43
PFNS	X			
PFDS	X			
PFDoS	X			
4:2 FTS	X			
6:2 FTS	X			
8:2 FTS	X			
PFOSA	X			
N-MeFOSA	X			
N-EtFOSA	X			
MeFOSAA	X			
EtFOSAA	X			
N-MeFOSE	X			
N-EtFOSE	X			

(1) Where applicable, custom lab flags have been used on this report; D = dilution data; X = result reported separately.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Henry Huang _____

SGS AXYS METHOD MLA-110 Rev 01

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
FP1-4.5
Sample Collection:
15-Aug-2018 16:25

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986

Project No.

FIRE PIT PHASE II PO# 84012

Lab Sample I.D.:

L29920-1 N

Matrix: SOLID

Sample Size: 0.949 g (dry)

Sample Receipt Date: 21-Aug-2018

Initial Calibration Date: 30-Aug-2018

Extraction Date: 17-Sep-2018

Instrument ID: LC MS/MS

Analysis Date: 21-Sep-2018 Time: 20:20:28

Column ID: C18

Extract Volume (uL): 4000

Sample Data Filename: FC8W_287 S: 31

Injection Volume (uL): 3

Blank Data Filename: FC8W_282 S: 14

Dilution Factor: 5

Cal. Ver. Data Filename: FC8W_287 S: 9

Concentration Units: ng absolute

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELLED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA	X				
13C5-PFPeA	X				
13C5-PFHxA	X				
13C4-PFHpA	X				
13C8-PFOA	X				
13C9-PFNA	X				
13C6-PFDA	X				
13C7-PFUnA	X				
13C2-PFDoA	X				
13C2-PFTeDA	X				
13C3-PFBS	X				
13C3-PFHxS	X				
13C8-PFOS	D	10.0	8.64	86.4	7:43
13C2-4:2 FTS	X				
13C2-6:2 FTS	X				
13C2-8:2 FTS	X				
13C8-PFOSA	X				
D3-N-MeFOSA	X				
D5-N-EtFOSA	X				
D3-MeFOSAA	X				
D5-EtFOSAA	X				
d7-NMe-FOSE	X				
d9-NET-FOSE	X				

(1) Where applicable, custom lab flags have been used on this report; D = dilution data; X = result reported separately.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Henry Huang _____

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Report Filename: PFC_FC_LC_PFAS_L29920-1_Form2_FC8W_287S31_SJ2436434.html; Workgroup: WG65251; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.

FP1-16

Sample Collection:

15-Aug-2018 16:30

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986

Project No.

FIRE PIT PHASE II PO# 84012

Lab Sample I.D.:

L29920-2

Matrix: SOLID

Sample Size: 0.878 g (dry)

Sample Receipt Date: 21-Aug-2018

Initial Calibration Date: 30-Aug-2018

Extraction Date: 17-Sep-2018

Instrument ID: LC MS/MS

Analysis Date: 18-Sep-2018 Time: 19:24:11

Column ID: C18

Extract Volume (uL): 4000

Sample Data Filename: FC8W_282 S: 23

Injection Volume (uL): 3

Blank Data Filename: FC8W_282 S: 14

Dilution Factor: N/A

Cal. Ver. Data Filename: FC8W_282 S: 9

Concentration Units: ng/g (dry weight basis)

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.934 (L)	
PFPeA	U		0.467 (L)	
PFHxA		1.45	0.234 (L)	4:57
PFHpA	U		0.234 (L)	
PFOA		1.85	0.234 (L)	6:30
PFNA		15.2	0.228 (L)	7:12
PFDA		0.982	0.228 (L)	7:37
PFUnA		14.7	0.228 (L)	7:58
PFDaA		0.991	0.228 (L)	8:22
PFTTrDA		24.1	0.228 (L)	8:49
PFTeDA		0.433	0.228 (L)	9:17
PFBS		0.271	0.234 (L)	4:57
PFPeS		0.677	0.216 (L)	5:39
PFHxS		9.69	0.234 (L)	6:38
PFHpS		1.38	0.216 (L)	7:19
PFOS		645	0.234 (L)	7:44
PFNS		1.64	0.216 (L)	7:57
PFDS		0.331	0.234 (L)	8:33
PFDoS	U		0.216 (L)	
4:2 FTS	U		0.911 (L)	
6:2 FTS		1.26	0.820 (L)	6:09
8:2 FTS		6.64	0.911 (L)	7:27
PFOSA		8.38	0.234 (L)	8:31
N-MeFOSA	U		0.262 (L)	
N-EtFOSA	U		0.570 (L)	
MeFOSAA	U		0.228 (L)	
EtFOSAA	U		0.228 (L)	
N-MeFOSE	U		2.32 (L)	
N-EtFOSE	U		1.74 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Henry Huang _____

SGS AXYS METHOD MLA-110 Rev 01

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
FP1-16
Sample Collection:
15-Aug-2018 16:30

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986

Project No.

FIRE PIT PHASE II PO# 84012

Lab Sample I.D.:

L29920-2

Matrix: SOLID

Sample Size: 0.878 g (dry)

Sample Receipt Date: 21-Aug-2018

Initial Calibration Date: 30-Aug-2018

Extraction Date: 17-Sep-2018

Instrument ID: LC MS/MS

Analysis Date: 18-Sep-2018 **Time:** 19:24:11

Column ID: C18

Extract Volume (uL): 4000

Sample Data Filename: FC8W_282 S: 23

Injection Volume (uL): 3

Blank Data Filename: FC8W_282 S: 14

Dilution Factor: N/A

Cal. Ver. Data Filename: FC8W_282 S: 9

Concentration Units: ng absolute

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELLED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	37.4	93.6	2:18
13C5-PFPeA		20.0	22.4	112	4:24
13C5-PFHxA		10.0	11.0	110	4:57
13C4-PFHpA		10.0	9.09	90.9	5:35
13C8-PFOA		10.0	8.28	82.8	6:30
13C9-PFNA		5.00	3.99	79.8	7:11
13C6-PFDA		5.00	3.76	75.1	7:37
13C7-PFUnA	V	5.00	2.34	46.8	7:58
13C2-PFDoA	V	5.00	1.47	29.4	8:22
13C2-PFTeDA		5.00	1.01	20.2	9:17
13C3-PFBS		10.0	10.6	106	4:56
13C3-PFHxS		10.0	10.2	102	6:38
13C8-PFOS		10.0	7.94	79.4	7:43
13C2-4:2 FTS	V	20.0	36.8	184	4:49
13C2-6:2 FTS		20.0	22.8	114	6:09
13C2-8:2 FTS		20.0	18.1	90.5	7:27
13C8-PFOSA		10.0	6.31	63.1	8:31
D3-N-MeFOSA		10.0	4.04	40.4	9:51
D5-N-EtFOSA		10.0	3.27	32.7	10:07
D3-MeFOSAA		20.0	16.4	81.9	7:38
D5-EtFOSAA		20.0	12.0	60.0	7:46
d7-NMe-FOSE		100	41.1	41.1	9:43
d9-NEt-FOSE		100	37.7	37.7	9:59

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Henry Huang _____

For Axs Internal Use Only [XSL Template: FC-Form2.xsl; Created: 26-Sep-2018 12:14:26; Application: XMLTransformer-1.16.50;
Report Filename: PFC_FC_LC_PFAS_L29920-2_Form2_FC8W_282S23_SJ2435249.html; Workgroup: WG65251; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.

FP1-10

Sample Collection:

15-Aug-2018 17:10

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986

Project No.

FIRE PIT PHASE II PO# 84012

Lab Sample I.D.:

L29920-4

Matrix: SOLID

Sample Size: 0.949 g (dry)

Sample Receipt Date: 21-Aug-2018

Initial Calibration Date: 30-Aug-2018

Extraction Date: 17-Sep-2018

Instrument ID: LC MS/MS

Analysis Date: 18-Sep-2018 Time: 19:37:40

Column ID: C18

Extract Volume (uL): 4000

Sample Data Filename: FC8W_282 S: 24

Injection Volume (uL): 3

Blank Data Filename: FC8W_282 S: 14

Dilution Factor: N/A

Cal. Ver. Data Filename: FC8W_282 S: 9

Concentration Units: ng/g (dry weight basis)

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.864 (L)	
PFPeA	U		0.432 (L)	
PFHxA		1.45	0.216 (L)	4:57
PFHpA	U		0.216 (L)	
PFOA		1.52	0.216 (L)	6:29
PFNA		6.90	0.211 (L)	7:11
PFDA		0.296	0.211 (L)	7:36
PFUnA		3.42	0.211 (L)	7:58
PFDaA		0.304	0.211 (L)	8:23
PFTTrDA		10.3	0.211 (L)	8:50
PFTeDA		0.235	0.211 (L)	9:17
PFBS		0.562	0.216 (L)	4:56
PFPeS		0.821	0.200 (L)	5:39
PFHxS		10.9	0.216 (L)	6:38
PFHpS		0.815	0.200 (L)	7:18
PFOS		165	0.216 (L)	7:43
PFNS		0.491	0.200 (L)	7:56
PFDS	U		0.216 (L)	
PFDoS	U		0.200 (L)	
4:2 FTS	U		0.843 (L)	
6:2 FTS	U		0.759 (L)	
8:2 FTS	U		0.843 (L)	
PFOSA		2.76	0.216 (L)	8:31
N-MeFOSA	U		0.242 (L)	
N-EtFOSA	U		0.527 (L)	
MeFOSAA	U		0.211 (L)	
EtFOSAA	U		0.211 (L)	
N-MeFOSE	U		2.15 (L)	
N-EtFOSE	U		1.61 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Henry Huang _____

SGS AXYS METHOD MLA-110 Rev 01

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
FP1-10
Sample Collection:
15-Aug-2018 17:10

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986

Project No.

FIRE PIT PHASE II PO# 84012

Lab Sample I.D.:

L29920-4

Matrix: SOLID

Sample Size: 0.949 g (dry)

Sample Receipt Date: 21-Aug-2018

Initial Calibration Date: 30-Aug-2018

Extraction Date: 17-Sep-2018

Instrument ID: LC MS/MS

Analysis Date: 18-Sep-2018 Time: 19:37:40

Column ID: C18

Extract Volume (uL): 4000

Sample Data Filename: FC8W_282 S: 24

Injection Volume (uL): 3

Blank Data Filename: FC8W_282 S: 14

Dilution Factor: N/A

Cal. Ver. Data Filename: FC8W_282 S: 9

Concentration Units: ng absolute

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELLED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	36.8	91.9	2:19
13C5-PFPeA		20.0	20.6	103	4:23
13C5-PFHxA		10.0	9.84	98.4	4:57
13C4-PFHpA		10.0	9.48	94.8	5:34
13C8-PFOA		10.0	8.97	89.7	6:29
13C9-PFNA		5.00	4.30	86.0	7:11
13C6-PFDA		5.00	3.85	77.0	7:36
13C7-PFUnA		5.00	2.71	54.2	7:58
13C2-PFDoA	V	5.00	1.63	32.5	8:22
13C2-PFTeDA		5.00	0.934	18.7	9:17
13C3-PFBS		10.0	9.38	93.8	4:56
13C3-PFHxS		10.0	9.14	91.4	6:38
13C8-PFOS		10.0	9.38	93.8	7:43
13C2-4:2 FTS	V	20.0	31.4	157	4:48
13C2-6:2 FTS		20.0	19.4	96.8	6:09
13C2-8:2 FTS		20.0	18.5	92.5	7:27
13C8-PFOSA		10.0	6.79	67.9	8:31
D3-N-MeFOSA		10.0	4.12	41.2	9:51
D5-N-EtFOSA		10.0	4.03	40.3	10:07
D3-MeFOSAA		20.0	17.4	87.0	7:37
D5-EtFOSAA		20.0	15.1	75.6	7:46
d7-NMe-FOSE		100	42.2	42.2	9:43
d9-NEt-FOSE		100	39.1	39.1	10:00

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Henry Huang _____

For Axs Internal Use Only [XSL Template: FC-Form2.xsl; Created: 26-Sep-2018 12:14:26; Application: XMLTransformer-1.16.50;
Report Filename: PFC_FC_LC_PFAS_L29920-4_Form2_FC8W_282S24_SJ2435250.html; Workgroup: WG65251; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 1A

PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.

Lab Blank

Sample Collection:

N/A

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986

Project No.

N/A

Lab Sample I.D.:

WG65251-101

Matrix: AQUEOUS (SOLID METHOD)

Sample Size: 1.00 g

Sample Receipt Date: N/A

Initial Calibration Date: 30-Aug-2018

Extraction Date: 17-Sep-2018

Instrument ID: LC MS/MS

Analysis Date: 18-Sep-2018 Time: 17:22:58

Column ID: C18

Extract Volume (uL): 4000

Sample Data Filename: FC8W_282 S: 14

Injection Volume (uL): 3

Blank Data Filename: FC8W_282 S: 14

Dilution Factor: N/A

Cal. Ver. Data Filename: FC8W_282 S: 9

Concentration Units: ng/g

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RETENTION TIME
PFBA	U		0.820 (L)	
PFPeA	U		0.410 (L)	
PFHxA	U		0.205 (L)	
PFHpA	U		0.205 (L)	
PFOA	U		0.205 (L)	
PFNA		0.616	0.200 (L)	7:12
PFDA	U		0.200 (L)	
PFUnA	U		0.305 (S)	
PFDoA	U		0.200 (L)	
PFTTrDA	U		0.200 (L)	
PFTeDA	U		0.200 (L)	
PFBS	U		0.205 (L)	
PFPeS	U		0.190 (L)	
PFHxS	U		0.205 (L)	
PFHpS	U		0.190 (L)	
PFOS	U		0.205 (L)	
PFNS	U		0.190 (L)	
PFDS	U		0.205 (L)	
PFDoS	U		0.190 (L)	
4:2 FTS	U		0.800 (L)	
6:2 FTS	U		0.720 (L)	
8:2 FTS	U		0.800 (L)	
PFOSA	U		0.205 (L)	
N-MeFOSA	U		0.230 (L)	
N-EtFOSA	U		0.500 (L)	
MeFOSAA	U		0.200 (L)	
EtFOSAA	U		0.200 (L)	
N-MeFOSE	U		2.04 (L)	
N-EtFOSE	U		1.53 (L)	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Henry Huang _____

SGS AXYS METHOD MLA-110 Rev 01

Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
Lab Blank
Sample Collection:
N/A

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4986

Project No.

N/A

Lab Sample I.D.:

WG65251-101

Matrix: AQUEOUS (SOLID METHOD)

Sample Size: 1.00 g

Sample Receipt Date: N/A

Initial Calibration Date: 30-Aug-2018

Extraction Date: 17-Sep-2018

Instrument ID: LC MS/MS

Analysis Date: 18-Sep-2018 Time: 17:22:58

Column ID: C18

Extract Volume (uL): 4000

Sample Data Filename: FC8W_282 S: 14

Injection Volume (uL): 3

Blank Data Filename: FC8W_282 S: 14

Dilution Factor: N/A

Cal. Ver. Data Filename: FC8W_282 S: 9

Concentration Units: ng absolute

This page is part of a total report that contains information necessary for accreditation compliance.
Results are compliant with NELAP accreditation described in the total report. Sample results relate only to the sample tested.

LABELLED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		40.0	38.9	97.3	2:20
13C5-PFPeA		20.0	21.2	106	4:24
13C5-PFHxA		10.0	10.1	101	4:57
13C4-PFHpA		10.0	9.87	98.7	5:35
13C8-PFOA		10.0	9.13	91.3	6:30
13C9-PFNA		5.00	3.91	78.2	7:12
13C6-PFDA		5.00	2.91	58.2	7:37
13C7-PFUnA	V	5.00	1.85	37.1	7:58
13C2-PFDoA	V	5.00	1.16	23.3	8:23
13C2-PFTeDA		5.00	0.839	16.8	9:17
13C3-PFBS		10.0	9.11	91.1	4:57
13C3-PFHxS		10.0	8.91	89.1	6:39
13C8-PFOS		10.0	7.27	72.7	7:44
13C2-4:2 FTS	V	20.0	30.2	151	4:49
13C2-6:2 FTS		20.0	17.1	85.3	6:09
13C2-8:2 FTS		20.0	10.4	52.0	7:27
13C8-PFOSA		10.0	5.16	51.6	8:31
D3-N-MeFOSA	V	10.0	1.90	19.0	9:51
D5-N-EtFOSA	V	10.0	1.72	17.2	10:07
D3-MeFOSAA		20.0	12.1	60.4	7:38
D5-EtFOSAA	V	20.0	8.96	44.8	7:46
d7-NMe-FOSE		100	31.3	31.3	9:43
d9-NET-FOSE		100	26.0	26.0	10:00

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Henry Huang _____

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Report Filename: PFC_FC_LC_PFAS_WG65251-101_Form2_FC8W_282S14_SJ2435239.html; Workgroup: WG65251; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 8A

PERFLUORINATED ORGANICS ONGOING PRECISION AND RECOVERY (OPR)

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4986	Lab Sample I.D.:	WG65251-102
Matrix:	SOLID	Initial Calibration Date:	30-Aug-2018
Extraction Date:	17-Sep-2018	Instrument ID:	LC MS/MS
Analysis Date:	18-Sep-2018 Time: 16:56:02	Column ID:	C18
Extract Volume (uL):	4000	OPR Data Filename:	FC8W_282 S: 12
Injection Volume (uL):	3	Blank Data Filename:	FC8W_282 S: 14
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC8W_282 S: 9

ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT, BASED ON A 1 mL EXTRACT VOLUME.

COMPOUND	LAB FLAG ¹	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	% RECOVERY	RETENTION TIME
PFBA		39.7	40.6	102	2:20
PFPeA		19.9	20.0	101	4:24
PFHxA		9.94	10.2	102	4:57
PFHpA		9.95	10.1	101	5:35
PFOA		9.95	11.1	112	6:30
PFNA		9.98	11.1	112	7:12
PFDA		9.94	10.4	104	7:37
PFUnA		9.97	10.9	110	7:58
PFDoA		10.0	10.9	109	8:23
PFTTrDA		10.1	11.6	115	8:50
PFTeDA		9.95	10.9	109	9:18
PFBS		9.86	10.8	109	4:57
PFPeS		9.38	9.91	106	5:40
PFHxS		9.98	10.7	107	6:39
PFHpS		9.52	11.6	121	7:19
PFOS		9.92	10.6	107	7:44
PFNS		9.60	7.14	74.4	8:08
PFDS		9.90	4.22	42.6	8:35
PFDoS		9.68	3.76	38.8	9:29
4:2 FTS		40.1	43.1	108	4:49
6:2 FTS		36.1	38.1	106	6:09
8:2 FTS		40.0	47.5	119	7:28
PFOSA		9.93	11.1	112	8:32
N-MeFOSA		11.5	13.1	114	9:51
N-EtFOSA		25.0	24.9	99.7	10:08
MeFOSAA		10.0	10.8	108	7:38
EtFOSAA		10.0	9.65	96.5	7:47
N-MeFOSE		99.0	111	112	9:45
N-EtFOSE		74.2	82.8	111	10:01

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Henry Huang _____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

SGS AXYS METHOD MLA-110 Rev 01

Form 8B

PERFLUORINATED ORGANICS ONGOING PRECISION AND RECOVERY (OPR)

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4986	Lab Sample I.D.:	WG65251-102
Matrix:	SOLID	Initial Calibration Date:	30-Aug-2018
Extraction Date:	17-Sep-2018	Instrument ID:	LC MS/MS
Analysis Date:	18-Sep-2018 Time: 16:56:02	Column ID:	C18
Extract Volume (uL):	4000	OPR Data Filename:	FC8W_282 S: 12
Injection Volume (uL):	3	Blank Data Filename:	FC8W_282 S: 14
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC8W_282 S: 9

ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT, BASED ON A 1 mL EXTRACT VOLUME.

LABELLED COMPOUND	LAB FLAG ¹	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	% RECOVERY	RETENTION TIME
13C4-PFBA		40.0	38.5	96.1	2:20
13C5-PFPeA		20.0	20.5	102	4:24
13C5-PFHxA		10.0	9.84	98.4	4:57
13C4-PFHpA		10.0	9.47	94.7	5:35
13C8-PFOA		10.0	8.37	83.7	6:30
13C9-PFNA		5.00	4.06	81.2	7:12
13C6-PFDA		5.00	3.40	68.0	7:37
13C7-PFUnA	V	5.00	2.01	40.2	7:58
13C2-PFDoA	V	5.00	1.24	24.9	8:23
13C2-PFTeDA	V	5.00	1.32	26.5	9:17
13C3-PFBS		10.0	9.96	99.6	4:57
13C3-PFHxS		10.0	9.23	92.3	6:39
13C8-PFOS		10.0	6.85	68.5	7:44
13C2-4:2 FTS		20.0	27.5	138	4:49
13C2-6:2 FTS		20.0	16.6	82.9	6:09
13C2-8:2 FTS		20.0	12.0	60.0	7:27
13C8-PFOSA	V	10.0	4.91	49.1	8:32
D3-N-MeFOSA	V	10.0	1.89	18.9	9:51
D5-N-EtFOSA	V	10.0	1.70	17.0	10:08
D3-MeFOSAA		20.0	11.5	57.6	7:38
D5-EtFOSAA	V	20.0	7.52	37.6	7:46
d7-NMe-FOSE		100	28.8	28.8	9:44
d9-NEt-FOSE		100	26.5	26.5	10:00

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Henry Huang _____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

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SGS AXYS METHOD MLA-110 Rev 01

Form 3A
LC MS/MS INITIAL CALIBRATION PERCENT RECOVERIES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Initial Calibration Date: 30-Aug-2018

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A

CS1 Data Filename: FC8W_251 S: 14

CS2 Data Filename: FC8W_251 S: 15

CS3 Data Filename: FC8W_251 S: 16

CS4 Data Filename: FC8W_251 S: 17

CS5 Data Filename: FC8W_251 S: 18

CS6 Data Filename: FC8W_251 S: 19

CS7 Data Filename: FC8W_251 S: 20

CS8 Data Filename: FC8W_251 S: 21

COMPOUND	LAB FLAG ¹	PERCENT RECOVERY (%)								
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8
PFBA			98.8	100	97.3	102	101	101	99.2	100
PFPeA			95.0	97.0	96.7	103	107	102	100	99.7
PFHxA			83.8	99.7	99.9	110	110	97.2	100	100
PFHpA			98.2	101	95.9	103	99.8	102	102	99.5
PFOA			90.0	108	103	104	94.2	104	97.6	100
PFNA			94.9	101	99.9	102	104	100	98.5	100
PFDA			89.5	90.8	99.8	104	109	104	104	98.7
PFUnA			96.5	117	109	99.2	86.5	97.3	93.3	102
PFDaA			93.7	97.1	99.1	106	101	104	99.2	
PFTTrDA			89.4	101	98.5	103	107	103	99.2	
PFTeDA			82.4	107	93.5	108	109	101	99.5	
PFBS			82.6	99.9	113	108	99.4	99.7	96.6	101
PFPeS			97.0	106	98.9	92.1	103	104	99.2	
PFHxS			80.7	97.5	102	102	114	104	99.3	99.9
PFHpS			87.2	107	92.5	104	100	108	102	99.1
PFOS			83.2	113	105	105	98.7	97.6	96.8	101
PFNS			101	108	95.3	90.5	103	101	102	99.5
PFDS			102	99.9	105	89.9	105	97.9	99.3	100
PFDoS			87.1	100	111	97.6	104	99.3	101	99.7
4:2 FTS			88.1	95.1	104	93.7	110	112	97.2	
6:2 FTS			83.5	109	107	101	98.6	100		
8:2 FTS			90.8	111	99.5	96.9	102	99.7		
PFOSA			84.2	88.1	113	111	102	100	102	99.4
N-MeFOSA			92.4	85.0	106	113	99.2	106	98.8	
N-EtFOSA			80.6	111	107	108	95.2	101	97.2	101
MeFOSAA			80.1	109	87.7	127	102	98.8	94.1	101
EtFOSAA			90.6	124	98.9	97.3	92.8	103	91.5	102
N-MeFOSE			97.0	95.6	103	103	101	100	99.6	100
N-EtFOSE			92.9	98.3	103	101	102	104	99.1	100

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Kristina Coleman _____

SGS AXYS METHOD MLA-110 Rev 01

Form 3B

LC MS/MS INITIAL CALIBRATION PERCENT RECOVERIES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 30-Aug-2018

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A

CS1 Data Filename: FC8W_251 S: 14

CS2 Data Filename: FC8W_251 S: 15

CS3 Data Filename: FC8W_251 S: 16

CS4 Data Filename: FC8W_251 S: 17

CS5 Data Filename: FC8W_251 S: 18

CS6 Data Filename: FC8W_251 S: 19

CS7 Data Filename: FC8W_251 S: 20

CS8 Data Filename: FC8W_251 S: 21

LABELED COMPOUND	LAB FLAG ¹	PERCENT RECOVERIES (%)								
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8
13C4-PFBA			102	98.9	101	100	101	98.9	100	97.2
13C5-PFPeA			103	104	108	103	103	97.8	100	81.9
13C5-PFHxA			101	103	106	101	103	102	99.6	83.2
13C4-PFHpA			99.4	103	103	104	103	101	96.1	91.0
13C8-PFOA			102	103	103	103	105	98.5	99.4	85.7
13C9-PFNA			105	103	103	98.1	95.3	98.7	98.1	99.1
13C6-PFDA			119	108	118	101	106	102	89.2	57.0
13C7-PFUnA			113	106	119	97.3	105	103	96.8	60.0
13C2-PFDoA			115	106	114	93.5	112	96.8	93.0	68.8
13C2-PFTeDA			114	97.2	116	96.0	113	98.1	91.9	73.5
13C3-PFBS			107	98.8	104	101	113	111	93.9	70.9
13C3-PFHxS			102	101	107	100	102	101	94.0	92.4
13C8-PFOS			105	98.1	97.4	96.8	101	100	95.3	106
13C2-4:2 FTS			119	111	120	112	113	100	70.1	54.7
13C2-6:2 FTS			108	101	111	104	117	102	85.5	72.3
13C2-8:2 FTS			111	110	115	106	111	97.4	73.1	77.8
13C8-PFOSA			98.8	99.2	92.5	92.4	100	99.5	97.3	120
D3-N-MeFOSA			92.6	98.6	88.7	88.7	97.8	96.0	98.4	139
D5-N-EtFOSA			93.9	101	94.2	95.2	104	97.5	96.2	118
D3-MeFOSAA			92.3	104	101	97.0	103	111	100	91.6
D5-EtFOSAA			104	100	106	99.7	104	98.8	93.4	93.8
d7-NMe-FOSE			102	99.9	97.1	93.5	105	97.5	93.9	111
d9-NEt-FOSE			101	100	95.9	93.2	106	94.9	95.9	113

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Kristina Coleman _____

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Report Filename: PFOA_FC_LC_30-Aug-2018_FC8W__Form3B_GS77746.html; Workgroup: WG65251; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 3C
LC MS/MS INITIAL CALIBRATION RETENTION TIMES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 30-Aug-2018

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A

CS1 Data Filename: FC8W_251 S: 14

CS2 Data Filename: FC8W_251 S: 15

CS3 Data Filename: FC8W_251 S: 16

CS4 Data Filename: FC8W_251 S: 17

CS5 Data Filename: FC8W_251 S: 18

CS6 Data Filename: FC8W_251 S: 19

CS7 Data Filename: FC8W_251 S: 20

CS8 Data Filename: FC8W_251 S: 21

COMPOUND	LAB FLAG ¹	RETENTION TIMES								MEAN RT
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8
PFBA			2:25	2:24	2:25	2:24	2:25	2:25	2:24	2:24
PFPeA			4:27	4:27	4:27	4:27	4:27	4:27	4:27	4:27
PFHxA			5:00	5:00	5:00	5:00	5:00	5:00	5:00	5:00
PFHpA			5:39	5:39	5:39	5:39	5:39	5:39	5:39	5:39
PFOA			6:35	6:35	6:35	6:35	6:35	6:35	6:35	6:35
PFNA			7:14	7:15	7:15	7:15	7:15	7:15	7:14	7:15
PFDA			7:38	7:39	7:39	7:39	7:39	7:39	7:39	7:39
PFUnA			8:00	8:01	8:01	8:01	8:01	8:01	8:00	8:01
PFDoA			8:26	8:26	8:26	8:26	8:26	8:26	8:26	8:26
PFTTrDA			8:55	8:54	8:54	8:54	8:54	8:55	8:54	8:54
PFTeDA			9:22	9:22	9:22	9:22	9:22	9:22	9:22	9:22
PFBS			4:59	5:00	4:59	4:59	4:59	4:59	4:59	4:59
PFPeS			5:44	5:44	5:44	5:45	5:44	5:44	5:44	5:44
PFHxS			6:44	6:44	6:44	6:44	6:44	6:44	6:44	6:44
PFHpS			7:22	7:22	7:22	7:22	7:22	7:22	7:22	7:22
PFOS			7:46	7:46	7:46	7:46	7:46	7:46	7:46	7:46
PFNS			8:10	8:10	8:11	8:10	8:10	8:11	8:10	8:10
PFDS			8:38	8:38	8:38	8:38	8:38	8:38	8:38	8:38
PFDoS			9:33	9:33	9:32	9:32	9:32	9:33	9:32	9:32
4:2 FTS			4:50	4:51	4:51	4:51	4:51	4:51	4:51	4:51
6:2 FTS			6:14	6:15	6:15	6:14	6:14	6:14		6:14
8:2 FTS			7:29	7:29	7:29	7:30	7:30	7:29		7:29
PFOSA			8:32	8:32	8:32	8:32	8:32	8:32	8:32	8:32
N-MeFOSA			9:51	9:50	9:50	9:50	9:50	9:51	9:50	9:50
N-EtFOSA			10:10	10:09	10:09	10:09	10:09	10:10	10:09	10:09
MeFOSAA			7:40	7:40	7:40	7:41	7:40	7:40	7:40	7:40
EtFOSAA			7:48	7:49	7:49	7:49	7:49	7:49	7:48	7:49
N-MeFOSE			9:43	9:42	9:42	9:43	9:43	9:43	9:42	9:43
N-EtFOSE			10:02	10:02	10:02	10:02	10:02	10:02	10:01	10:02

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: Kristina Coleman

SGS AXYS METHOD MLA-110 Rev 01

Form 3D
LC MS/MS INITIAL CALIBRATION RETENTION TIMES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 30-Aug-2018

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A

CS1 Data Filename: FC8W_251 S: 14

CS2 Data Filename: FC8W_251 S: 15

CS3 Data Filename: FC8W_251 S: 16

CS4 Data Filename: FC8W_251 S: 17

CS5 Data Filename: FC8W_251 S: 18

CS6 Data Filename: FC8W_251 S: 19

CS7 Data Filename: FC8W_251 S: 20

CS8 Data Filename: FC8W_251 S: 21

LABELED COMPOUND	LAB FLAG ¹	RETENTION TIMES								MEAN RT	
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7		CS8
13C4-PFBA			2:24	2:24	2:24	2:24	2:24	2:24	2:24	2:24	2:24
13C5-PFPeA			4:27	4:27	4:27	4:27	4:27	4:27	4:27	4:27	4:27
13C5-PFHxA			4:59	5:00	5:00	5:00	5:00	4:59	4:59	5:00	5:00
13C4-PFHpA			5:39	5:39	5:39	5:39	5:39	5:39	5:39	5:39	5:39
13C8-PFOA			6:35	6:35	6:35	6:35	6:35	6:35	6:35	6:35	6:35
13C9-PFNA			7:14	7:15	7:14	7:15	7:15	7:15	7:14	7:14	7:15
13C6-PFDA			7:38	7:39	7:39	7:39	7:39	7:39	7:38	7:38	7:39
13C7-PFUnA			8:00	8:01	8:01	8:01	8:01	8:01	8:00	8:00	8:01
13C2-PFDoA			8:26	8:26	8:26	8:26	8:26	8:26	8:26	8:26	8:26
13C2-PFTeDA			9:22	9:22	9:22	9:22	9:22	9:22	9:22	9:22	9:22
13C3-PFBS			4:59	4:59	4:59	4:59	4:59	4:59	4:59	4:59	4:59
13C3-PFHxS			6:44	6:44	6:44	6:44	6:44	6:44	6:44	6:44	6:44
13C8-PFOS			7:46	7:46	7:46	7:46	7:46	7:46	7:46	7:46	7:46
13C2-4:2 FTS			4:50	4:51	4:51	4:51	4:51	4:51	4:51	4:51	4:51
13C2-6:2 FTS			6:14	6:15	6:15	6:14	6:14	6:14	6:14	6:14	6:14
13C2-8:2 FTS			7:29	7:29	7:29	7:30	7:30	7:30	7:29	7:29	7:29
13C8-PFOSA			8:32	8:32	8:32	8:32	8:32	8:32	8:32	8:32	8:32
D3-N-MeFOSA			9:50	9:50	9:50	9:50	9:50	9:50	9:50	9:50	9:50
D5-N-EtFOSA			10:09	10:09	10:09	10:09	10:09	10:09	10:08	10:09	10:09
D3-MeFOSAA			7:40	7:40	7:40	7:40	7:40	7:40	7:40	7:40	7:40
D5-EtFOSAA			7:48	7:48	7:48	7:49	7:49	7:49	7:48	7:48	7:48
d7-NMe-FOSE			9:41	9:41	9:41	9:41	9:41	9:42	9:41	9:41	9:41
d9-NEt-FOSE			10:00	10:00	10:00	10:00	10:00	10:01	10:00	10:00	10:00

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Kristina Coleman _____

For Axy Internal Use Only [XSL Template: FC-Form3D.xsl; Created: 26-Sep-2018 12:14:26; Application: XMLTransformer-1.16.50;
Report Filename: PFOA_FC_LC_30-Aug-2018_FC8W__Form3D_GS77746.html; Workgroup: WG65251; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 4A
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 30-Aug-2018

VER Data Filename: FC8W_282 S: 9

Instrument ID: LC MS/MS

Analysis Date: 18-Sep-2018

LC Column ID: C18

Analysis Time: 16:15:38

COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
PFBA		2:21	41.0	41.2	100
PFPeA		4:24	20.4	20.1	98.6
PFHxA		4:58	10.3	9.88	96.4
PFHpA		5:36	10.3	10.1	98.7
PFOA		6:31	10.3	10.1	98.8
PFNA		7:12	10.0	9.97	99.7
PFDA		7:37	10.0	9.91	99.1
PFUnA		7:59	10.0	10.1	101
PFDoA		8:23	10.0	9.92	99.2
PFTTrDA		8:50	10.0	11.0	110
PFTeDA		9:18	10.0	10.7	107
PFBS		4:57	10.3	10.1	98.7
PFPeS		5:41	9.50	9.25	97.3
PFHxS		6:40	10.3	10.7	104
PFHpS		7:20	9.50	9.82	103
PFOS		7:45	10.3	10.6	104
PFNS		8:08	9.50	10.0	106
PFDS		8:34	10.3	10.1	98.7
PFDoS		9:29	9.50	8.88	93.5
4:2 FTS		4:49	40.0	43.7	109
6:2 FTS		6:10	36.0	37.8	105
8:2 FTS		7:28	40.0	39.2	98.0
PFOSA		8:32	10.3	10.1	98.8
N-MeFOSA		9:51	11.5	11.5	100
N-EtFOSA		10:08	25.0	25.3	101
MeFOSAA		7:39	10.0	9.97	99.7
EtFOSAA		7:47	10.0	9.32	93.2
N-MeFOSE		9:45	102	107	105
N-EtFOSE		10:01	76.5	82.0	107

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Henry Huang _____

For Axys Internal Use Only [XSL Template: FC-Form4A.xsl; Created: 26-Sep-2018 12:14:26; Application: XMLTransformer-1.16.50;
Report Filename: PFOA_FC_LC_FC8W_282S9__Form4A_SJ2435233.html; Workgroup: WG65251; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 4B
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 30-Aug-2018

VER Data Filename: FC8W_282 S: 9

Instrument ID: LC MS/MS

Analysis Date: 18-Sep-2018

LC Column ID: C18

Analysis Time: 16:15:38

LABELLED COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
13C4-PFBA		2:21	40.0	39.6	98.9
13C5-PFPeA		4:24	20.0	21.5	107
13C5-PFHxA		4:58	10.0	10.7	107
13C4-PFHpA		5:36	10.0	10.9	109
13C8-PFOA		6:31	10.0	10.6	106
13C9-PFNA		7:12	5.00	5.01	100
13C6-PFDA		7:37	5.00	5.47	109
13C7-PFUnA		7:59	5.00	5.50	110
13C2-PFDoA		8:23	5.00	5.07	101
13C2-PFTeDA		9:17	5.00	4.46	89.3
13C3-PFBS		4:57	9.30	9.57	103
13C3-PFHxS		6:40	9.30	9.36	101
13C8-PFOS		7:45	9.30	8.75	94.1
13C2-4:2 FTS		4:49	20.0	14.4	71.9
13C2-6:2 FTS		6:10	20.0	13.6	67.9
13C2-8:2 FTS		7:28	20.0	12.4	62.1
13C8-PFOSA		8:32	10.0	9.98	99.8
D3-N-MeFOSA		9:51	10.0	9.08	90.8
D5-N-EtFOSA		10:08	10.0	10.1	101
D3-MeFOSAA		7:39	20.0	14.2	71.2
D5-EtFOSAA		7:47	20.0	14.5	72.3
d7-NMe-FOSE		9:44	100	91.8	91.8
d9-NEt-FOSE		10:00	100	95.1	95.1

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Henry Huang _____

For Axs Internal Use Only [XSL Template: FC-Form4B.xsl; Created: 26-Sep-2018 12:14:26; Application: XMLTransformer-1.16.50;
Report Filename: PFOA_FC_LC_FC8W_282S9__Form4B_SJ2435233.html; Workgroup: WG65251; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 4A
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 30-Aug-2018

VER Data Filename: FC8W_282 S: 27

Instrument ID: LC MS/MS

Analysis Date: 18-Sep-2018

LC Column ID: C18

Analysis Time: 20:18:03

COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
PFBA		2:20	41.0	41.7	102
PFPeA		4:24	20.4	20.8	102
PFHxA		4:57	10.3	10.0	98.0
PFHpA		5:35	10.3	10.2	99.4
PFOA		6:30	10.3	10.7	104
PFNA		7:11	10.0	10.4	104
PFDA		7:36	10.0	9.98	99.8
PFUnA		7:57	10.0	10.2	102
PFDoA		8:22	10.0	10.6	106
PFTTrDA		8:50	10.0	11.6	116
PFTeDA		9:17	10.0	10.3	103
PFBS		4:56	10.3	10.3	101
PFPeS		5:40	9.50	9.19	96.7
PFHxS		6:38	10.3	10.4	102
PFHpS		7:19	9.50	9.07	95.5
PFOS		7:43	10.3	9.91	96.7
PFNS		8:07	9.50	9.83	103
PFDS		8:34	10.3	9.48	92.5
PFDoS		9:28	9.50	8.09	85.1
4:2 FTS		4:49	40.0	43.5	109
6:2 FTS		6:09	36.0	36.7	102
8:2 FTS		7:27	40.0	47.0	118
PFOSA		8:31	10.3	10.2	100
N-MeFOSA		9:51	11.5	12.1	105
N-EtFOSA		10:08	25.0	24.8	99.4
MeFOSAA		7:37	10.0	10.8	108
EtFOSAA		7:46	10.0	9.59	95.9
N-MeFOSE		9:45	102	105	103
N-EtFOSE		10:01	76.5	78.9	103

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Henry Huang _____

For Axys Internal Use Only [XSL Template: FC-Form4A.xsl; Created: 26-Sep-2018 12:14:26; Application: XMLTransformer-1.16.50;
Report Filename: PFOA_FC_LC_FC8W_282S27__Form4A_SJ2435251.html; Workgroup: WG65251; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 4B
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 30-Aug-2018

VER Data Filename: FC8W_282 S: 27

Instrument ID: LC MS/MS

Analysis Date: 18-Sep-2018

LC Column ID: C18

Analysis Time: 20:18:03

LABELLED COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
13C4-PFBA		2:20	40.0	38.9	97.4
13C5-PFPeA		4:24	20.0	19.8	99.2
13C5-PFHxA		4:57	10.0	10.2	102
13C4-PFHpA		5:35	10.0	10.1	101
13C8-PFOA		6:29	10.0	9.39	93.9
13C9-PFNA		7:11	5.00	4.80	96.0
13C6-PFDA		7:36	5.00	5.35	107
13C7-PFUnA		7:57	5.00	5.32	106
13C2-PFDoA		8:22	5.00	5.04	101
13C2-PFTeDA		9:17	5.00	4.47	89.4
13C3-PFBS		4:56	9.30	9.06	97.5
13C3-PFHxS		6:38	9.30	9.22	99.2
13C8-PFOS		7:43	9.30	9.35	101
13C2-4:2 FTS		4:49	20.0	17.9	89.3
13C2-6:2 FTS		6:09	20.0	19.1	95.3
13C2-8:2 FTS		7:27	20.0	15.9	79.4
13C8-PFOSA		8:31	10.0	9.96	99.6
D3-N-MeFOSA		9:51	10.0	8.93	89.3
D5-N-EtFOSA		10:08	10.0	9.67	96.7
D3-MeFOSAA		7:37	20.0	19.1	95.6
D5-EtFOSAA		7:46	20.0	18.8	93.8
d7-NMe-FOSE		9:43	100	92.3	92.3
d9-NEt-FOSE		10:00	100	95.5	95.5

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Henry Huang _____

For Axs Internal Use Only [XSL Template: FC-Form4B.xsl; Created: 26-Sep-2018 12:14:26; Application: XMLTransformer-1.16.50;
Report Filename: PFOA_FC_LC_FC8W_282S27__Form4B_SJ2435251.html; Workgroup: WG65251; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 4A
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 30-Aug-2018

VER Data Filename: FC8W_287 S: 11

Instrument ID: LC MS/MS

Analysis Date: 21-Sep-2018

LC Column ID: C18

Analysis Time: 15:41:44

COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
PFBA		2:21	41.0	41.6	101
PFPeA		4:27	20.4	20.5	100
PFHxA		5:04	10.3	11.0	107
PFHpA		5:41	10.3	10.3	100
PFOA		6:36	10.3	10.1	98.7
PFNA		7:15	10.0	10.3	103
PFDA		7:37	10.0	9.78	97.8
PFUnA		7:56	10.0	10.4	104
PFDaA		8:19	10.0	11.0	110
PFTTrDA		8:47	10.0	11.0	110
PFTeDA		9:14	10.0	10.6	106
PFBS		5:03	10.3	10.5	102
PFPeS		5:46	9.50	9.60	101
PFHxS		6:44	10.3	10.6	103
PFHpS		7:22	9.50	9.34	98.3
PFOS		7:44	10.3	10.7	105
PFNS		8:04	9.50	10.4	109
PFDS		8:30	10.3	10.2	99.1
PFDoS		9:26	9.50	9.11	95.9
4:2 FTS		4:56	40.0	42.3	106
6:2 FTS		6:15	36.0	34.9	97.0
8:2 FTS		7:29	40.0	42.8	107
PFOSA		8:34	10.3	10.4	102
N-MeFOSA		9:49	11.5	11.7	102
N-EtFOSA		10:07	25.0	24.8	99.4
MeFOSAA		7:39	10.0	10.8	108
EtFOSAA		7:46	10.0	10.5	105
N-MeFOSE		9:42	102	103	101
N-EtFOSE		9:59	76.5	80.2	105

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Henry Huang _____

For Axys Internal Use Only [XSL Template: FC-Form4A.xsl; Created: 26-Sep-2018 12:14:26; Application: XMLTransformer-1.16.50;
Report Filename: PFOA_FC_LC_FC8W_287S11__Form4A_SJ2436432.html; Workgroup: WG65251; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 4B
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 30-Aug-2018

VER Data Filename: FC8W_287 S: 11

Instrument ID: LC MS/MS

Analysis Date: 21-Sep-2018

LC Column ID: C18

Analysis Time: 15:41:44

LABELED COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
13C4-PFBA		2:21	40.0	39.2	98.0
13C5-PFPeA		4:27	20.0	22.1	111
13C5-PFHxA		5:04	10.0	10.8	108
13C4-PFHpA		5:41	10.0	10.7	107
13C8-PFOA		6:36	10.0	10.6	106
13C9-PFNA		7:15	5.00	4.85	97.0
13C6-PFDA		7:37	5.00	5.53	111
13C7-PFUnA		7:56	5.00	5.22	104
13C2-PFDoA		8:20	5.00	4.93	98.5
13C2-PFTeDA		9:14	5.00	4.99	99.8
13C3-PFBS		5:03	9.30	8.74	94.0
13C3-PFHxS		6:44	9.30	8.18	88.0
13C8-PFOS		7:43	9.30	9.61	103
13C2-4:2 FTS		4:56	20.0	15.1	75.6
13C2-6:2 FTS		6:15	20.0	14.6	72.9
13C2-8:2 FTS		7:29	20.0	15.6	77.8
13C8-PFOSA		8:34	10.0	10.8	108
D3-N-MeFOSA		9:49	10.0	11.1	111
D5-N-EtFOSA		10:06	10.0	11.4	114
D3-MeFOSAA		7:39	20.0	21.7	109
D5-EtFOSAA		7:46	20.0	20.1	101
d7-NMe-FOSE		9:41	100	95.1	95.1
d9-NEt-FOSE		9:58	100	97.3	97.3

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Henry Huang _____

For Axs Internal Use Only [XSL Template: FC-Form4B.xsl; Created: 26-Sep-2018 12:14:26; Application: XMLTransformer-1.16.50;
Report Filename: PFOA_FC_LC_FC8W_287S11__Form4B_SJ2436432.html; Workgroup: WG65251; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 4A
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 30-Aug-2018

VER Data Filename: FC8W_287 S: 32

Instrument ID: LC MS/MS

Analysis Date: 21-Sep-2018

LC Column ID: C18

Analysis Time: 20:33:57

COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
PFBA		2:18	41.0	42.2	103
PFPeA		4:25	20.4	19.5	95.5
PFHxA		5:02	10.3	10.8	105
PFHpA		5:39	10.3	10.4	101
PFOA		6:34	10.3	10.1	98.4
PFNA		7:14	10.0	9.83	98.3
PFDA		7:37	10.0	9.92	99.2
PFUnA		7:55	10.0	9.20	92.0
PFDoA		8:18	10.0	10.1	101
PFTTrDA		8:44	10.0	9.97	99.7
PFTeDA		9:12	10.0	10.6	106
PFBS		5:01	10.3	9.69	94.5
PFPeS		5:43	9.50	9.08	95.6
PFHxS		6:43	10.3	9.65	94.1
PFHpS		7:22	9.50	8.92	93.9
PFOS		7:44	10.3	9.41	91.8
PFNS		8:03	9.50	9.01	94.9
PFDS		8:28	10.3	9.67	94.3
PFDoS		9:24	9.50	8.16	85.9
4:2 FTS		4:54	40.0	44.1	110
6:2 FTS		6:11	36.0	38.5	107
8:2 FTS		7:29	40.0	41.2	103
PFOSA		8:28	10.3	10.6	103
N-MeFOSA		9:48	11.5	11.3	98.2
N-EtFOSA		10:06	25.0	24.6	98.2
MeFOSAA		7:39	10.0	10.6	106
EtFOSAA		7:46	10.0	9.70	97.0
N-MeFOSE		9:41	102	110	107
N-EtFOSE		9:59	76.5	78.7	103

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Henry Huang _____

For Axys Internal Use Only [XSL Template: FC-Form4A.xsl; Created: 26-Sep-2018 12:14:26; Application: XMLTransformer-1.16.50;
Report Filename: PFOA_FC_LC_FC8W_287S32__Form4A_SJ2436435.html; Workgroup: WG65251; Design ID: 3321]

SGS AXYS METHOD MLA-110 Rev 01

Form 4B
LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
 V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 30-Aug-2018

VER Data Filename: FC8W_287 S: 32

Instrument ID: LC MS/MS

Analysis Date: 21-Sep-2018

LC Column ID: C18

Analysis Time: 20:33:57

LABELLED COMPOUND	LAB FLAG ¹	RETENTION TIME	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
13C4-PFBA		2:18	40.0	37.6	94.0
13C5-PFPeA		4:25	20.0	22.1	111
13C5-PFHxA		5:02	10.0	10.3	103
13C4-PFHpA		5:39	10.0	9.27	92.7
13C8-PFOA		6:33	10.0	9.42	94.2
13C9-PFNA		7:15	5.00	5.04	101
13C6-PFDA		7:37	5.00	5.47	109
13C7-PFUnA		7:55	5.00	5.58	112
13C2-PFDoA		8:17	5.00	5.17	103
13C2-PFTeDA		9:12	5.00	5.37	107
13C3-PFBS		5:01	9.30	10.3	111
13C3-PFHxS		6:43	9.30	10.0	108
13C8-PFOS		7:44	9.30	9.72	104
13C2-4:2 FTS		4:54	20.0	20.7	103
13C2-6:2 FTS		6:11	20.0	17.6	88.1
13C2-8:2 FTS		7:29	20.0	19.8	98.8
13C8-PFOSA		8:28	10.0	10.9	109
D3-N-MeFOSA		9:48	10.0	12.9	129
D5-N-EtFOSA		10:06	10.0	13.9	139
D3-MeFOSAA		7:39	20.0	22.6	113
D5-EtFOSAA		7:46	20.0	23.8	119
d7-NMe-FOSE		9:40	100	137	137
d9-NEt-FOSE		9:58	100	161	161

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Henry Huang _____

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 Report Filename: PFOA_FC_LC_FC8W_287S32__Form4B_SJ2436435.html; Workgroup: WG65251; Design ID: 3321]

Accreditation Scope																		Serum	Solids															Tissue															Urine	Water	Water, Non-Potable
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **																
BFR	BTBPE	SGS AXYS MLA-033	MLA-033		Y											Y							Y																												
	DBDPE	SGS AXYS MLA-033	MLA-033		Y											Y							Y																												
	HBB	SGS AXYS MLA-033	MLA-033		Y											Y							Y																												
	PBEB	SGS AXYS MLA-033	MLA-033		Y											Y							Y																												
Bisphenols	Bisphenol A	SGS AXYS MLA-113	MLA-113		Y																			Y																											
	Bisphenol AF	SGS AXYS MLA-113	MLA-113		Y																			Y																											
	Bisphenol B	SGS AXYS MLA-113	MLA-113		Y																			Y																											
	Bisphenol E	SGS AXYS MLA-113	MLA-113		Y																			Y																											
	Bisphenol F	SGS AXYS MLA-113	MLA-113		Y																			Y																											
	Bisphenol S	SGS AXYS MLA-113	MLA-113		Y																				Y																										
BPA and MPE	4,4'-dihydroxy-2,2-diphenylpropane (Bisphenol A) (BPA)	SGS AXYS MLA-059	MLA-059																				Y																												
	Mono-(2-ethyl-5-hydroxyhexyl) phthalate (MEHHP)	SGS AXYS MLA-059	MLA-059																					Y																											
	Mono-(2-ethyl-5-oxohexyl) phthalate (MEOHP)	SGS AXYS MLA-059	MLA-059																					Y																											
	Mono-(3-carboxypropyl) phthalate (MCPHP)	SGS AXYS MLA-059	MLA-059																					Y																											
	Mono-2-ethylhexyl phthalate (MEHP)	SGS AXYS MLA-059	MLA-059																					Y																											
	Mono-benzyl phthalate (MBzP)	SGS AXYS MLA-059	MLA-059																					Y																											
	Mono-butyl phthalate (MBP) (n + iso)	SGS AXYS MLA-059	MLA-059																					Y																											
	Mono-cyclohexyl phthalate (MCHP)	SGS AXYS MLA-059	MLA-059																					Y																											
	Mono-ethyl phthalate (MEP)	SGS AXYS MLA-059	MLA-059																						Y																										
	Mono-iso-nonyl phthalate (MiNP)	SGS AXYS MLA-059	MLA-059																						Y																										
Mono-methyl phthalate (MMP)	SGS AXYS MLA-059	MLA-059																					Y																												
HBCDD	alpha-hexabromocyclododecane (a-HBCDD)	SGS AXYS MLA-070	MLA-070	Y																																															
	beta-hexabromocyclododecane (b-HBCDD)	SGS AXYS MLA-070	MLA-070	Y																																															
	gamma-hexabromocyclododecane (g-HBCDD)	SGS AXYS MLA-070	MLA-070	Y																																															
OC Pesticides	"Organochlorine Pesticides" category (CA only)	EPA 608	MLA-007																							Y																									
		EPA 625	MLA-007																							Y																									
		EPA 8081	MLA-007			Y																																													
	"Pesticides" category (CA only)	EPA 8270	MLA-007			Y																																													
		EPA 625	MLA-007																								Y																								
		EPA 8270	MLA-007			Y					Y	Y															Y																								
	2,4'-DDD	EPA 625	MLA-007																						</																										

Accreditation Scope																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	

Accreditation Scope

SGS AXYS Analytical Services Ltd.
file ref.: ACC-101 Rev. 40

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **
	Endosulphan sulphate	EPA 8081	MLA-007				Y			Y	Y	Y	Y	Y																				
		EPA 1699	MLA-028				Y								Y											Y							Y	
		SGS AXYS MLA-028	MLA-028	Y	Y		Y						Y		Y		Y							Y	Y	Y				Y			Y	
		SGS AXYS MLA-007	MLA-007	Y	Y		Y								Y		Y							Y	Y	Y							Y	
		EPA 608	MLA-007																							Y		Y	Y		Y		Y	
		EPA 8081	MLA-007				Y				Y	Y	Y	Y	Y																			
		EPA 1699	MLA-028				Y								Y											Y							Y	
		SGS AXYS MLA-028	MLA-028	Y	Y		Y						Y		Y		Y							Y	Y	Y				Y			Y	
	Endrin	SGS AXYS MLA-007	MLA-007	Y	Y		Y								Y		Y							Y	Y	Y								Y
		EPA 608	MLA-007																							Y		Y	Y		Y		Y	
		EPA 8081	MLA-007				Y				Y	Y	Y	Y	Y																			
		EPA 1699	MLA-028				Y								Y											Y							Y	
	Endrin aldehyde	SGS AXYS MLA-028	MLA-028	Y	Y		Y						Y		Y		Y							Y	Y	Y				Y			Y	
		SGS AXYS MLA-007	MLA-007	Y	Y		Y								Y		Y							Y	Y	Y							Y	
		EPA 608	MLA-007																							Y		Y	Y		Y		Y	
		EPA 8081	MLA-007				Y				Y	Y	Y	Y	Y																			
	Endrin ketone	EPA 1699	MLA-028				Y								Y											Y							Y	
		SGS AXYS MLA-028	MLA-028	Y	Y		Y						Y		Y		Y							Y	Y	Y				Y			Y	
		SGS AXYS MLA-007	MLA-007	Y	Y		Y								Y		Y							Y	Y	Y							Y	
		EPA 8081	MLA-007				Y				Y		Y		Y																			
	Gamma-HCH (Lindane)	EPA 1699	MLA-028				Y								Y											Y								
		SGS AXYS MLA-028	MLA-028	Y	Y		Y						Y		Y		Y							Y	Y	Y				Y			Y	
		SGS AXYS MLA-007	MLA-007	Y	Y		Y								Y		Y							Y	Y	Y							Y	
		EPA 625	MLA-007																							Y		Y	Y		Y		Y	
		EPA 8270	MLA-007				Y				Y	Y	Y	Y	Y																			
	Heptachlor	EPA 1699	MLA-028				Y								Y											Y								
		SGS AXYS MLA-028	MLA-028	Y	Y		Y						Y		Y		Y							Y	Y	Y				Y			Y	
		SGS AXYS MLA-007	MLA-007	Y	Y		Y								Y		Y							Y	Y	Y							Y	
		EPA 625	MLA-007																							Y		Y	Y		Y		Y	
	Heptachlor epoxide	EPA 8270	MLA-007				Y				Y	Y	Y	Y	Y																			
		EPA 1699	MLA-028				Y								Y											Y								
		SGS AXYS MLA-028	MLA-028	Y	Y		Y						Y		Y		Y							Y	Y	Y				Y			Y	
		SGS AXYS MLA-007	MLA-007	Y	Y		Y								Y		Y							Y	Y	Y							Y	
	Hexachlorobenzene	EPA 8081	MLA-007				Y				Y	Y	Y	Y	Y												Y	Y		Y		Y		
		EPA 1699	MLA-028				Y								Y											Y								
		SGS AXYS MLA-028	MLA-028	Y	Y		Y						Y		Y		Y							Y	Y	Y				Y			Y	
		SGS AXYS MLA-007	MLA-007	Y	Y		Y								Y		Y							Y	Y	Y							Y	
		EPA 1625	MLA-007																							Y		Y					Y	
	Methoxychlor	EPA 8270	MLA-007				Y				Y	Y	Y	Y	Y																			
		EPA 1699	MLA-028				Y								Y											Y								
SGS AXYS MLA-028		MLA-028	Y	Y		Y						Y		Y		Y							Y	Y	Y				Y			Y		
SGS AXYS MLA-007		MLA-007	Y	Y		Y								Y		Y							Y	Y	Y							Y		
EPA 608		MLA-007																							Y		Y	Y				Y		
Mirex	EPA 8270	MLA-007				Y				Y		Y	Y	Y											Y		Y	Y		Y		Y		
	EPA 1699	MLA-028				Y								Y											Y							Y		

Accreditation Scope																																																															
SGS AXYS Analytical Services Ltd. file ref.: ACC-101 Rev. 40																																																															
				Serum										Solids										Tissue										Urine										Water										Water, Non-Potable									
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **																													
		SGS AXYS MLA-028	MLA-028	Y	Y	Y					Y			Y		Y							Y	Y	Y				Y			Y																															
		SGS AXYS MLA-007	MLA-007	Y	Y	Y								Y		Y							Y	Y	Y							Y																															
	Oxychlordane	EPA 8270	MLA-007			Y						Y													Y								Y																														
		EPA 1699	MLA-028			Y								Y											Y								Y																														
		SGS AXYS MLA-028	MLA-028	Y	Y	Y						Y	Y		Y		Y						Y	Y	Y				Y			Y																															
		SGS AXYS MLA-007	MLA-007	Y	Y	Y										Y		Y					Y	Y	Y							Y																															
	Toxaphene	EPA 8270	MLA-007									Y																						Y																													
		SGS AXYS MLA-007	MLA-007		Y												Y						Y																																								
	trans-Chlordane (gamma-Chlordane)	EPA 8270	MLA-007				Y				Y		Y	Y	Y											Y		Y			Y		Y																														
		EPA 1699	MLA-028				Y								Y											Y							Y																														
		SGS AXYS MLA-028	MLA-028	Y	Y	Y						Y	Y		Y		Y						Y	Y	Y				Y			Y																															
		SGS AXYS MLA-007	MLA-007	Y	Y	Y									Y		Y						Y	Y	Y							Y																															
	trans-Nonachlor	EPA 8270	MLA-007				Y					Y	Y													Y							Y																														
		EPA 1699	MLA-028				Y							Y												Y							Y																														
		SGS AXYS MLA-028	MLA-028	Y	Y	Y						Y	Y		Y		Y						Y	Y	Y				Y			Y																															
		SGS AXYS MLA-007	MLA-007	Y	Y	Y									Y		Y						Y	Y	Y							Y																															
PAH	1,2,6-Trimethylphenanthrene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	1,2-Dimethylnaphthalene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	1,4,6,7-Tetramethylnaphthalene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	1,7-Dimethylfluorene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	1,7-Dimethylphenanthrene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	1,8-Dimethylphenanthrene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	1-Methylchrysene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	1-Methylnaphthalene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	1-Methylphenanthrene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	2,3,5-Trimethylnaphthalene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	2,3,6-Trimethylnaphthalene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	2,4-Dimethyldibenzothiophene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	2,6-Dimethylnaphthalene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	2,6-Dimethylphenanthrene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	2-Methylantracene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	2-Methyldibenzothiophene	SGS AXYS MLA-021	MLA-021		Y																		Y																																								
	2-Methylfluorene	SGS AXYS MLA-021	MLA-021		Y																			Y																																							
	2-Methylnaphthalene	EPA 1625	MLA-021																															Y																													
		EPA 8270	MLA-021				Y				Y				Y											Y																																					
		SGS AXYS MLA-021	MLA-021		Y	Y									Y									Y									Y																														
		SGS AXYS MLA-021	MLA-021		Y																			Y																																							
	2-Methylphenanthrene	SGS AXYS MLA-021	MLA-021		Y																			Y																																							
	3,6-Dimethylphenanthrene	SGS AXYS MLA-021	MLA-021		Y																			Y																																							
	3-Methyldibenzothiophene	SGS AXYS MLA-021	MLA-021		Y																			Y																																							
	3-Methylfluoranthene/ Benzo(a)fluorene	SGS AXYS MLA-021	MLA-021		Y																			Y																																							
	3-Methylphenanthrene	SGS AXYS MLA-021	MLA-021		Y																			Y																																							
	5,9-Dimethylchrysene	SGS AXYS MLA-021	MLA-021		Y																			Y																																							
	5/6-Methylchrysenes	SGS AXYS MLA-021	MLA-021		Y																			Y																																							
	7-Methylbenzo(a)pyrene	SGS AXYS MLA-021	MLA-021		Y																			Y																																							
	9/4-Methylphenanthrenes	SGS AXYS MLA-021	MLA-021		Y																			Y																																							
	Acenaphthene	EPA 1625	MLA-021																							Y		Y	Y				Y																														
		EPA 8270	MLA-021				Y				Y	Y		Y	Y																																																
		SGS AXYS MLA-021	MLA-021		Y	Y									Y		Y						Y		Y							Y																															
		EPA 8270	MLA-021				Y				Y	Y		Y	Y												Y	Y				Y																															

Accreditation Scope																Serum									Tissue						Urine	Water	Water, Non-Potable																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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Accreditation Scope																Serum									Tissue			Urine	Water	Water, Non-Potable							
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **			
	BDE-33 2',3,4-tribromodiphenylether	SGS AXYS MLA-033	MLA-033	Y	Y											Y							Y														
		EPA 1614	MLA-033									Y																	Y								
PCB Aroclors	"PCBs" category (CA only)	SGS AXYS MLA-033	MLA-033	Y	Y											Y							Y				Y										
		EPA 625	MLA-007																							Y											
	EPA 8270	MLA-007			Y																																
	PCB Aroclor 1016	EPA 1668	MLA-010				Y							Y	Y												Y					Y	Y				
		EPA 625	MLA-007																								Y		Y	Y		Y	Y				
		EPA 8270	MLA-007				Y				Y	Y			Y												Y		Y								
		SGS AXYS MLA-010	MLA-010				Y								Y												Y						Y				
	SGS AXYS MLA-007	MLA-007		Y	Y									Y		Y							Y	Y	Y							Y					
	EPA 8270	MLA-007									Y																										
	PCB Aroclor 1016/1242	EPA 1668	MLA-010				Y							Y	Y											Y					Y	Y					
		EPA 625	MLA-007																							Y			Y				Y				
		EPA 8270	MLA-007				Y				Y	Y	Y		Y											Y		Y	Y		Y	Y					
		SGS AXYS MLA-010	MLA-010				Y								Y											Y							Y				
	PCB Aroclor 1221	SGS AXYS MLA-007	MLA-007		Y	Y									Y		Y							Y	Y	Y							Y				
		EPA 1668	MLA-010				Y								Y	Y										Y					Y	Y					
		EPA 625	MLA-007																							Y			Y				Y				
		EPA 8270	MLA-007				Y				Y	Y	Y		Y											Y		Y	Y				Y				
	PCB Aroclor 1232	SGS AXYS MLA-010	MLA-010				Y								Y											Y											
		SGS AXYS MLA-007	MLA-007		Y	Y									Y		Y							Y	Y	Y							Y				
		EPA 1668	MLA-010				Y								Y	Y									Y						Y	Y					
		EPA 625	MLA-007																						Y			Y		Y		Y	Y				
	PCB Aroclor 1242	EPA 8270	MLA-007				Y				Y	Y	Y		Y											Y											
		SGS AXYS MLA-010	MLA-010				Y								Y										Y								Y				
		SGS AXYS MLA-007	MLA-007		Y	Y									Y		Y							Y	Y	Y							Y				
		EPA 1668	MLA-010				Y								Y	Y									Y						Y	Y					
	PCB Aroclor 1248	EPA 625	MLA-007																							Y											
		EPA 8270	MLA-007				Y				Y	Y	Y		Y											Y		Y	Y		Y	Y					
		SGS AXYS MLA-010	MLA-010				Y								Y										Y								Y				
		SGS AXYS MLA-007	MLA-007		Y	Y									Y		Y							Y	Y	Y							Y				
	PCB Aroclor 1254	EPA 1668	MLA-010				Y								Y	Y								Y	Y	Y						Y	Y				
		EPA 625	MLA-007																						Y			Y		Y		Y	Y				
		EPA 8270	MLA-007				Y				Y	Y	Y		Y										Y			Y	Y		Y	Y					
		SGS AXYS MLA-010	MLA-010				Y								Y										Y								Y				
	PCB Aroclor 1260	SGS AXYS MLA-007	MLA-007		Y	Y									Y		Y							Y	Y	Y							Y				
		EPA 1668	MLA-010				Y								Y	Y									Y						Y	Y					
		EPA 625	MLA-007																						Y			Y		Y		Y	Y				
		EPA 8270	MLA-007				Y				Y	Y	Y		Y											Y		Y	Y		Y	Y					
	PCB Aroclor 1268	SGS AXYS MLA-010	MLA-010				Y								Y										Y												
		SGS AXYS MLA-007	MLA-007		Y	Y									Y		Y							Y	Y	Y							Y				
		EPA 1668	MLA-010																						Y												
		EPA 8270	MLA-007																							Y											
	PCB congeners	PCB 1 2-Chlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y							Y			Y			Y	Y		Y	Y				
			EPA 8270	MLA-007												Y																					
		PCB 10 2,6-Dichlorobiphenyl	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y					Y	Y	Y								Y				
			EPA 1668	MLA-010				Y				Y	Y	Y	Y	Y								Y			Y		Y	Y		Y	Y				
		PCB 100 2,2',4,4',6-Pentachlorobiphenyl	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y					Y	Y	Y								Y				
			EPA 1668	MLA-010				Y				Y	Y	Y	Y	Y								Y			Y		Y	Y		Y	Y				
		EPA 8270	MLA-007												Y																						
SGS AXYS MLA-010		MLA-010	Y	Y	Y									Y		Y					Y	Y	Y								Y						

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SGS AXYS Analytical Services Ltd. file ref.: ACC-101 Rev. 40																																	

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SGS AXYS Analytical Services Ltd. file ref.: ACC-101 Rev. 40																																			
				Serum	Solids											Tissue					Urine	Water	Water, Non-Potable												
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y					Y		Y	Y	Y	Y	Y	Y	Y				Y		
	PCB 118 2,3',4,4',5-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y			Y		Y		Y	Y	Y		Y	Y		
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y								Y		
		SGS AXYS MLA-901	MLA-901	Y																															
	PCB 118/106	EPA 8270	MLA-007									Y																							
		SGS AXYS MLA-007	MLA-007		Y												Y							Y		Y									
	PCB 119 2,3',4,4',6-Pentachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																							
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y	
	PCB 12 3,4-Dichlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y	
	PCB 12/13	EPA 8270	MLA-007									Y																							
	PCB 120 2,3',4,5,5'-Pentachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y	
	PCB 121 2,3',4,5',6-Pentachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y	
	PCB 122 2,3,3',4',5'-Pentachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																							
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y	
	PCB 123 2,3',4,4',5'-Pentachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																							
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y	
	PCB 124 2,3',4',5,5'-Pentachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																							
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y	
	PCB 125 2,3',4',5',6-Pentachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																							
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y	
	PCB 126 3,3',4,4',5-Pentachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																							
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y	
		SGS AXYS MLA-007	MLA-007		Y												Y						Y		Y										
	PCB 127 3,3',4,5,5'-Pentachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y	
	PCB 128 2,2',3,3',4,4'-Hexachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																							
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y	
		SGS AXYS MLA-007	MLA-007		Y																Y			Y											
	PCB 129 2,2',3,3',4,5-Hexachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																							
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y	
		SGS AXYS MLA-007	MLA-007		Y												Y						Y		Y										
	PCB 13 3,4'-Dichlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y	
	PCB 130 2,2',3,3',4,5'-Hexachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																							
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y	
		SGS AXYS MLA-007	MLA-007		Y												Y						Y		Y										
	PCB 131 2,2',3,3',4,6-Hexachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y							Y	

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Accreditation Scope				Serum	Solids	Tissue	Urine	Water	Water, Non-Potable																									
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID																															
				CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **
	PCB 158/160	EPA 8270	MLA-007							Y							Y																	
		SGS AXYS MLA-007	MLA-007		Y												Y							Y										
	PCB 159 2,3,3',4,5,5'-Hexachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y					Y						Y		Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																						
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y			Y		Y		Y								Y		
		SGS AXYS MLA-007	MLA-007		Y												Y				Y		Y											
	PCB 16 2,2',3-Trichlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y			Y		Y		Y		Y						Y		
	PCB 16/32	EPA 8270	MLA-007								Y																							
		SGS AXYS MLA-007	MLA-007		Y												Y							Y										
	PCB 160 2,3,3',4,5,6-Hexachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y					Y						Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y			Y		Y		Y		Y						Y		
		SGS AXYS MLA-007	MLA-007		Y												Y							Y										
		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y	Y					Y					Y		Y	Y	Y	Y		Y	Y	
	PCB 161 2,3,3',4,5',6-Hexachlorobiphenyl	EPA 8270	MLA-007								Y																							
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y			Y		Y		Y		Y						Y		
		SGS AXYS MLA-007	MLA-007		Y												Y							Y										
		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y	Y					Y					Y		Y	Y	Y	Y		Y	Y	
	PCB 162 2,3,3',4',5,5'-Hexachlorobiphenyl	EPA 8270	MLA-007								Y																							
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y			Y		Y		Y		Y						Y		
		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y	Y					Y					Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y			Y		Y		Y		Y						Y		
	PCB 163 2,3,3',4',5,6-Hexachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y					Y					Y		Y	Y	Y	Y		Y	Y		
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y			Y		Y		Y		Y						Y		
		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y	Y					Y					Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y			Y		Y		Y		Y						Y		
	PCB 164 2,3,3',4',5',6-Hexachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y					Y						Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y			Y		Y		Y		Y						Y		
		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y	Y					Y					Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y			Y		Y		Y		Y						Y		
	PCB 165 2,3,3',5,5',6-Hexachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y					Y					Y		Y	Y	Y	Y		Y	Y		
		EPA 8270	MLA-007									Y																						
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y			Y		Y		Y		Y						Y		
		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y	Y					Y					Y		Y	Y	Y	Y		Y	Y	
	PCB 166 2,3,4,4',5,6-Hexachlorobiphenyl	EPA 8270	MLA-007								Y																							
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y			Y		Y		Y		Y						Y	Y	
		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y	Y					Y					Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y			Y		Y		Y		Y						Y		
	PCB 167 2,3',4,4',5,5'-Hexachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y											Y		Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																						
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y			Y		Y		Y		Y						Y		
		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y	Y					Y					Y		Y	Y	Y	Y		Y	Y	
	PCB 168 2,3',4,4',5',6-Hexachlorobiphenyl	EPA 8270	MLA-007								Y																							
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y			Y		Y		Y		Y						Y		
		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y	Y					Y					Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y			Y		Y		Y		Y						Y		
	PCB 169 3,3',4,4',5,5'-Hexachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y					Y						Y		Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																						
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y			Y		Y		Y		Y						Y		
		SGS AXYS MLA-007	MLA-007		Y												Y							Y										
	PCB 17 2,2',4-Trichlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y											Y		Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																						
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y			Y		Y		Y		Y						Y		
		SGS AXYS MLA-007	MLA-007		Y												Y							Y										
	PCB 170 2,2',3,3',4,4',5-Heptachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y					Y						Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y			Y		Y		Y		Y						Y		
		EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y	Y					Y					Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-901	MLA-901	Y																														
	PCB 170/190	EPA 8270	MLA-007								Y																							
		SGS AXYS MLA-007	MLA-007		Y												Y							Y										
	PCB 171 2,2',3,3',4,4',6-Heptachlorobiphenyl	EPA 1668	MLA-010			Y		Y	Y	Y	Y	Y	Y	Y					Y						Y		Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																						

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SGS AXYS Analytical Services Ltd. file ref.: ACC-101 Rev. 40																																																			
				Serum												Tissue												Urine												Water, Non-Potable											
				Solids																																															
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		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y					Y	CALA	Y		Y								Y																		
		SGS AXYS MLA-007	MLA-007		Y												Y							Y																											
	PCB 172 2,2',3,3',4,5,5'-Heptachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y		Y							Y				Y		Y	Y	Y	Y		Y	Y																		
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y					Y		Y		Y		Y						Y																		
	PCB 172/192	EPA 8270	MLA-007									Y																																							
		SGS AXYS MLA-007	MLA-007		Y												Y							Y																											
	PCB 173 2,2',3,3',4,5,6-Heptachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y	Y		Y	Y																		
		EPA 8270	MLA-007									Y																																							
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y		Y				Y	Y	Y	Y		Y						Y																		
	PCB 174 2,2',3,3',4,5,6'-Heptachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y	Y		Y	Y																		
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y		Y				Y	Y	Y	Y		Y							Y																	
	PCB 174/181	EPA 8270	MLA-007									Y																																							
		SGS AXYS MLA-007	MLA-007		Y												Y							Y																											
	PCB 175 2,2',3,3',4,5',6-Heptachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y																	
		EPA 8270	MLA-007									Y																																							
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y		Y				Y	Y	Y	Y		Y							Y																	
		SGS AXYS MLA-007	MLA-007		Y												Y							Y		Y																									
	PCB 176 2,2',3,3',4,6,6'-Heptachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y																	
		EPA 8270	MLA-007									Y																																							
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y		Y				Y	Y	Y	Y		Y							Y																	
		SGS AXYS MLA-007	MLA-007		Y												Y							Y		Y																									
	PCB 177 2,2',3,3',4,5',6'-Heptachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y																	
		EPA 8270	MLA-007									Y																																							
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y		Y				Y	Y	Y	Y		Y							Y																	
		SGS AXYS MLA-007	MLA-007		Y												Y							Y		Y																									
	PCB 178 2,2',3,3',5,5',6-Heptachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y																	
		EPA 8270	MLA-007									Y																																							
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y		Y				Y	Y	Y	Y		Y							Y																	
		SGS AXYS MLA-007	MLA-007		Y												Y							Y		Y																									
	PCB 179 2,2',3,3',5,6,6'-Heptachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y																	
		EPA 8270	MLA-007									Y																																							
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y		Y				Y	Y	Y	Y		Y							Y																	
		SGS AXYS MLA-007	MLA-007		Y												Y							Y		Y																									
	PCB 18 2,2',5-Trichlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y																	
		EPA 8270	MLA-007									Y																																							
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y		Y				Y	Y	Y	Y		Y							Y																	
		SGS AXYS MLA-007	MLA-007		Y												Y							Y		Y																									
	PCB 180 2,2',3,4,4',5,5'-Heptachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y																	
		EPA 8270	MLA-007									Y																																							
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y		Y				Y	Y	Y	Y		Y							Y																	
		SGS AXYS MLA-007	MLA-007		Y												Y							Y		Y																									
		SGS AXYS MLA-901	MLA-901	Y																																															
	PCB 181 2,2',3,4,4',5,6-Heptachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y																	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y		Y				Y	Y	Y	Y		Y							Y																	
	PCB 182 2,2',3,4,4',5,6'-Heptachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y																	
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y		Y				Y	Y	Y	Y		Y							Y																	
	PCB 183 2,2',3,4,4',5',6-Heptachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y		Y	Y																	
		EPA 8270	MLA-007									Y																																							
		SGS AXYS MLA-010	MLA-010	Y	Y	Y								Y		Y		Y				Y	Y	Y	Y		Y							Y																	
		SGS AXYS MLA-007	MLA-007		Y												Y							Y		Y																									

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				Serum										Solids										Tissue										Urine										Water										Water, Non-Potable									
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **																													
	PCB 197 2,2',3,3',4,4',6,6'-Octachlorobiphenyl	SGS AXYS MLA-007	MLA-007		Y												Y					Y		Y																																							
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y				Y		Y	Y	Y	Y		Y	Y																														
		EPA 8270	MLA-007									Y																																																			
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y				Y		Y		Y								Y																														
	PCB 198 2,2',3,3',4,5,5',6-Octachlorobiphenyl	SGS AXYS MLA-007	MLA-007			Y												Y							Y																																						
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y	Y		Y	Y																													
		EPA 8270	MLA-007										Y																																																		
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y				Y		Y		Y								Y																														
	PCB 199 2,2',3,3',4,5,5',6'-Octachlorobiphenyl	SGS AXYS MLA-007	MLA-007			Y												Y							Y																																						
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y	Y		Y	Y																													
		EPA 8270	MLA-007										Y																																																		
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y				Y		Y		Y								Y																														
	PCB 2 3-Chlorobiphenyl	SGS AXYS MLA-007	MLA-007			Y												Y							Y																																						
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y	Y		Y	Y																													
		EPA 8270	MLA-007										Y																																																		
	PCB 20 2,3,3'-Trichlorobiphenyl	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y				Y		Y		Y									Y																													
		SGS AXYS MLA-007	MLA-007		Y													Y							Y																																						
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y				Y		Y	Y	Y	Y	Y		Y	Y																													
	PCB 200 2,2',3,3',4,5,6,6'-Octachlorobiphenyl	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y				Y		Y		Y									Y																													
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y											Y		Y	Y	Y	Y	Y	Y	Y																													
		EPA 8270	MLA-007										Y																																																		
	PCB 201 2,2',3,3',4,5',6,6'-Octachlorobiphenyl	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y				Y		Y		Y									Y																													
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y	Y	Y	Y	Y																													
		EPA 8270	MLA-007										Y																																																		
		SGS AXYS MLA-007	MLA-007		Y													Y						Y										Y																													
	PCB 202 2,2',3,3',5,5',6,6'-Octachlorobiphenyl	SGS AXYS MLA-007	MLA-007															Y																																													
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y	Y	Y	Y	Y																													
		EPA 8270	MLA-007										Y																																																		
	PCB 203 2,2',3,4,4',5,5',6-Octachlorobiphenyl	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y				Y		Y		Y									Y																													
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y											Y		Y	Y	Y	Y	Y	Y	Y																													
		EPA 8270	MLA-007										Y																																																		
	PCB 204 2,2',3,4,4',5,6,6'-Octachlorobiphenyl	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y				Y		Y		Y									Y																													
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y											Y		Y	Y	Y	Y	Y	Y	Y																													
		EPA 8270	MLA-007										Y																																																		
	PCB 205 2,3,3',4,4',5,5',6-Octachlorobiphenyl	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y				Y		Y		Y									Y																													
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y	Y	Y	Y	Y																													
		EPA 8270	MLA-007										Y																																																		
	PCB 206 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y				Y		Y		Y									Y																													
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y	Y	Y	Y	Y																													
		EPA 8270	MLA-007										Y																																																		
	PCB 207 2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y				Y		Y		Y									Y																													
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y											Y		Y	Y	Y	Y	Y	Y	Y																													
		EPA 8270	MLA-007										Y																																																		
	PCB 208 2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y				Y		Y		Y									Y																													
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y	Y	Y	Y	Y																													
		EPA 8270	MLA-007										Y																																																		
		SGS AXYS MLA-007	MLA-007		Y													Y						Y																																							
PCB 209 Decachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y	Y						Y					Y		Y	Y	Y	Y	Y	Y	Y																														

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																			CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **													
	PCB 35 3,3',4-Trichlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y								Y				Y				Y																			
		EPA 8270	MLA-007										Y																																				
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y					Y		Y		Y									Y														
	PCB 36 3,3',5-Trichlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y								Y				Y				Y						Y													
		EPA 8270	MLA-007										Y																																				
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y					Y		Y		Y									Y														
	PCB 37 3,4,4'-Trichlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y								Y				Y				Y						Y													
		EPA 8270	MLA-007										Y																																				
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y					Y		Y		Y									Y														
	PCB 38 3,4,5-Trichlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y								Y				Y				Y						Y													
		EPA 8270	MLA-007										Y																																				
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y					Y		Y		Y									Y														
	PCB 39 3,4',5-Trichlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y								Y				Y				Y						Y													
		EPA 8270	MLA-007										Y																																				
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y					Y		Y		Y									Y														
	PCB 4 2,2'-Dichlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y								Y				Y				Y						Y													
		EPA 8270	MLA-007										Y																																				
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y					Y		Y		Y									Y														
	PCB 4/10	EPA 8270	MLA-007										Y									Y																											
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y								Y				Y				Y																			
		EPA 8270	MLA-007										Y																																				
	PCB 40 2,2',3,3'-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y								Y				Y				Y						Y													
		EPA 8270	MLA-007										Y																																				
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y					Y		Y		Y									Y														
	PCB 41 2,2',3,4-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y								Y				Y				Y						Y													
		EPA 8270	MLA-007										Y																																				
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y					Y		Y		Y									Y														
	PCB 41/71/64/68	EPA 8270	MLA-007										Y									Y																											
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y								Y				Y				Y																			
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y					Y		Y		Y									Y														
	PCB 42 2,2',3,4'-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y								Y				Y				Y						Y													
		EPA 8270	MLA-007										Y																																				
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y					Y		Y		Y									Y														
	PCB 42/59	EPA 8270	MLA-007										Y																																				
		EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y								Y				Y				Y																			
		SGS AXYS MLA-007	MLA-007		Y																	Y		Y																									
	PCB 43 2,2',3,5-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y								Y				Y				Y						Y													
		EPA 8270	MLA-007										Y																																				
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y					Y		Y		Y									Y														
	PCB 44 2,2',3,5'-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y								Y				Y				Y						Y													
		EPA 8270	MLA-007										Y																																				
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y					Y		Y		Y									Y														
	PCB 45 2,2',3,6-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y								Y				Y				Y						Y													
		EPA 8270	MLA-007										Y																																				
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y					Y		Y		Y									Y														
	PCB 46 2,2',3,6'-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y								Y				Y				Y						Y													
		EPA 8270	MLA-007										Y																																				
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y					Y		Y		Y									Y														
	PCB 47 2,2',4,4'-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y								Y				Y				Y						Y													
		EPA 8270	MLA-007										Y																																				
		SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y					Y		Y		Y									Y														
	PCB 47/48/75	EPA 8270	MLA-007										Y																																				
EPA 1668		MLA-010				Y		Y	Y	Y	Y	Y	Y								Y				Y				Y																				
SGS AXYS MLA-007		MLA-007		Y																	Y		Y																										
PCB 48 2,2',4,5-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y								Y				Y				Y						Y														
	EPA 8270	MLA-007										Y																																					
	SGS AXYS MLA-010	MLA-010	Y	Y	Y									Y		Y					Y		Y		Y									Y															

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **
	PCB 49 2,2',4,5'-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y		Y	Y		
		SGS AXYS MLA-010	MLA-010	Y	Y		Y							Y		Y					Y		Y		Y							Y		
	PCB 49/43	EPA 8270	MLA-007									Y													Y	Y	Y	Y	Y					
		SGS AXYS MLA-007	MLA-007		Y													Y						Y										
	PCB 5 2,3-Dichlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y		Y	Y		
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y			Y	Y			Y		
	PCB 50 2,2',4,6-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y							Y				Y		Y	Y	Y	Y		Y	Y
		EPA 8270	MLA-007										Y																					
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y			Y	Y				Y	
		SGS AXYS MLA-007	MLA-007		Y													Y				Y		Y		Y								
	PCB 51 2,2',4,6'-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007										Y																					
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y								Y	
	PCB 52 2,2',5,5'-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y								Y	
		EPA 8270	MLA-007										Y																					
	PCB 52/73	EPA 8270	MLA-007										Y																					
		SGS AXYS MLA-007	MLA-007		Y													Y						Y										
	PCB 53 2,2',5,6'-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007										Y																					
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y								Y	
	PCB 54 2,2',6,6'-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007										Y																					
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y								Y	
	PCB 55 2,3,3',4-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007										Y																					
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y								Y	
	PCB 56 2,3,3',4'-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y								Y	
	PCB 56/60	EPA 8270	MLA-007										Y																					
		SGS AXYS MLA-007	MLA-007		Y													Y						Y										
	PCB 57 2,3,3',5-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007										Y																					
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y								Y	
	PCB 58 2,3,3',5'-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007										Y																					
SGS AXYS MLA-010		MLA-010	Y	Y		Y								Y		Y				Y		Y		Y								Y		
PCB 59 2,3,3',6-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y		Y	Y		
	SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y								Y		
PCB 6 2,3'-Dichlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y		Y	Y		
	EPA 8270	MLA-007										Y																						
	SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y								Y		
PCB 60 2,3,4,4'-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y		Y	Y		
	SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y								Y		
PCB 61 2,3,4,5-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y		Y	Y		
	SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y								Y		
PCB 62 2,3,4,6-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y		Y	Y		
	SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y								Y		
PCB 62/65	EPA 8270	MLA-007										Y																						
	EPA 1668	MLA-010				Y			Y	Y	Y	Y	Y	Y							Y				Y	Y	Y	Y	Y		Y	Y		
PCB 63 2,3,4',5-Tetrachlorobiphenyl	EPA 8270	MLA-007										Y																						

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Accreditation Scope																																			
SGS AXYS Analytical Services Ltd. file ref.: ACC-101 Rev. 40																																			
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **	
	PCB 8 2,4'-Dichlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y				Y										
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y							Y			
	PCB 8/5	EPA 8270	MLA-007									Y																							
		SGS AXYS MLA-007	MLA-007		Y												Y							Y											
	PCB 80 3,3',5,5'-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y		Y	Y		
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y							Y			
	PCB 81 3,4,4',5-Tetrachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																							
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y							Y			
	PCB 82 2,2',3,3',4-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y		Y	Y		
		EPA 8270	MLA-007									Y																							
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y							Y			
	PCB 83 2,2',3,3',5-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y		Y	Y		
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y							Y			
		EPA 8270	MLA-007									Y																							
	PCB 83/108	SGS AXYS MLA-007	MLA-007		Y												Y																		
	PCB 84 2,2',3,3',6-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y		Y	Y		
		EPA 8270	MLA-007									Y																							
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y							Y			
		SGS AXYS MLA-007	MLA-007		Y												Y							Y											
	PCB 85 2,2',3,4,4'-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y					Y			
	PCB 85/120	EPA 8270	MLA-007									Y																							
		SGS AXYS MLA-007	MLA-007		Y												Y								Y										
	PCB 86 2,2',3,4,5-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y							Y			
	PCB 87 2,2',3,4,5'-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y							Y			
	PCB 87/115/116	EPA 8270	MLA-007									Y																							
		SGS AXYS MLA-007	MLA-007		Y												Y																		
	PCB 88 2,2',3,4,6-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y							Y			
	PCB 88/121	EPA 8270	MLA-007									Y																							
	PCB 89 2,2',3,4,6'-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y								Y		
	PCB 9 2,5-Dichlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y		Y					Y			
	PCB 90 2,2',3,4',5-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y							Y			
	PCB 91 2,2',3,4',6-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																							
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y							Y			
		SGS AXYS MLA-007	MLA-007		Y												Y							Y											
	PCB 92 2,2',3,5,5'-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																							
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y							Y			
	PCB 93 2,2',3,5,6-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y	
		SGS AXYS MLA-010	MLA-010	Y	Y		Y								Y		Y				Y		Y		Y							Y			
	PCB 94 2,2',3,5,6'-Pentachlorobiphenyl	EPA 1668	MLA-010				Y		Y	Y	Y	Y	Y	Y							Y					Y		Y	Y	Y	Y		Y	Y	
		EPA 8270	MLA-007									Y																							

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum										Solids									
				CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA
		SGS AXYS MLA-010	MLA-010											Y							Y		
		EPA 1668	MLA-010											Y							Y		
	Sum - Pentachlorobiphenyls (BZ-83 + BZ-99)	SGS AXYS MLA-010	MLA-010											Y							Y		
		EPA 1668	MLA-010											Y							Y		
	Sum - Pentachlorobiphenyls (BZ-85 + BZ-116 + BZ-117)	SGS AXYS MLA-010	MLA-010											Y							Y		
		EPA 1668	MLA-010											Y							Y		
	Sum - Pentachlorobiphenyls (BZ-86 + BZ-87 + BZ 97 + BZ-109 + BZ-119 + BZ-125)	SGS AXYS MLA-010	MLA-010											Y							Y		
		EPA 1668	MLA-010											Y							Y		
	Sum - Pentachlorobiphenyls (BZ-86 + BZ-87 + BZ-97 + BZ-108 + BZ-119 +BZ-125)	SGS AXYS MLA-010	MLA-010											Y							Y		
		EPA 1668	MLA-010											Y							Y		
	Sum - Pentachlorobiphenyls (BZ-88 + BZ-91)	SGS AXYS MLA-010	MLA-010											Y							Y		
		EPA 1668	MLA-010											Y							Y		
	Sum - Pentachlorobiphenyls (BZ-90 + BZ-101 + BZ-113)	SGS AXYS MLA-010	MLA-010											Y							Y		
		EPA 1668	MLA-010											Y							Y		
	Sum - Pentachlorobiphenyls (BZ-93 + BZ-95 + BZ-98 + BZ-100 + BZ-102)	SGS AXYS MLA-010	MLA-010											Y							Y		
		EPA 1668	MLA-010											Y							Y		
	Sum - Tetrachlorobiphenyls (BZ-40 + BZ-41 + BZ-71)	SGS AXYS MLA-010	MLA-010											Y							Y		
		EPA 1668	MLA-010											Y							Y		
	Sum - Tetrachlorobiphenyls (BZ-44 + BZ-47 + BZ-65)	SGS AXYS MLA-010	MLA-010											Y							Y		
		EPA 1668	MLA-010											Y							Y		
	Sum - Tetrachlorobiphenyls (BZ-45 + BZ-51)	SGS AXYS MLA-010	MLA-010											Y							Y		
		EPA 1668	MLA-010											Y							Y		
	Sum - Tetrachlorobiphenyls (BZ-49 + BZ-69)	SGS AXYS MLA-010	MLA-010											Y							Y		
		EPA 1668	MLA-010											Y							Y		
	Sum - Tetrachlorobiphenyls (BZ-50 + BZ-53)	SGS AXYS MLA-010	MLA-010											Y							Y		
		EPA 1668	MLA-010											Y							Y		
	Sum - Tetrachlorobiphenyls (BZ-59 + BZ-62 + BZ-75)	SGS AXYS MLA-010	MLA-010											Y							Y		
		EPA 1668	MLA-010											Y							Y		
	Sum - Tetrachlorobiphenyls (BZ-61 + BZ-70 + BZ-74 + BZ-76)	SGS AXYS MLA-010	MLA-010											Y							Y		
		EPA 1668	MLA-010											Y							Y		
	Sum - Trichlorobiphenyls (BZ-18 + BZ-30)	SGS AXYS MLA-010	MLA-010											Y							Y		
		EPA 1668	MLA-010											Y							Y		
	Sum - Trichlorobiphenyls (BZ-20 + BZ-28)	SGS AXYS MLA-010	MLA-010											Y							Y		
		EPA 1668	MLA-010											Y							Y		
	Sum - Trichlorobiphenyls (BZ-21 + BZ-33)	SGS AXYS MLA-010	MLA-010											Y							Y		
		EPA 1668	MLA-010											Y							Y		
	Sum - Trichlorobiphenyls (BZ-26 + BZ-29)	SGS AXYS MLA-010	MLA-010											Y							Y		
		EPA 1668	MLA-010											Y							Y		
	Total Dichlorobiphenyls	SGS AXYS MLA-010	MLA-010											Y							Y		
		EPA 1668	MLA-010											Y							Y		
		EPA 8270	MLA-007										Y										
		SGS AXYS MLA-010	MLA-010	Y	Y									Y		Y		Y		Y		Y	
	Total Heptachlorobiphenyls	SGS AXYS MLA-007	MLA-007			Y										Y				Y			
		EPA 1668	MLA-010											Y									
		EPA 8270	MLA-007									Y											
		SGS AXYS MLA-010	MLA-010	Y	Y									Y		Y		Y		Y		Y	
	Total Hexachlorobiphenyls	SGS AXYS MLA-007	MLA-007			Y										Y				Y			
		EPA 1668	MLA-010											Y									
		EPA 8270	MLA-007									Y											
		SGS AXYS MLA-010	MLA-010	Y	Y									Y		Y		Y		Y		Y	
	Total Monochlorobiphenyls	SGS AXYS MLA-007	MLA-007			Y										Y				Y			
		EPA 1668	MLA-010											Y							Y		

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **											
	Total Nonachlorobiphenyls	SGS AXYS MLA-010	MLA-010	Y	Y									Y		Y					Y		Y										Y												
		EPA 1668	MLA-010												Y							Y												Y											
	Total Octachlorobiphenyls	EPA 8270	MLA-007									Y																																	
		SGS AXYS MLA-010	MLA-010	Y	Y										Y		Y					Y		Y										Y											
		SGS AXYS MLA-007	MLA-007		Y													Y						Y																					
		EPA 1668	MLA-010												Y							Y												Y											
	Total PCBs	EPA 8270	MLA-007									Y																																	
		SGS AXYS MLA-010	MLA-010	Y	Y										Y		Y					Y		Y										Y											
		SGS AXYS MLA-007	MLA-007		Y													Y						Y																					
		EPA 1668	MLA-010												Y							Y													Y										
	Total Pentachlorobiphenyls	SGS AXYS MLA-010	MLA-010												Y							Y													Y										
		EPA 1668	MLA-010												Y							Y													Y										
		EPA 8270	MLA-007									Y																																	
		SGS AXYS MLA-010	MLA-010	Y	Y										Y		Y					Y		Y										Y											
	Total Polychlorinated biphenyls	SGS AXYS MLA-007	MLA-007		Y													Y						Y																					
		SGS AXYS MLA-007	MLA-007		Y													Y						Y																					
	Total Tetrachlorobiphenyls	EPA 1668	MLA-010												Y							Y													Y										
		EPA 8270	MLA-007									Y																																	
		SGS AXYS MLA-010	MLA-010	Y	Y										Y		Y					Y		Y										Y											
		SGS AXYS MLA-007	MLA-007		Y													Y						Y											Y										
	Total Trichlorobiphenyls	EPA 1668	MLA-010												Y							Y													Y										
		EPA 8270	MLA-007									Y																																	
		SGS AXYS MLA-010	MLA-010	Y	Y										Y		Y					Y		Y										Y											
		SGS AXYS MLA-007	MLA-007		Y													Y						Y											Y										
PCDDF	"Dioxins and Dibenzofurans" category (CA only)	EPA 1613	MLA-017																						Y																				
		EPA 8290	MLA-017			Y																																							
	1,2,3,4,6,7,8-HpCDD	EPA 1613	MLA-017									Y		Y							Y				Y		Y	Y	Y	Y	Y	Y	Y	Y											
		EPA 8290	MLA-017				Y		Y	Y	Y		Y	Y				Y	Y	Y	Y	Y			Y		Y	Y						Y											
	1,2,3,4,6,7,8-HpCDF	SGS AXYS MLA-017	MLA-017	Y	Y	Y									Y		Y	Y		Y		Y		Y		Y		Y	Y					Y											
		EPA 1613	MLA-017									Y		Y								Y				Y		Y	Y	Y	Y	Y	Y	Y											
	1,2,3,4,7,8,9-HpCDF	EPA 8290	MLA-017			Y		Y	Y	Y		Y	Y				Y	Y	Y	Y	Y				Y		Y	Y	Y					Y											
		SGS AXYS MLA-017	MLA-017	Y	Y	Y									Y		Y	Y		Y		Y		Y		Y		Y						Y											
	1,2,3,4,7,8,9-HxCDD	EPA 1613	MLA-017									Y		Y								Y				Y		Y	Y	Y	Y	Y	Y	Y	Y										
		EPA 8290	MLA-017				Y		Y	Y	Y		Y	Y				Y	Y	Y	Y	Y			Y		Y	Y						Y											
	1,2,3,4,7,8-HxCDF	SGS AXYS MLA-017	MLA-017	Y	Y	Y									Y		Y	Y		Y		Y		Y		Y		Y							Y										
		EPA 1613	MLA-017									Y		Y								Y				Y		Y	Y	Y	Y	Y	Y	Y	Y										
	1,2,3,6,7,8-HxCDD	EPA 8290	MLA-017				Y		Y	Y	Y		Y	Y				Y	Y	Y	Y	Y			Y		Y		Y	Y					Y										
		SGS AXYS MLA-017	MLA-017	Y	Y	Y									Y		Y	Y		Y		Y		Y		Y		Y						Y											
	1,2,3,6,7,8-HxCDF	EPA 1613	MLA-017									Y		Y								Y				Y		Y	Y	Y	Y	Y	Y	Y	Y										
		EPA 8290	MLA-017				Y		Y	Y	Y		Y	Y				Y	Y	Y	Y	Y			Y		Y		Y					Y											
	1,2,3,7,8,9-HxCDD	SGS AXYS MLA-017	MLA-017	Y	Y	Y									Y		Y	Y		Y		Y		Y		Y		Y						Y											
		EPA 1613	MLA-017									Y		Y								Y				Y		Y	Y	Y	Y	Y	Y	Y	Y										
		EPA 8290	MLA-017				Y		Y	Y	Y		Y	Y				Y	Y	Y	Y	Y			Y		Y		Y						Y										
		SGS AXYS MLA-017	MLA-017	Y	Y	Y									Y		Y	Y		Y		Y		Y		Y		Y						Y											

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **
	Total PeCDF	SGS AXYS MLA-017	MLA-017			Y								Y		Y			Y	Y				Y						Y	Y			
		EPA 1613	MLA-017												Y										Y					Y	Y			
		EPA 8290	MLA-017				Y		Y		Y	Y		Y	Y		Y	Y	Y	Y	Y				Y				Y			Y		
	Total TCDD	SGS AXYS MLA-017	MLA-017			Y									Y				Y						Y									
		EPA 1613	MLA-017												Y										Y					Y	Y			
		EPA 8290	MLA-017				Y		Y		Y	Y		Y	Y		Y	Y	Y	Y	Y				Y				Y			Y		
	Total TCDF	SGS AXYS MLA-017	MLA-017			Y									Y		Y								Y								Y	
		EPA 1613	MLA-017												Y										Y					Y	Y			
		EPA 8290	MLA-017				Y		Y		Y	Y		Y	Y		Y	Y	Y	Y	Y				Y				Y			Y		
	PFAS	4:2 Fluorotelomersulfonate (4:2 FTS)	SGS AXYS MLA-017	MLA-017			Y								Y		Y			Y					Y								Y	
			SGS AXYS MLA-081	MLA-081																														
			SGS AXYS MLA-089	MLA-089												Y																		
6:2 Fluorotelomersulfonate (6:2 FTS)		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
		SGS AXYS MLA-081	MLA-081																													Y		
		SGS AXYS MLA-089	MLA-089												Y																			
8:2 Fluorotelomersulfonate (8:2 FTS)		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
		SGS AXYS MLA-081	MLA-081																													Y		
		SGS AXYS MLA-089	MLA-089												Y																			
N-Ethylperfluorooctanesulfonamide (N-EtFOSA)		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
N-Ethylperfluorooctanesulfonamidoacetic acid (N-EtFOSAA)		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
N-Ethylperfluorooctanesulfonamidoethanol (N-EtFOSE)		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
N-Methylperfluorooctanesulfonamide (N-MeFOSA)		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
N-Methylperfluorooctanesulfonamidoacetic acid (N-MeFOSAA)		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
N-Methylperfluorooctanesulfonamidoethanol (N-MeFOSE)		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
Perfluorobutanesulfonate (PFBS)		SGS AXYS MLA-060	MLA-060																				Y	Y	Y	Y					Y			
		SGS AXYS MLA-041	MLA-041		Y	Y	Y	Y							Y																			
		SGS AXYS MLA-043	MLA-043														Y	Y	Y	Y	Y	Y												
Perfluorobutanoate (PFBA)		SGS AXYS MLA-042	MLA-042	Y																														
		SGS AXYS MLA-110	MLA-110		Y	Y	Y				Y	Y	Y	Y									Y	Y				Y		Y	Y			
		SGS AXYS MLA-060	MLA-060																				Y	Y	Y	Y					Y			
Perfluorodecanesulfonate (PFDS)		SGS AXYS MLA-041	MLA-041		Y	Y	Y	Y							Y																			
		SGS AXYS MLA-043	MLA-043														Y	Y	Y	Y	Y	Y												
		SGS AXYS MLA-042	MLA-042	Y																														
Perfluorodecanoate (PFDA)		SGS AXYS MLA-110	MLA-110		Y	Y	Y				Y	Y	Y	Y									Y	Y				Y		Y	Y			
		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
Perfluorododecanesulfonate (PFDoS)		SGS AXYS MLA-110	MLA-110		Y	Y	Y				Y	Y	Y	Y									Y	Y				Y		Y	Y			
		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
		SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y			
Perfluorododecanoate (PFDoA)		SGS AXYS MLA-060	MLA-060																				Y	Y	Y	Y					Y			
		SGS AXYS MLA-041	MLA-041		Y	Y	Y	Y							Y																			
		SGS AXYS MLA-043	MLA-043														Y	Y	Y	Y	Y	Y												
Perfluoroheptanesulfonate (PFHpS)		SGS AXYS MLA-042	MLA-042	Y																														
		SGS AXYS MLA-110	MLA-110		Y	Y	Y				Y	Y	Y	Y									Y	Y				Y		Y	Y			
	SGS AXYS MLA-110	MLA-110		Y	Y					Y	Y	Y	Y									Y	Y				Y		Y	Y				
Perfluoroheptanoate (PFHpA)	SGS AXYS MLA-060	MLA-060																				Y	Y	Y	Y					Y				
	SGS AXYS MLA-041	MLA-041		Y	Y	Y	Y							Y																				

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SGS AXYS Analytical Services Ltd. file ref.: ACC-101 Rev. 40																																		
				Serum		Solids										Tissue						Urine		Water		Water, Non-Potable								
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **
	Perfluorohexanesulfonate (PFHxS)	SGS AXYS MLA-043	MLA-043													Y	Y	Y	Y		Y													
		SGS AXYS MLA-042	MLA-042	Y																														
		SGS AXYS MLA-110	MLA-110		Y		Y	Y				Y		Y	Y									Y	Y	Y						Y	Y	
		SGS AXYS MLA-060	MLA-060																				Y										Y	
		SGS AXYS MLA-041	MLA-041		Y		Y	Y	Y					Y																				
		SGS AXYS MLA-043	MLA-043														Y	Y	Y	Y		Y												
	Perfluorohexanoate (PFHxA)	SGS AXYS MLA-042	MLA-042	Y																														
		SGS AXYS MLA-110	MLA-110		Y		Y	Y				Y		Y	Y									Y	Y	Y				Y		Y	Y	
		SGS AXYS MLA-060	MLA-060																				Y										Y	
		SGS AXYS MLA-041	MLA-041		Y		Y	Y	Y					Y																				
		SGS AXYS MLA-043	MLA-043														Y	Y	Y	Y		Y												
		SGS AXYS MLA-042	MLA-042	Y																														
	Perfluorononanesulfonate (PFNS)	SGS AXYS MLA-110	MLA-110		Y		Y	Y				Y		Y	Y								Y	Y	Y				Y		Y	Y		
		SGS AXYS MLA-060	MLA-060		Y		Y					Y		Y	Y								Y	Y	Y							Y	Y	
		SGS AXYS MLA-041	MLA-041		Y		Y	Y	Y					Y																				
	Perfluorononanoate (PFNA)	SGS AXYS MLA-043	MLA-043														Y	Y	Y	Y		Y												
		SGS AXYS MLA-042	MLA-042	Y																														
		SGS AXYS MLA-110	MLA-110		Y		Y	Y				Y		Y	Y								Y	Y	Y				Y		Y	Y		
		SGS AXYS MLA-060	MLA-060		Y		Y	Y	Y					Y									Y	Y	Y	Y						Y		
		SGS AXYS MLA-041	MLA-041		Y		Y	Y	Y					Y																				
	Perfluorooctanesulfonamide (PFOSA), a.k.a. FOSA	SGS AXYS MLA-060	MLA-060																				Y	Y	Y	Y								
		SGS AXYS MLA-041	MLA-041		Y		Y	Y	Y					Y									Y	Y	Y	Y								
		SGS AXYS MLA-043	MLA-043														Y	Y	Y	Y		Y												
		SGS AXYS MLA-042	MLA-042	Y																														
		SGS AXYS MLA-110	MLA-110		Y		Y	Y				Y		Y	Y								Y	Y	Y				Y		Y	Y		
		SGS AXYS MLA-041	MLA-041		Y		Y	Y	Y					Y																				
	Perfluorooctanesulfonate (PFOS)	SGS AXYS MLA-043	MLA-043														Y	Y	Y	Y		Y												
		SGS AXYS MLA-042	MLA-042	Y																														
		SGS AXYS MLA-110	MLA-110		Y		Y	Y				Y		Y	Y								Y	Y	Y				Y		Y	Y		
		SGS AXYS MLA-060	MLA-060																				Y	Y	Y	Y						Y		
		SGS AXYS MLA-041	MLA-041		Y		Y	Y	Y					Y																				
		SGS AXYS MLA-043	MLA-043														Y	Y	Y	Y		Y												
	Perfluorooctanoate (PFOA)	SGS AXYS MLA-042	MLA-042	Y																														
		SGS AXYS MLA-110	MLA-110		Y		Y	Y				Y		Y	Y								Y	Y	Y				Y		Y	Y		
		SGS AXYS MLA-060	MLA-060																				Y	Y	Y	Y						Y		
		SGS AXYS MLA-041	MLA-041		Y		Y	Y	Y					Y																				
		SGS AXYS MLA-043	MLA-043														Y	Y	Y	Y		Y												
		SGS AXYS MLA-042	MLA-042	Y																														
	Perfluoropentanesulfonate (PFPeS)	SGS AXYS MLA-110	MLA-110		Y		Y	Y				Y		Y	Y								Y	Y	Y				Y		Y	Y		
		SGS AXYS MLA-060	MLA-060		Y		Y					Y		Y	Y																			
		SGS AXYS MLA-041	MLA-041		Y		Y	Y	Y					Y																				
	Perfluoropentanoate (PFPeA)	SGS AXYS MLA-043	MLA-043														Y	Y	Y	Y		Y												
SGS AXYS MLA-042		MLA-042	Y																															
SGS AXYS MLA-110		MLA-110		Y		Y	Y				Y		Y	Y								Y	Y	Y				Y		Y	Y			
SGS AXYS MLA-060		MLA-060																																
Perfluorotetradecanoate (PFTeDA)	SGS AXYS MLA-041	MLA-041		Y		Y	Y				Y		Y																					
	SGS AXYS MLA-110	MLA-110		Y		Y	Y				Y		Y									Y	Y	Y				Y		Y	Y			
	SGS AXYS MLA-060	MLA-060		Y		Y					Y		Y																					
	SGS AXYS MLA-043	MLA-043														Y	Y	Y	Y		Y													
	SGS AXYS MLA-042	MLA-042	Y																															
	SGS AXYS MLA-110	MLA-110		Y		Y	Y				Y		Y	Y														Y		Y	Y			
Perfluorotridecanoate (PFTriDA)	SGS AXYS MLA-060	MLA-060																																
	SGS AXYS MLA-041	MLA-041		Y		Y	Y	Y					Y																					
	SGS AXYS MLA-043	MLA-043														Y	Y	Y	Y		Y													
	SGS AXYS MLA-042	MLA-042	Y																															
Perfluoroundecanoate (PFUnA)	SGS AXYS MLA-110	MLA-110		Y		Y	Y				Y		Y	Y														Y		Y	Y			
	SGS AXYS MLA-041	MLA-041		Y		Y	Y	Y					Y																					
	SGS AXYS MLA-043	MLA-043														Y	Y	Y	Y		Y													
	SGS AXYS MLA-042	MLA-042	Y																															
PPCP	1,7-Dimethylxanthine	EPA 1694	MLA-075											Y																				
		SGS AXYS MLA-075	MLA-075		Y																													
	10-hydroxy-amitriptyline	SGS AXYS MLA-075	MLA-075		Y																													

Accreditation Scope				Serum															Tissue					Urine	Water	Water, Non-Potable								
				Solids																														
				CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID																															
	2-hydroxy-ibuprofen	SGS AXYS MLA-075	MLA-075		Y																		Y											
	4-Epianhydrochlortetracycline (EACTC)	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	4-Epianhydrotetracycline (EATC)	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	4-Epichlortetracycline (ECTC)	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	4-Epioxytetracycline (EOTC)	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	4-Epitetracycline (ETC)	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Acetaminophen	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Albuterol	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Alprazolam	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Amitriptyline	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Amlodipine	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Amphetamine	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Anhydrochlortetracycline (ACTC)	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Anhydrotetracycline (ATC)	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Atenolol	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Atorvastatin	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Azithromycin	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Benzoyllecgonine	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Benztropine	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Betamethasone	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Bisphenol A	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Caffeine	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Carbadox	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Carbamazepine	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Cefotaxime	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Chlortetracycline (CTC)	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Cimetidine	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Ciprofloxacin	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Clarithromycin	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Clinafloxacin	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum		Tissue	Urine	Water	Water, Non-Potable
				CALA	Solids				
				CALA	California DPH Florida DOH Minnesota DOH New Jersey DEP New York DOH Virginia DGS Washington DE Maine DOH ANAB ISO 17025 ANAB DoD **	CALA Florida DOH Minnesota DOH New Jersey DEP Virginia DGS ANAB ISO 17025	CALA	CALA	California DPH Florida DOH Minnesota DOH New Jersey DEP New York DOH Virginia DGS Washington DE * Maine DOH Pennsylvania DEP ANAB ISO 17025 ANAB DoD **
	Clonidine	SGS AXYS MLA-075	MLA-075		Y			Y	
	Cloxacillin	EPA 1694	MLA-075			Y			Y
		SGS AXYS MLA-075	MLA-075		Y			Y	
	Cocaine	SGS AXYS MLA-075	MLA-075		Y			Y	
	Codeine	EPA 1694	MLA-075			Y			Y
		SGS AXYS MLA-075	MLA-075		Y			Y	
	Cotinine	EPA 1694	MLA-075			Y			Y
		SGS AXYS MLA-075	MLA-075		Y			Y	
	DEET (N,N-diethyl-m-toluamide)	SGS AXYS MLA-075	MLA-075		Y			Y	
	Dehydronifedipine	EPA 1694	MLA-075			Y			Y
		SGS AXYS MLA-075	MLA-075		Y			Y	
	Demeclocycline	EPA 1694	MLA-075			Y			Y
		SGS AXYS MLA-075	MLA-075		Y			Y	
	Desmethyldiltiazem	SGS AXYS MLA-075	MLA-075		Y			Y	
	Diazepam	SGS AXYS MLA-075	MLA-075		Y			Y	
	Digoxigenin	EPA 1694	MLA-075			Y			Y
		SGS AXYS MLA-075	MLA-075		Y			Y	
	Digoxin	EPA 1694	MLA-075			Y			Y
		SGS AXYS MLA-075	MLA-075		Y			Y	
	Diltiazem	EPA 1694	MLA-075			Y			Y
		SGS AXYS MLA-075	MLA-075		Y			Y	
	Diphenhydramine	EPA 1694	MLA-075			Y			Y
		SGS AXYS MLA-075	MLA-075		Y			Y	
	Doxycycline	EPA 1694	MLA-075			Y			Y
		SGS AXYS MLA-075	MLA-075		Y			Y	
	Enalapril	EPA 1694	MLA-075			Y			Y
		SGS AXYS MLA-075	MLA-075		Y			Y	
	Enrofloxacin	EPA 1694	MLA-075			Y			Y
		SGS AXYS MLA-075	MLA-075		Y			Y	
	Erythromycin	SGS AXYS MLA-075	MLA-075		Y			Y	
	Erythromycin anhydrate	EPA 1694	MLA-075			Y			Y
	Flumequine	EPA 1694	MLA-075			Y			Y
		SGS AXYS MLA-075	MLA-075		Y			Y	
	Fluocinonide	SGS AXYS MLA-075	MLA-075		Y			Y	
	Fluoxetine	EPA 1694	MLA-075			Y			Y
		SGS AXYS MLA-075	MLA-075		Y			Y	
	Fluticasone propionate	SGS AXYS MLA-075	MLA-075		Y			Y	
	Furosemide	SGS AXYS MLA-075	MLA-075		Y			Y	
	Gemfibrozil	EPA 1694	MLA-075			Y			Y
		SGS AXYS MLA-075	MLA-075		Y			Y	
	Glipizide	SGS AXYS MLA-075	MLA-075		Y			Y	
	Glyburide	SGS AXYS MLA-075	MLA-075		Y			Y	
	Hydrochlorothiazide	SGS AXYS MLA-075	MLA-075		Y			Y	
	Hydrocodone	SGS AXYS MLA-075	MLA-075		Y			Y	
	Hydrocortisone	SGS AXYS MLA-075	MLA-075		Y			Y	
	Ibuprofen	EPA 1694	MLA-075			Y			Y
		SGS AXYS MLA-075	MLA-075		Y			Y	
	Isochlortetracycline (ICTC)	EPA 1694	MLA-075			Y			Y
		SGS AXYS MLA-075	MLA-075		Y			Y	
	Lincomycin	EPA 1694	MLA-075			Y			Y

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Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Lomefloxacin	EPA 1694	MLA-075									Y																			Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Meprobamate	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Metformin	EPA 1694	MLA-075									Y																		Y				
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Methylprednisolone	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Metoprolol	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Miconazole	EPA 1694	MLA-075									Y																		Y				
		SGS AXYS MLA-075	MLA-075		Y								Y										Y									Y		
	Minocycline	EPA 1694	MLA-075									Y																			Y			
		SGS AXYS MLA-075	MLA-075		Y								Y										Y									Y		
	Naproxen	EPA 1694	MLA-075									Y																			Y			
		SGS AXYS MLA-075	MLA-075		Y								Y										Y									Y		
	Norfloxacin	EPA 1694	MLA-075									Y																				Y		
		SGS AXYS MLA-075	MLA-075		Y								Y										Y									Y		
	Norfluoxetine	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Norgestimate	EPA 1694	MLA-075									Y																			Y			
		SGS AXYS MLA-075	MLA-075		Y								Y										Y									Y		
	Norverapamil	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Ofloxacin	EPA 1694	MLA-075									Y																				Y		
		SGS AXYS MLA-075	MLA-075		Y								Y										Y											
	Ormetoprim	EPA 1694	MLA-075									Y																				Y		
		SGS AXYS MLA-075	MLA-075		Y								Y										Y									Y		
	Oxacillin	EPA 1694	MLA-075									Y																				Y		
		SGS AXYS MLA-075	MLA-075		Y								Y										Y											
	Oxolinic acid	EPA 1694	MLA-075									Y																				Y		
		SGS AXYS MLA-075	MLA-075		Y								Y										Y										Y	
	Oxycodone	EPA 1694	MLA-075									Y																				Y		
		SGS AXYS MLA-075	MLA-075		Y								Y										Y										Y	
	Oxytetracycline (OTC)	EPA 1694	MLA-075									Y																				Y		
		SGS AXYS MLA-075	MLA-075		Y								Y										Y										Y	
	Paroxetine	EPA 1694	MLA-075									Y																				Y		
		SGS AXYS MLA-075	MLA-075		Y								Y										Y										Y	
	Penicillin G	EPA 1694	MLA-075									Y																				Y		
		SGS AXYS MLA-075	MLA-075		Y								Y										Y										Y	
Penicillin V	EPA 1694	MLA-075									Y																				Y			
	SGS AXYS MLA-075	MLA-075		Y								Y										Y										Y		
Prednisolone	SGS AXYS MLA-075	MLA-075		Y																		Y												
Prednisone	SGS AXYS MLA-075	MLA-075		Y																		Y												
Promethazine	SGS AXYS MLA-075	MLA-075		Y																		Y												
Propoxyphene	SGS AXYS MLA-075	MLA-075		Y																		Y												
Propranolol	SGS AXYS MLA-075	MLA-075		Y																		Y												
Ranitidine	EPA 1694	MLA-075									Y																				Y			
	SGS AXYS MLA-075	MLA-075		Y								Y										Y									Y			
Roxithromycin	EPA 1694	MLA-075									Y																				Y			
	SGS AXYS MLA-075	MLA-075		Y								Y										Y										Y		
Sarafloxacin	EPA 1694	MLA-075									Y																					Y		
	SGS AXYS MLA-075	MLA-075		Y								Y										Y										Y		
Sertraline	SGS AXYS MLA-075	MLA-075		Y																		Y												
Simvastatin	SGS AXYS MLA-075	MLA-075		Y																		Y												
Sulfachloropyridazine	EPA 1694	MLA-075									Y																				Y			
	SGS AXYS MLA-075	MLA-075		Y								Y										Y										Y		
Sulfadiazine	EPA 1694	MLA-075									Y																					Y		
	SGS AXYS MLA-075	MLA-075		Y								Y										Y										Y		
Sulfadimethoxine	EPA 1694	MLA-075									Y																					Y		
	SGS AXYS MLA-075	MLA-075		Y								Y										Y										Y		

Accreditation Scope																																		
SGS AXYS Analytical Services Ltd. file ref.: ACC-101 Rev. 40																																		
				Serum	Solids								Tissue					Urine	Water	Water, Non-Potable														
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **
	Sulfamerazine	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Sulfamethazine	EPA 1694	MLA-075										Y											Y							Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Sulfamethizole	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Sulfamethoxazole	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Sulfanilamide	EPA 1694	MLA-075										Y											Y								Y		
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Sulfathiazole	EPA 1694	MLA-075										Y												Y						Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Tetracycline (TC)	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Theophylline	SGS AXYS MLA-075	MLA-075		Y																			Y										
	Thiabendazole	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Trenbolone	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Trenbolone acetate	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Triamterene	SGS AXYS MLA-075	MLA-075		Y																		Y											
	Triclocarban	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
	Triclosan	EPA 1694	MLA-075										Y																		Y			
		SGS AXYS MLA-075	MLA-075		Y																		Y											
Trimethoprim	EPA 1694	MLA-075										Y											Y							Y				
	SGS AXYS MLA-075	MLA-075		Y																		Y												
Tylosin	EPA 1694	MLA-075										Y																		Y				
	SGS AXYS MLA-075	MLA-075		Y																		Y												
Valsartan	SGS AXYS MLA-075	MLA-075		Y																		Y												
Verapamil	SGS AXYS MLA-075	MLA-075		Y																		Y												
Virginiamycin	EPA 1694	MLA-075										Y																		Y				
	SGS AXYS MLA-075	MLA-075		Y																		Y												
Warfarin	EPA 1694	MLA-075										Y																		Y				
	SGS AXYS MLA-075	MLA-075		Y																		Y												
Targeted Metabolites	11, 14, 17-eicosatrienoic acid (eicosatrienoic acid)	SGS AXYS MLM-001	MLM-001											Y																				
	11, 14-eicosadienoic acid	SGS AXYS MLM-001	MLM-001											Y																				
	3-hydroxytyrosine	SGS AXYS MLM-001	MLM-001	Y										Y								Y												
	Acetylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y								Y												
	Acetylmethionine	SGS AXYS MLM-001	MLM-001	Y										Y								Y												
	Alanine	SGS AXYS MLM-001	MLM-001	Y										Y								Y												
	alpha-Aminoadipic acid	SGS AXYS MLM-001	MLM-001	Y										Y								Y												
	Arginine	SGS AXYS MLM-001	MLM-001	Y										Y								Y												
	Asparagine	SGS AXYS MLM-001	MLM-001	Y										Y								Y												
	Aspartate	SGS AXYS MLM-001	MLM-001	Y										Y								Y												
	Asymmetric dimethylarginine	SGS AXYS MLM-001	MLM-001	Y										Y								Y												
	Butenylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y								Y												
	Butyrylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y								Y												
	C22:5 ISOMER 1 (tentatively all-cis-4, 8, 12, 15, 19-docosapentaenoic acid)	SGS AXYS MLM-001	MLM-001											Y																				
	C22:5 ISOMER 2 (all-cis-7,10,13,16,19-docosapentaenoic acid (DPA)	SGS AXYS MLM-001	MLM-001											Y																				
	C22:5 ISOMER 3 (tentatively all-cis-4, 7, 10, 13, 16-docosapentaenoic acid)	SGS AXYS MLM-001	MLM-001											Y																				
	Carnitine	SGS AXYS MLM-001	MLM-001	Y										Y								Y												
	Carnosine	SGS AXYS MLM-001	MLM-001	Y										Y								Y												
	chenodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y										Y								Y												
	cholic acid	SGS AXYS MLM-001	MLM-001	Y										Y								Y												
	Citrulline	SGS AXYS MLM-001	MLM-001	Y										Y								Y												
	Creatinine	SGS AXYS MLM-001	MLM-001	Y										Y								Y												
	Decadienylcarnitine	SGS AXYS MLM-001	MLM-001	Y										Y								Y												
	decanoic acid (capric acid)	SGS AXYS MLM-001	MLM-001											Y																				

Accreditation Scope																																		
SGS AXYS Analytical Services Ltd. file ref.: ACC-101 Rev. 40																																		
				Serum	Solids							Tissue	Urine	Water	Water, Non-Potable																			
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	ANAB ISO 17025	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE *	Maine DOH	Pennsylvania DEP	ANAB ISO 17025	ANAB DoD **
	Decanoylcarnitine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Decenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	deoxycholic acid	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	docosahexaenoic acid (DHA)	SGS AXYS MLM-001	MLM-001													Y						Y												
	docosatetraenoic acid (adrenic acid)	SGS AXYS MLM-001	MLM-001													Y						Y												
	Dodecanedioylcarnitine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Dodecanoylcarnitine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Dodecenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Dopamine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	eicosapentaenoic acid (EPA)	SGS AXYS MLM-001	MLM-001													Y						Y												
	Eicosatetraenoic acid (arachidonic acid)	SGS AXYS MLM-001	MLM-001													Y						Y												
	eicosatrienoic acid (dihomo-γ-linolenic acid)	SGS AXYS MLM-001	MLM-001													Y						Y												
	Glutaconylcarnitine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Glutamate	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Glutamine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Glutaryl carnitine (Hydroxyhexanoylcarnitine)	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Glycine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	glycochenodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	glycocholic acid	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	glycodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Hexadecadienylcarnitine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	hexadecanoic acid (palmitic acid)	SGS AXYS MLM-001	MLM-001													Y						Y												
	Hexadecanoylcarnitine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	hexadecenoic acid (palmitoleic acid)	SGS AXYS MLM-001	MLM-001													Y						Y												
	Hexadecenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Hexanoylcarnitine (Fumaryl carnitine)	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Hexenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Hexose (sum isomers)	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Histamine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Histidine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Hydroxyhexadecadienylcarnitine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Hydroxyhexadecanoylcarnitine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Hydroxyhexadecenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Hydroxybutyrylcarnitine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Hydroxyoctadecenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Hydroxyproline	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Hydroxypropionylcarnitine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Hydroxysphingomyeline C14:1	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Hydroxysphingomyeline C16:1	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Hydroxysphingomyeline C22:1	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Hydroxysphingomyeline C22:2	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Hydroxysphingomyeline C24:1	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Hydroxytetradecadienylcarnitine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Hydroxytetradecenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Hydroxyvaleryl carnitine (Methylmalonylcarnitine)	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Isoleucine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Kynurenine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Leucine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	lithocholic acid	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	Lysine	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	lysoPhosphatidylcholine acyl C14:0	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	lysoPhosphatidylcholine acyl C16:0	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	lysoPhosphatidylcholine acyl C16:1	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	lysoPhosphatidylcholine acyl C17:0	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	lysoPhosphatidylcholine acyl C18:0	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	lysoPhosphatidylcholine acyl C18:1	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	lysoPhosphatidylcholine acyl C18:2	SGS AXYS MLM-001	MLM-001	Y												Y						Y												
	lysoPhosphatidylcholine acyl C20:3	SGS AXYS MLM-001	MLM-001	Y												Y						Y												

Accreditation Scope				Serum		Solids		Tissue		Urine		Water		Water, Non-Potable	
SGS AXYS Analytical Services Ltd. file ref.: ACC-101 Rev. 40															
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	Maine DOH	ANAB ISO 17025	ANAB DoD **
	lysoPhosphatidylcholine acyl C20:4	SGS AXYS MLM-001	MLM-001	Y											
	lysoPhosphatidylcholine acyl C24:0	SGS AXYS MLM-001	MLM-001	Y											
	lysoPhosphatidylcholine acyl C26:1	SGS AXYS MLM-001	MLM-001	Y											
	lysoPhosphatidylcholine acyl C28:0	SGS AXYS MLM-001	MLM-001	Y											
	lysoPhosphatidylcholine acyl C28:1	SGS AXYS MLM-001	MLM-001	Y											
	Methionine	SGS AXYS MLM-001	MLM-001	Y											
	Methioninesulfoxide	SGS AXYS MLM-001	MLM-001	Y											
	Methylglutaryl carnitine	SGS AXYS MLM-001	MLM-001	Y											
	Nitrotyrosine	SGS AXYS MLM-001	MLM-001	Y											
	Nonaylcarnitine	SGS AXYS MLM-001	MLM-001	Y											
	octadecadienoic acid (linoleic acid)	SGS AXYS MLM-001	MLM-001												
	Octadecadienyl carnitine	SGS AXYS MLM-001	MLM-001	Y											
	octadecanoic acid (stearic acid)	SGS AXYS MLM-001	MLM-001												
	Octadecanoyl carnitine	SGS AXYS MLM-001	MLM-001	Y											
	octadecatrienoic acid (γ-linolenic acid)	SGS AXYS MLM-001	MLM-001												
	Octadecenoyl carnitine	SGS AXYS MLM-001	MLM-001	Y											
	Octanoyl carnitine	SGS AXYS MLM-001	MLM-001	Y											
	Ornithine	SGS AXYS MLM-001	MLM-001	Y											
	Phenylalanine	SGS AXYS MLM-001	MLM-001	Y											
	Phenylethylamine	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C30:0	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C30:1	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C30:2	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C32:1	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C32:2	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C34:0	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C34:1	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C34:2	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C34:3	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C36:0	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C36:1	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C36:2	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C36:3	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C36:4	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C36:5	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C38:0	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C38:1	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C38:2	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C38:3	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C38:5	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C38:6	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C40:1	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C40:2	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C40:3	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C40:4	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C40:5	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C40:6	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C42:0	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C42:1	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C42:2	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C42:3	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C42:4	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C42:5	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C44:3	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C44:4	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C44:5	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine acyl-alkyl C44:6	SGS AXYS MLM-001	MLM-001	Y											
	Phosphatidylcholine diacyl C24:0	SGS AXYS MLM-001	MLM-001	Y											

Accreditation Scope																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										

Accreditation Scope				Serum		Solids		Tissue		Urine	Water	Water, Non-Potable	
SGS AXYS Analytical Services Ltd. file ref.: ACC-101 Rev. 40													
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CALA	CALA	California DPH	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB ISO 17025
	Taurine	SGS AXYS MLM-001	MLM-001	Y									
	taurochenodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y									
	taurocholic acid	SGS AXYS MLM-001	MLM-001	Y									
	taurodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y									
	tauroolithocholic acid	SGS AXYS MLM-001	MLM-001	Y									
	taurooursodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y									
	Tetradecadienylcarnitine	SGS AXYS MLM-001	MLM-001	Y									
	tetradecanoic acid (myristic acid)	SGS AXYS MLM-001	MLM-001										
	Tetradecanoylcarnitine	SGS AXYS MLM-001	MLM-001	Y									
	Tetradecenoylcarnitine	SGS AXYS MLM-001	MLM-001	Y									
	Threonine	SGS AXYS MLM-001	MLM-001	Y									
	Tiglylcarnitine	SGS AXYS MLM-001	MLM-001	Y									
	Total dimethylarginine	SGS AXYS MLM-001	MLM-001	Y									
	Tryptophan	SGS AXYS MLM-001	MLM-001	Y									
	Tyrosine	SGS AXYS MLM-001	MLM-001	Y									
	ursodeoxycholic acid	SGS AXYS MLM-001	MLM-001	Y									
	Valerylcarnitine	SGS AXYS MLM-001	MLM-001	Y									
	Valine	SGS AXYS MLM-001	MLM-001	Y									
TBBPA	Tetrabromobisphenol A	SGS AXYS MLA-079	MLA-079	Y									
TOP	Perfluorobutanesulfonate (PFBS)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorobutanoate (PFBA)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorodecanesulfonate (PFDS)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorodecanoate (PFDA)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorododecanesulfonate (PFDoS)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorododecanoate (PFDoA)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluoroheptanesulfonate (PFHpS)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluoroheptanoate (PFHpA)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorohexanesulfonate (PFHxS)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorohexanoate (PFHxA)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorononanesulfonate (PFNS)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorononanoate (PFNA)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorooctanesulfonate (PFOS)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorooctanoate (PFOA)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluoropentanesulfonate (PFPeS)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluoropentanoate (PFPeA)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorotetradecanoate (PFTeDA)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluorotridecanoate (PFTrDA)	SGS AXYS MLA-111	MLA-111		Y								
	Perfluoroundecanoate (PFUnA)	SGS AXYS MLA-111	MLA-111		Y								
Note *	Analysis of pesticides and PCBs in non-potable water samples by AXYS method MLA-007, with the exception of NPDES or State permitted discharges and Stormwater applications, may fall within the scope of Washington State Department of Ecology solids matrix accreditation, subject to approval of the Ecology Project Manager.												
Note **	PFAS by LC-MS/MS compliant with US DoD QSM 5.1 table B-15												

Legend

Y	Accreditation scope
BFR	Brominated flame retardants (non-PBDPE)
BPA and mPE	Bisphenol A and mono-Phthalate Esters
HBCDD	Hexabromocyclododecane
OC Pesticides	Organochlorine Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PBDPE	Polybrominated diphenylethers
PCB	Polychlorinated Biphenyls
PCDDF	Polychlorinated dibenzodioxins/furans
PFAS	Per- and Polyfluoroalkyl Substances
PPCP	Pharmaceutical and Personal Care Products
TBBPA	Tetrabromobisphenol A
TOP	Total Oxidizable Precursors
California DPH	California Department of Public Health, Lab ID 2911
Florida DOH	Florida Department of Health, Lab ID E871007, (NELAC Standard)
Pennsylvania DEP	Pennsylvania Department of Environmental Protection
Minnesota DOH	Minnesota Department of Health, Lab ID 232-999-430, (NELAC Standard)
New Jersey DEP	New Jersey Department of Environmental Protection, Lab ID CANA005, (NELAC Standard)
New York DOH	New York Department of Health, Lab ID 11674, (NELAC Standard)
Washington DE	Washington Department of Ecology, Lab ID C404
Virginia DGS	Virginia Department of General Services, Division of Consolidated Laboratory Services, Lab ID 460224, (NELAC Standard)
Maine DOH	Maine Center for Disease Control and Prevention, Department of Health and Human Services, Lab ID CN00003

ANAB DoD ANSI-ASQ National Accreditation Board, certificate ADE-1861, (US DoD QSM 5.1 Standard)



CALA Canadian Association for Laboratory Accreditation Inc., Lab ID A2637, (ISO/IEC 17025:2005 Standard)



ANAB ISO 17025 ANSI-ASQ National Accreditation Board, certificate ADE-1861.01, (ISO/IEC 17025:2005 Standard)



Appendix C

Beneficial Water User Survey

APPENDIX C: BENEFICIAL WATER USER SURVEY

SUBMITTED TO:

Snohomish County Airport
3220 100th Street SW, Suite A
Everett, WA 98204-1303

BY:

Shannon & Wilson
400 N. 34th Street, Suite 100
Seattle, WA 98103

(206) 632-8020

www.shannonwilson.com

BENEFICIAL WATER USER SURVEY

Former Fire Training Pit

SNOHOMISH COUNTY AIRPORT, EVERETT, WASHINGTON

Submitted To: Snohomish County Airport
3220 100th Street SW, Suite A
Everett, WA 98204-1303
Attn: Mr. Andrew Rardin

Subject: BENEFICIAL WATER USER SURVEY, FORMER FIRE TRAINING PIT,
SNOHOMISH COUNTY AIRPORT, EVERETT, WASHINGTON

Shannon & Wilson prepared this report and participated in this project as a consultant to Snohomish County Public Works under our on-call contract for geotechnical and environmental services (Agreement No. OCC19/1-7.8[BG]). Our scope of services was specified in Task No. TA 5, approved on April 20, 2022.

This report summarizes results of the Beneficial Water Users Survey at the former Fire Training Pit at the Snohomish County Airport, also known as Paine Field, in Everett, Washington.

We appreciate the opportunity to be of service to you on this project. If you have questions concerning this report, or we may be of further service, please contact us.

Sincerely,

SHANNON & WILSON



Digitally signed by Paul L.
Van Horne
Date: 2023.05.01
16:13:41 -07'00'

Paul L. Van Horne, LHG
Associate

MJS:PVH/pvh

EXECUTIVE SUMMARY

This report provides a summary of beneficial users of groundwater and surface water in the vicinity of a former Fire Training Pit (FTP) located at Paine Field/Snohomish County Airport (SCA), Everett, Washington.

We performed a search of publicly available literature and databases and performed interviews to gather information regarding potential groundwater and surface water beneficial users. A minimum search radius of 1 mile from the FTP was selected.

Groundwater User Survey

We identified two abandoned or unused water supply wells and no active groundwater rights within the search radius:

- Well ID 22B01: A reportedly abandoned production well that is located approximately 0.5 mile to the northeast of the FTP.
- Well ID 28B01: An irrigation well that may still exist but is reportedly unused and is located on the Harbour Pointe Golf Course approximately 0.95 mile to the southwest of the FTP.

Surface Water User Survey

Surface water within the search radius consisted of several creeks, wetlands, and stormwater detention ponds. We did not identify active surface water rights within the search radius.

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Attachments

Attachment A: Log for Well 22B01

Attachment B: Log for Well 28B01

Important Information

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ACRONYMS

bgs	below ground surface
CDM	Camp Dresser & McKee Inc.
DOH	Washington State Department of Health
Ecology	Washington State Department of Ecology
FTP	Fire Training Pit
HDPE	high-density polyethylene
GIS	geographic information system
NAVD88	North American Vertical Datum of 1988
NGVD29	National Geodetic Vertical Datum of 1929
NWIS	National Water Information System
PFAS	per- and polyfluoroalkyl substances
Qva	Vashon Advance Outwash
Qvt	Vashon Till
SCA	Snohomish County Airport
SCOPI	Snohomish County online property information
SR	State Route
SWAP	source water assessment program
USGS	U. S. Geological Survey

1 INTRODUCTION

This report summarizes the procedures used in and results of our beneficial water user survey. The purpose of the survey was to identify current users of groundwater and surface water within one mile of the FTP at the SCA, also known as Paine Field, in Everett, Washington.

1.1 Site Location and Description

The FTP is located adjacent to the northwest boundary of Taxiway K-5 at the SCA. A vicinity map is provided as Figure 1. The FTP was used for fire training purposes and was an approximately 40-foot by 80-foot oval earthen depression about 1 to 2 feet deep (Camp Dresser & McKee Inc. [CDM], 2007). In 2006, as part of environmental remediation activities, the FTP was excavated and backfilled to match the surrounding grade. The location of the FTP and surrounding area are currently vegetated (grass).

In 2018, CDM Smith Inc. completed an investigation in the FTP vicinity to evaluate soil and groundwater for the presence of per- and polyfluoroalkyl substances (PFAS) potentially associated with the use of aqueous film-forming foam during past firefighting training activities. Shannon & Wilson has undertaken a PFAS-related environmental investigation of the FTP vicinity and those activities are reported in the 2023 Data Report (Shannon & Wilson, 2023).

1.2 Purpose and Scope of Services

The purpose of this beneficial user survey was to identify nearby points of beneficial uses of groundwater and surface water (e.g., for drinking water, irrigation, or stock watering).

To accomplish this objective, our scope of services included a search of publicly available literature and databases and interview for information regarding locations of groundwater and surface water beneficial use. A minimum search radius of 1 mile from the FTP was selected.

Shannon & Wilson has prepared the enclosed, "Important Information About Your Environmental Site Assessment/Evaluation Report," to assist you and others in understanding our report.

2 LOCAL GEOLOGY AND HYDROGEOLOGY

The ground surface in the immediate vicinity of the FTP has an approximate elevation of 566 feet North American Vertical Datum of 1988 (NAVD88), and the surface slopes gently down (approximately 2%) to the west over about 400 feet, to a point where a break in slope occurs (Figure 2). From this point, ground slopes down more steeply (approximately 33%) to the west over a lateral distance of about 150 feet and vertical drop of about 50 feet, to where a stormwater detention pond is present on the SCA property, near the Mukilteo Speedway/State Route (SR) 525.

2.1 Site Geology

Geotechnical investigations were performed in 1998 in the FTP vicinity (AGI Technologies, 1998). Based on these investigations and additional explorations performed in 2018 by CDM Smith (CDM Smith, 2018) and in 2022 by Shannon & Wilson (Shannon & Wilson, 2023), the vicinity of the FTP is underlain by fill soils ranging in thickness from about 12 feet below ground surface (bgs) to possibly as much as about 44 feet bgs. Fill soils appears to become thicker to the west of the FTP until reaching the steep downslope prior to the stormwater detention pond. The fill soils are underlain by Vashon Till (Qvt) and Vashon Advance Outwash (Qva).

The following soil units are interpreted as being present in the FTP vicinity:

- **Upper Fill:** The upper fill soils, noted by CDM Smith to extend between approximately 16 and 24 feet bgs, were interpreted to consist of reworked native glacial till, possibly mixed with construction rubble and pieces of vegetation. CDM Smith described the upper fill to generally consist of very loose to loose, moist to wet, silty sand with some gravel and cobbles and occasional organics and wood.
- **Lower Fill:** The lower fill soils were noted by CDM Smith to extend to depths of approximately 19 to 44 feet bgs. These soils were described as generally consisting of loose to medium dense, saturated, silty sand with some gravel and cobbles, but with fewer organics and wood than in the upper fill.
- **Vashon Till (Qvt):** This native soil, deposited during the most recent local glaciation, was described by CDM Smith as consisting of dense to very dense, moist to wet, silty sand with some gravel and cobbles and occasional lenses of clean sand. CDM Smith noted it was encountered by their explorations immediately below the lower fill.

Weathered (looser) Qvt was observed with a thickness of up to 13 feet underlain by competent (dense/stiff) Qvt. The weathered Qvt has been subglacially reworked, making it not only looser, but also of higher permeability and water content. During direct-push drilling by Shannon & Wilson in 2022 (Shannon & Wilson, 2023), the surface of competent Qvt was subjectively designated as the depth at which refusal was

encountered, unless obvious contraindications existed, in accordance with standards of practice. Because distinguishing between weathered and competent till using soil characteristics alone is challenging (they appear very similar in soil samples), the subjective designation further aids to identify the thickness of the weathered Qvt present on top of competent Qvt at boring locations.

Explorations by Shannon & Wilson in 2022 indicate that the surface of the Qvt may slope downwards more steeply than the topographic surface to the west of the FTP, resulting in greater depth of fill soils to the west of the FTP. This trend is interrupted by a steep, apparently human-made, topographic downslope starting at 400 feet west of the FTP. On the west side of the detention pond, the Qvt may be as shallow as about 12 feet bgs (boring FP-MW5, in Figure 2).

The full thickness of the Qvt has reportedly not been fully penetrated by explorations in the vicinity of the FTP. The Qvt appears to extend down to at least elevation of 461 feet NAVD88 (105 feet depth bgs) at boring FP-MW4 within the footprint of the FTP.

- **Vashon Advance Outwash (Qva)** and older units: Qva has been identified at sites on and near the SCA, typically consisting of sand with varying amounts of silt and gravel (Newcomb, 1952; Thomas and others, 1997; Landau Associates, 2019). Approximately 3,000 to 4,600 feet southeast of the FTP, in the vicinity of the TECT Aerospace Leasehold site, a series of relatively deep (150 to 152 feet) environmental wells encountered what has been interpreted as Qva deposits (primarily clean to silty sands) below the Qvt (Landau Associates, 2019).

Landau Associates interpreted the top of the Qva soils at these locations to be at approximately elevation 536 to 507 feet (vertical datum not stated, assumed to be NAVD88). Thomas and others (1997) postulated that the Qva deposits may be on the order of 250 feet thick in the SCA vicinity and are perched on fine-grained sediments (transitional beds, Qtb, generally a confining layer) above roughly elevation 200 feet. Thomas and others (1997) indicate that undifferentiated sediments (Qu) are present beneath the Qtb, with the Qu mostly being an aquifer.

2.2 Groundwater

2.2.1 Near-Surface Perched Groundwater

Competent Qvt is typically an aquitard and groundwater has been encountered perched on the competent Qvt (within the weathered Qvt and fill soils) at the FTP site. Although, groundwater may exist within relatively more permeable zones of the Qvt unit. Boring FP-MW4 was advanced through approximately 75 feet of competent Qvt (105 feet total depth) within the footprint of the FTP. Groundwater was not observed within the competent Qvt unit at boring FP-MW4.

Six monitoring wells in the FTP vicinity (FP-MW1 to FP-MW6, Figure 2) were installed in 2022 to allow for measurement of the perched groundwater levels, as part of this Data Report. Groundwater levels were measured approximately quarterly for a full year (June 2022 through March 2023). Seasonal fluctuations ranged from approximately 0.6 to 5.9 feet.

Based on measurements from the six monitoring wells, the groundwater gradient for near-surface perched groundwater is interpreted to be generally westerly from the FTP and the direction was relatively consistent over the monitoring events. Groundwater contours and gradients from the monitoring events are presented in the Data Report by Shannon & Wilson (2023).

2.2.2 Deeper Groundwater

At the FTP site, the presence of one or more aquifers below the Qvt in the Qva unit has not been directly confirmed but is anticipated, based on logs of other deep wells drilled on and in the vicinity of the SCA. A Qva aquifer was identified by deep monitoring wells at the TECT Aerospace Leasehold site, about 0.6 mile southeast of the FTP. There, the Qva potentiometric surface is at approximately 468 feet elevation, which corresponds to 98 feet bgs at the FTP, with the Qva groundwater gradient being reportedly to the north/northeast (Landau Associates, 2019). This groundwater level is over 100 feet higher than that estimated by U.S. Geological Survey (USGS) authors Thomas and others (1997) and Newcomb (1952) for the Qva aquifer in the SCA vicinity (about elevation 340 to 350 feet, corresponding to 226 to 216 feet bgs at the FTP), based on groundwater levels measured in deep wells in areas surrounding the SCA. Therefore, it appears multiple aquifers may exist within the layer that has been described as Qva. Alternatively, some of the groundwater elevations reported for the Qva by these USGS authors may in fact be more representative of the underlying Qu aquifer system, for at least some of the relatively deep wells identified by these authors in the SCA vicinity.

Newcomb (1952) and Thomas and others (1997) postulated that the gradient in the Qva aquifer is generally to the northwest or west/southwest, respectively, in the vicinity of the FTP. This implies that the Qva aquifer gradient would likely be influenced by the presence of deeply incised drainages such as Big Gulch Creek (Figure 1), which is located west/northwest of the FTP.

As described in the Shannon & Wilson Data Report (2023), boring FP-MW4 was advanced to 105 feet bgs to search for indications of groundwater within the competent Qvt or in the deeper Qva unit. Competent Qvt was observed at 30 feet bgs to 105 feet bgs. The Qva unit was not encountered. Indications of deeper groundwater, such as saturated soil, were not encountered between 30 to 105 feet bgs.

2.3 Surface Water

Surface water bodies within 1 mile of the FTP include stormwater detention ponds and small streams (creeks) that drain to the Puget Sound, which is approximately 1.6 miles to the northwest.

We observed groundwater seepage daylighting on the slope to the west of the FTP at approximate elevations of 516 to 519 feet NAVD88 in the area roughly delineated in Figure 2. The elevations of the seeps are consistent with the interpreted approximate perched groundwater level contours, suggesting that the seepage was from perched groundwater. The seeps were located approximately 530 feet to the west of the FTP and hydraulically downgradient. The seeps drain into the stormwater detention pond at the base of the slope.

Stormwater runoff from the vicinity of the FTP is collected in catch basins and piped to a stormwater detention pond located at the base of the slope to the west of the FTP and possibly to the vegetated area to the northwest of the FTP (Figure 2). The detention pond has an outlet pipe that acts as a spillway under the Mukilteo Speedway and discharges to Big Gulch Creek on the other side of the speedway. Big Gulch Creek drains to the Puget Sound approximately two miles downstream to the northwest.

3 RESEARCH

Shannon & Wilson performed interviews and a literature and database review, with the goal of identifying beneficial users of groundwater and surface water located within an approximately one-mile radius of the FTP.

3.1 Data Sources

In addition to the geotechnical and environmental reports described in Section 2 above, we reviewed information from multiple other sources, described below. Locations and other information provided in these data sources should be considered approximate.

3.1.1 Interviews

We conducted the following interviews as part of our research:

- We contacted Washington State Department of Ecology (Ecology) personnel (Ms. Michelle Curtis) on December 19, 2022, to confirm that the Ecology well log viewer and water rights search online databases were up to date.

- We contacted SCA personnel (Mr. Andrew Rardin) on January 11, 2023, to enquire if he was aware of the following on or near the SCA site:
 - Any existing water rights for groundwater or surface water use.
 - Any existing water supply wells or points of use for springs/surface water.We also enquired about the purpose of the two high-density polyethylene (HDPE) pipes we observed discharging to the slope west of the FTP.
- We contacted the Harbour Point Golf Course on January 16, 2023, to ask them about water supply wells they may have. We left a message with the receptionist for the general manager and the superintendent, requesting that one of them call us back.
- We contacted Washington State Department of Health (DOH) personnel (Ms. Nikki Guillot) on January 19, 2023, to see if the DOH had identified Group A or B water sources other than those presented by the source water assessment program (SWAP) mapping application.

3.1.2 Databases and Literature Review

As part of our search for potential groundwater and surface water users, we reviewed information from the following sources, in addition to the geotechnical/environmental reports referenced in Section 2:

- Subsurface exploration logs identified by the Washington Geological Survey portal (Washington Geological Survey, 2023). This database obtains information from public agencies and is not considered comprehensive. We searched the portal for water wells and other soil borings within the search area.
- DOH listings of Group A and B public water systems identified in the DOH Source Water Assessment Program online map of public water supply sources (DOH, 2023).
- The USGS National Water Information System (NWIS) website (USGS, 2023). This website contains information regarding water supply wells and resource protection wells identified and, in some cases, measured by, the USGS. We cross-referenced the information presented on this website to information presented in other USGS resources, including Ground-Water Resources of Snohomish County, Washington (Newcomb, 1952) and The Ground-Water System and Ground-Water Quality in Western Snohomish County, Washington (Thomas and others, 1997).
- The Everett geographic information system (GIS) website, which includes some information regarding borings and water wells (Everett, Wash., 2023).
- The Snohomish County Drainage Inventory and Mukilteo GIS websites, which provides information regarding stormwater facilities (Snohomish County, Wash. Assessor, 2023).
- The Snohomish County online property information (SCOPI) interactive map (Snohomish County, Wash., 2023), which provides information regarding property owners and parcel numbers.

- The Ecology water rights search website, available through Ecology's Water Rights Tracking interactive mapping system (Ecology, 2023a). This website provides information regarding surface water and groundwater rights.
- The Ecology well report viewer website (Ecology, 2023b), which contains logs of wells, typically submitted by well drillers. We searched this website for water supply well logs in and near the 1-mile-radius search area. We cross-referenced the information provided on this website to information from other sources, e.g., the USGS NWIS website, the reports by Newcomb (1952) and Thomas and others (1997), the Ecology water rights search website, and the City of Everett GIS website.

3.2 Results and Discussion

3.2.1 Interviews

- Mr. Rardin (SCA) reported that SCA did not have water rights and did not use groundwater or surface water for beneficial uses. He noted that the only water supply wells in the vicinity that he was aware of were at the Harbour Pointe Golf Course (an unused irrigation well) and possibly another well on 92nd Street SW. He also described the purpose of the two HDPE pipes that daylight on the slope west of the FTP as being to transmit stormwater collected from upstream SCA taxi lanes, aprons, and roads.
- Ms. Curtis (Ecology) said that Ecology well logs are usually updated in that database within about 24 hours of receipt of new information, and that the Ecology water rights database was typically updated within about 48 hours.
- Harbour Pointe Golf Course personnel did not return our call.
- Ms. Guillot (DOH) confirmed that the SWAP map was current and that DOH had not identified any Group A or B public water sources within the vicinity of the 1-mile radius search area.

3.2.2 Databases and Literature

The Snohomish County Drainage Inventory and Mukilteo GIS websites identify the water from the detention pond at the base of the slope west of the FTP and east of SR 525 as discharging to Big Gulch Creek.

Newcomb (1952) identified a water supply well on the SCA, drilled circa 1938 and reportedly since abandoned (well 22B01 in Table 1). The NWIS identified a well in about the same general location as Newcomb, but with a slightly different surface elevation and depth; in our opinion, it is likely that these represent the same well. Soils were described as water bearing from 240 feet to 320 feet bgs (about elevation 340 feet to 243 feet above mean sea level), and it appears that Newcomb may have estimated the groundwater depth to be 240 feet bgs. The well terminated in or below the Qtb, possibly in the Qu, and there is not a

record of the casing depth or screen/perforation depth (if any) on Newcomb's summary log. The summary well log is included in Attachment A.

We identified one water supply well that may still exist within 1 mile of the FTP, on the Harbour Pointe Golf Course (well 28B01 in Table 1 and Figure 3). It is reportedly unused, was drilled to 573 feet bgs, and was completed at 571 feet bgs (Thomas and others, 1997; NWIS). According to these sources, the USGS measured the groundwater level in 1992 at approximately 278 feet bgs (approximately 222 feet National Geodetic Vertical Datum of 1929 [NGVD29], or 225.65 feet NAVD88). Thomas and others (1997) interpreted this well to be completed in the Qu aquifer.

A second water supply well may also still exist on the Harbour Pointe Golf Course, slightly more than one mile from the FTP (well 28C01 in Table 1 and Figure 3), as identified by Thomas and others (1997) and the NWIS. According to these sources, the USGS measured the groundwater level to be approximately 361 feet bgs in 1993 (approximately 139 feet NGVD29, or 142.65 feet NAVD88). Based on the depth (552 feet), it is likely that this is the well identified by the Ecology well log viewer as having been drilled to 552 feet bgs for Golf N.W. Inc. in 1988. The Ecology well log for the Golf N.W. well indicates, apparently incorrectly, that this well is in the southwest quarter of the northeast quarter of Section 16 (of the Public Lands Survey); the edge of that quarter-quarter section is at the edge of the 1-mile search radius. (However, there is no golf course at this map location.) This well log is provided in Attachment B. Thomas and others (1997) interpreted this well to be completed in the Qu aquifer. Although likely outside of the 1-mile search radius, well 28C01 is included in Table 1 and Figure 3 since there is some uncertainty as to the location of the well on the golf course and portions of the golf course are within the 1-mile search radius.

The SWAP mapping application did not identify any Group A or B water supply sources within the 1-mile search radius. The Ecology water rights search website did not identify any surface water or groundwater users within the 1-mile search radius. The Everett GIS website did not identify any water supply wells within the 1-mile search radius.

The only borings within the 1-mile search radius that were characterized as "water wells" by the Washington Geological Survey portal were four monitoring wells located on the SCA site. As these are resource protection wells and not water supply wells, they were not included in the summary of findings in Table 1 or Figure 3.

Creeks and wetlands within the 1-mile radius were identified using the Snohomish County Planning & Development PDS Map Portal, Critical Areas data set. The locations of creeks are shown in Figure 3. Portions of Big Gulch Creek are identified as fish habitat. Portions of

the creeks and other vegetated areas within 1 mile of the FTP are identified as Snohomish County inventoried wetland.

4 CONCLUSIONS

We searched for beneficial users of groundwater and surface water within approximately 1 mile of the FTP.

4.1 Groundwater User Survey

We identified two abandoned or unused water supply wells and no active groundwater rights within the search radius:

- Well ID 22B01: A reportedly abandoned production well that is located approximately 0.5 mile to the northeast of the FTP.
- Well ID 28B01: An irrigation well that may still exist but is reportedly unused and is located on the Harbour Pointe Golf Course approximately 0.95 mile to the southwest of the FTP.

4.2 Surface Water User Survey

Surface water within the search radius consisted of several creeks, wetlands, and stormwater detention ponds. We did not identify active surface water rights within the search radius.

5 REFERENCES

AGI Technologies, 1998, Preliminary geotechnical engineering study, proposed kilo ramp development, Snohomish County Airport, Everett, Washington: Report prepared by AGI Technologies, Bellevue, Wash., project no. 15,512.307, April 23.

Camp Dresser & McKee Inc. (CDM), 2007, Soil remediation summary report, FTP, Snohomish County Airport, Everett, Washington: Report prepared by CDM, Bellevue, Wash., project no. 19947-54348, for Snohomish County Department of Public Works, Everett, Wash., February 26.

CDM Smith Inc., 2018, FTP PFAS investigation, Snohomish County Airport, Everett, Washington: Report prepared by CDM Smith, Bellevue, Wash., for Snohomish County Public Works, Everett, Wash., project no. 19947-230030, October 29.

Everett, Wash., 2023, Map Everett online map viewer: Available: <https://gismaps.everettwa.gov/apps/mapeverettde/>, accessed January 24.

- Landau Associates, 2019, Interim remedial investigation data report, TECT Aerospace Leasehold, Snohomish County Airport/Paine Field, Everett, Washington: Report prepared by Landau Associates, Edmonds, Wash., project no. 0222057.010, for Snohomish County Airport, Everett, Wash., December 31.
- Mukilteo, Wash Surface Water Utility, 2023, Mukilteo stormwater network viewer: Available: <https://mukilteo-city.maps.arcgis.com/apps/webappviewer/index.html?id=854d1c26481c40ebac5c7a2b465ac35f>, accessed January 24.
- Newcomb, R.C., 1952, Ground-water resources of Snohomish County, Washington: U.S. Geological Survey Water-Supply Paper 1135, 133 p., 2 plates, available: <https://pubs.er.usgs.gov/publication/wsp1135>.
- Shannon & Wilson, 2023, Data report, former fire training pit, Snohomish County Airport, Everett, Washington: Report prepared by Shannon & Wilson, Seattle, Wash., project no 102986-005, for Snohomish County Airport, Everett, Wash., May 1.
- Snohomish County, Wash. Assessor, 2023, Snohomish County online property information (SCOPI): Available: <https://snohomishcountywa.gov/5414/Interactive-Map-SCOPI>, accessed January 24.
- Snohomish County, Wash., 2023, Snohomish County drainage inventory interactive map & data: Available: <https://snohomishcountywa.gov/1129/Drainage-GIS>, accessed March 31.
- Thomas, B.E.; Wilkinson, J.M.; and Embrey, S.S., 1997, The ground-water system and ground-water quality in western Snohomish County, Washington: U.S. Geological Survey Water-Resources Investigations Report 96-4312, 218 p., 9 plates, available: <https://pubs.er.usgs.gov/publication/wri964312>.
- U.S. Geological Survey (USGS), 2023, National water information system: mapper: Available: <http://maps.waterdata.usgs.gov/mapper/index.html?state=wa>, accessed January 24.
- Washington Geological Survey, 2023, Geologic information portal: Available: <https://www.dnr.wa.gov/geologyportal>, accessed January 23.
- Washington State Department of Ecology (Ecology), 2023a, Washington State well report viewer: Available: <https://fortress.wa.gov/ecy/waterresources/map/WCLSWebMap/default.aspx>, accessed January 23.

Washington State Department of Ecology (Ecology), 2023b, Water rights search: Available: <https://appswr.ecology.wa.gov/waterrighttrackingsystem/WaterRights/default.aspx>, accessed January 24.

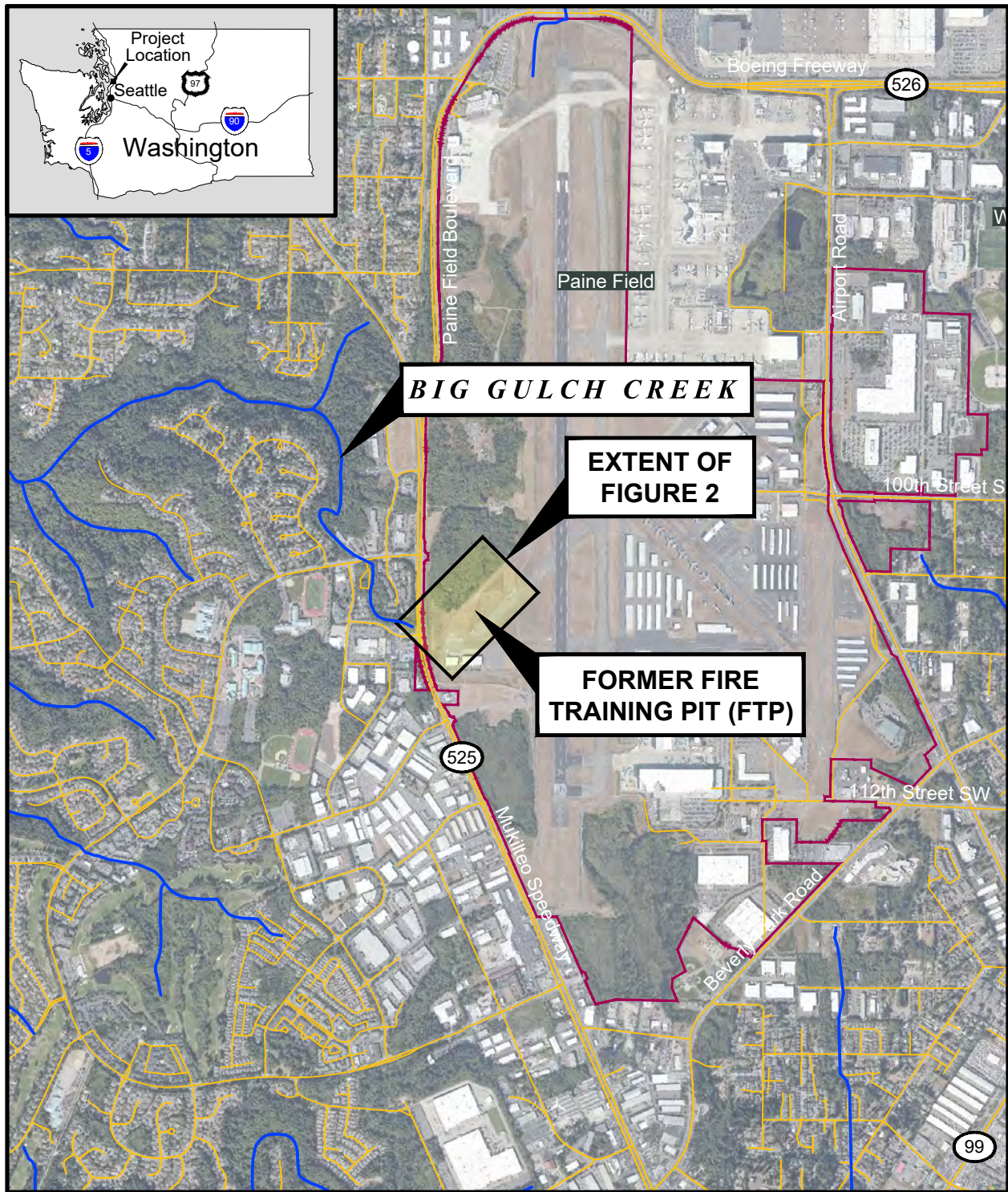
Washington State Department of Health (DOH), Office of Drinking Water, 2023, Source water assessment program (SWAP) mapping application: Available: <https://fortress.wa.gov/doh/swap/index.html>, accessed January 23.

Table 1: Public Records Search Results, Water Supply Wells

												Reported Land Surface Elevation (feet)			Final Casing Position		Groundwater Level		Filter Pack		Screen or Slots		
Reported 1/4 1/4 Section No. ^a	Designation	Public Information Source	Within 1 Mile of Fire Pit?	Reported Address	Parcel No. ^b	Reported Original Owner	Current Parcel Owner ^b	Extrapolated Site Location & Address ^b	Reported DOE Well Tag	Reported Completion Date	Reported Use		Drilled Depth (feet bgs)	Approx. Drilled Elevation (feet)	Approx. Final Casing Bottom Depth ^c (feet bgs)	Approx. Final Casing Bottom Elevation ^c (feet)	Depth (feet bgs)	Approx. Elevation (feet)	Depth (feet bgs)	Approx. Elevation (feet)	Depth (feet bgs)	Approx. Elevation (feet)	
NW NE 22	22B01	Newcomb, 1952; NWIS	Yes	NS	Unclear - multiple possible parcels listed by SCOPI	U.S. Army Air Corps	Potentially Snohomish County - multiple possible owners listed by SCOPI	Potentially Snohomish County Airport	NS	Circa 1938	Abandoned production well	580 (575 NWIS)	547 (528 NWIS)	33 (47 NWIS)	NS		240	~340	NS		NS		Groundwater level likely approximate, based on log description of top of water bearing zone. Abandoned owing to inadequate yield. Location from NWIS. See log (from Newcomb, 1952) in Attachment C-1.
NW NE 28	28B01	Thomas and others, 1997; NWIS	Yes	NS	28042800100200	NS	HNA Harbour Pointe LLC	11817 Harbour Pointe Blvd	NS	NS	Not used (Thomas and others, 1997)	500	573	-73	NS		278	222	NS		NS		Thomas and others, 1997, reports this well as unused.
NE NW 28	28C01	Ecology well logs; Thomas and others, 1997; NWIS	No	NS	28042800100200	Golf N.W. Inc. (Ecology well log)	HNA Harbour Pointe LLC	11817 Harbour Pointe Blvd	NS	11/20/1988 (Ecology)	Irrigation test well (Ecology); Not used (Thomas and others, 1997)	487 (Ecology) or 500	552	-65 (Ecology) or -52	542 (Ecology)	-55 (Ecology)	343 (Ecology); 361	144 (Ecology); 139	None (Ecology)		542 - -42	-65 or -52	Likely the "Golf N.W. Inc." well for which the Ecology well log apparently misreported location as SW NE Section 16. See Ecology well log in Attachment C-2.

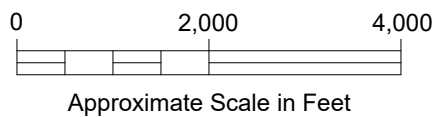
NOTES:

- a Sections are located within Township 28 North, Range 4 East.
- b Parcel numbers and current parcel owners from SCOPI interactive web map, based on recorded or extrapolated address. Extrapolated addresses based on mapped locations in NWIS or Everett GIS data.
- c Final casing depth and elevation estimated based on top of screen, if installed.
- Ecology well log elevations are referenced to MSL, and the Thomas and others (1997) and NWIS elevations are referenced to NGVD29. MSL is approximately the same as NGVD29. The NWIS provides a conversion to NGVD29 elevations to NAVD88 elevations (add 3.65 feet).
- Resource protection and dewatering wells are excluded from this tabulation.
- Approx. = approximate; bgs = below ground surface; Ecology = Washington State Department of Ecology; MSL = mean sea level; NE = northeast; NAVD88 = North American Vertical Datum of 1988; NGVD29 = National Geodetic Vertical Datum of 1929; NS = not stated; NW = northwest; NWIS = U.S. Geological Survey National Water Information System;
- SCOPI = Snohomish County Online Property Information



LEGEND

- Approximate Property Boundary of Snohomish County Airport
- Watercourses (Streams)



Former Fire Training Pit
Snohomish County Airport
Everett, Washington

VICINITY MAP

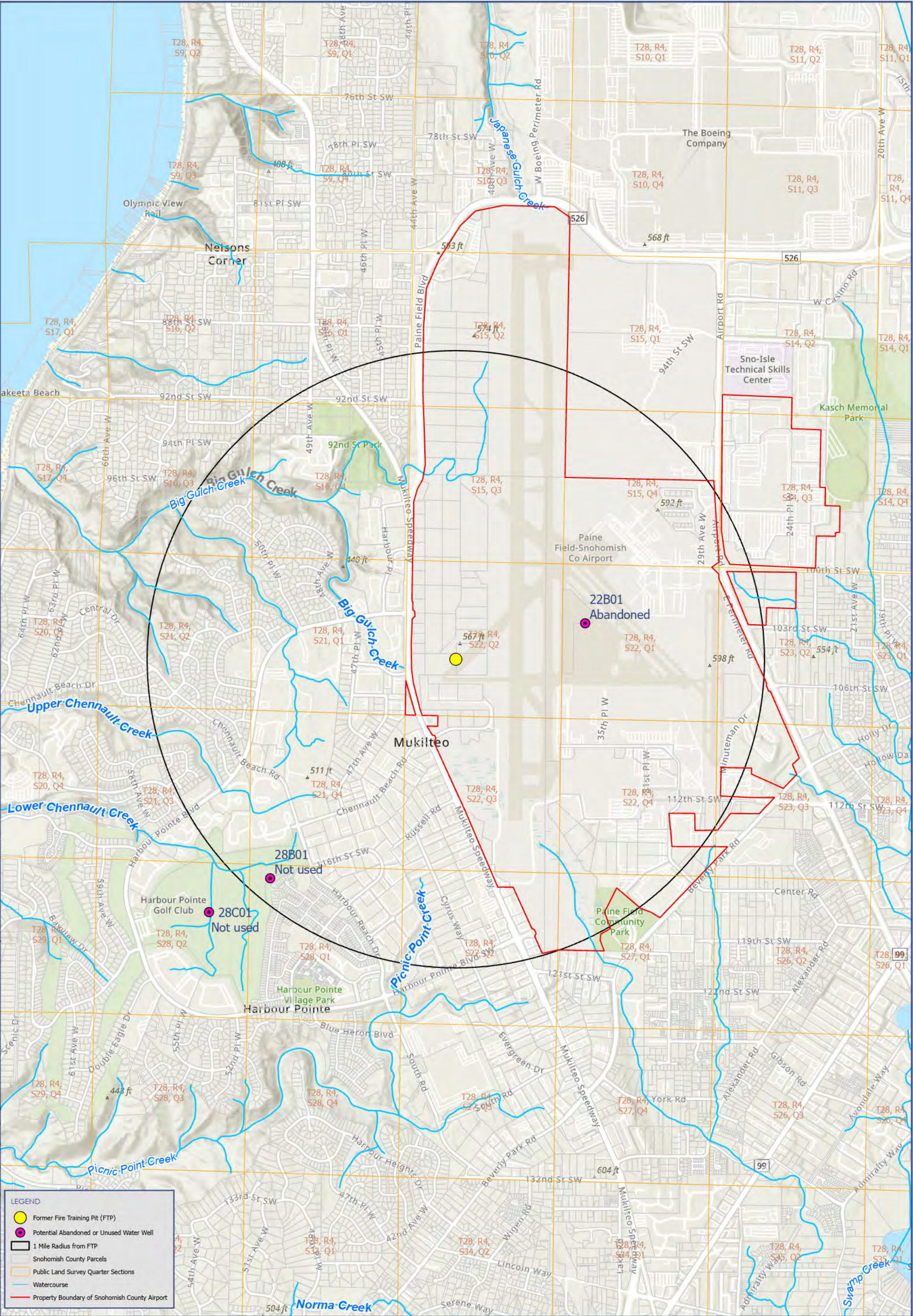
May 2023

102986-005

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 1





Attachment A

Log for Well 22B01

CONTENTS

- Log for Well 22B01 from Newcomb (1952), p. 68.
- Reference: Newcomb, R.C., 1952, Ground-water resources of Snohomish County, Washington: U.S. Geological Survey Water-Supply Paper 1135, 133 p., 2 plates, available: <https://pubs.er.usgs.gov/publication/wsp1135>.

*Logs of representative wells in Snohomish County, Wash.—Continued***Well 27/6-10R2, Alpha Helm**

[About 2 miles southwest of Monroe in "hill swale." Altitude about 150 ft. Drilled by O. Weed. Abandoned "dry hole"]

	Thick- ness (feet)	Depth (feet)		Thick- ness (feet)	Depth (feet)
Till of the Vashon glaciation and associated deposits:			Undifferentiated Tertiary rocks:		
"Hardpan".....	33	33	Shale; "swelling ground".....	0	72
Sand.....	28	61			
Gravel, some water.....	1	62			
"Hardpan".....	4	66			

Well 27/6-14E2, W. R. Paddock

[About 1.5 miles southwest of State reformatory, near right bank of Skykomish River. Altitude about 40 ft. Drilled by C. D. Marks, 1928. No casing set; dry hole]

Till of the Vashon glaciation (?):			Undifferentiated Tertiary rocks—		
"Hardpan".....	30	10	Continued		
Sand; some water.....	2	12	Shale, brown.....	91	443
Undifferentiated Tertiary rocks:			Shale, blue.....	62	505
Basalt, very hard from 162 to			Basalt.....	5	510
168 ft (boulder)?.....	170	182	Shale, blue.....	17	527
Shale, blue and sandy.....	170	352			

Well 27/6-17A1, Robert H. Anderson

[In gorge of Snohomish River at foot of bluff to west and about 1 mile below mouth of Skykomish River. Altitude about 70 ft. Drilled by D. K. Shilling, 1944. Six-inch casing set to develop water at 32 ft]

Alluvium: "Soil," including			Undifferentiated Tertiary rocks:		
"water gravel" just above base.	32	32	Shale, compact, "marine".....	6	170
Undifferentiated Tertiary rocks			Basalt.....	78	254
(?): "Hardpan," with thin					
seams of coal.....	139	170			

Well 27/7-5J1, Don Smith

[About 1.5 miles east of Monroe and just south of Great Northern Railroad. Altitude about 70 ft. Drilled by C. E. Miller, 1945]

Alluvium:			Vashon glacial deposits, etc.—Con.		
Sandy surface soil.....	14	14	Silt and clay.....	8	90
Sand and gravel.....	4	18	Clay, blue, tight, with vegeta-	6	96
Gravel, coarse "iron water".....	7	25	tion seams.....	16	112
Vashon glacial deposits and con-			Sand, dry.....	5	117
temporaneous stream-laid ma-			Sand, insufficient water.....	13	130
terials:			Clay, blue.....	60	190
Gravel, tight and heavy.....	3	28	Sand.....	20	240
Sand, coarse.....	18	46	Sand, with some gravel.....	85	325
Clay.....	1	47	Clay, silty, and fine sand.....	2	327
Clay, sandy, water-bearing.....	13	60	Clay, silty, and coarse sand.....	51	378
Clay.....	18	78			
Clay, fine sand, and peat,					
with gaseous (methane)					
water that flowed at surface.....	4	82			

Well 28/4-22B1, U. S. Army Air Corps

[Half a mile east of State Highway 11 just south of crossing of NW.-SE. and NE.-SW. landing strips at Payne Field. Altitude about 580 ft. Drilled by WPA about 1938. Cased with 10-, 8-, 6-, and 4½-in. casings; no record of perforations]

Soil.....	2½	2½	Admiralty clay:		
Till of the Vashon glaciation:			Clay and silt.....	17	337
"Hardpan" (called "shale and			Clay and pea gravel.....	14	351
gravel").....	181½	184	Clay and silt.....	33	384
"Hardpan" and sand, mixed.....	0	190	Sand.....	4	388
Esperance sand member: Sand;			Silt with 2-in. gravel streak		
water bearing below depth of			at 470 ft.....	155	543
240 ft.....	130	320	Gravel, pea-sized, with coarse		
			sand and streaks of clay.....	4	547

Attachment B

Log for Well 28B01

CONTENTS

- Log for Well 28B01
- The Ecology well log database indicated (apparently incorrectly) that this well was in Section 16 (of the Public Lands Survey).

ATTACHMENT B: LOG FOR WELL 28B01

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy to
Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Permit No. _____

(1) OWNER: Name GOLF N.W. INC Address P.O. BOX 1650 DUVALL WA 98019

(2) LOCATION OF WELL: County SNOHOMISH Section 28 N. R. 4 W.M.

Bearing and distance from section or subdivision corner _____

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☒ Test Well ☒ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one) 1
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 552 ft. Depth of completed well 552 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 8" Diam. from +1 ft. to 320 ft.
Threaded ☐ 6" Diam. from +1 ft. to 552 ft.
Welded ☒ " Diam. from " ft. to " ft.

Perforations: Yes ☐ No ☒
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
perforations from _____ ft. to _____ ft.
perforations from _____ ft. to _____ ft.
perforations from _____ ft. to _____ ft.

Screens: Yes ☒ No ☐
Manufacturer's Name JOHNSON
Type TELESCOPE Model No. _____
Diam. 6" Slot size 1/80 from 552 ft. to 542 ft.
Diam. 4" Slot size 1/40 from 552 ft. to 547 ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes ☒ No ☐ To what depth? 18 ft.
Material used in seal _____
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____ HP. _____
Type: _____

(8) WATER LEVELS: Land-surface elevation above mean sea level. 487 ft.
Static level 344 ft. below top of well Date 11-20-88
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom? _____
Yield: _____ gal./min. at _____ ft. drawdown after _____ hrs.
" " " " " " " "
" " " " " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)
Time Water Level Time Water Level
_____ _____ _____ _____
_____ _____ _____ _____
_____ _____ _____ _____

Date of test DEC 07 1988

Flow test: _____ gal./min. with _____ ft. drawdown after _____ hrs.
Artesian flow _____ p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes ☐ No ☒

(10) WELL LOG:
Formation: TOP SOIL color, character, size of material and structure, and show thickness of each layer and the kind and nature of the material in each stratum penetrated; enter at least one entry for each change of formation.

MATERIAL REGION	FROM	TO
TOP SOIL	0	1
GRAY TILL HARD GRAVEL	1	12
11 CLAY SANDY GRAVEL COBBLES w/ SOME		
WATER LENSES LOW YIELD	12	65
GRAY CLAY	65	75
11 SILTY SANDY CLAY	75	84
11 CLAY	84	145
11 11 TRACES SAND & GRAVEL	145	175
11 SILT SOME WATER	175	182
11 SILTY CLAY	182	215
11 CLAY FINE SAND & GRAVEL	215	225
11 11 STICKY	225	236
11 11 DRY W/GRAVEL	236	245
11 11 SANDY 11	245	255
LTBROWN SANDY SILTY GRAVEL	255	270
GRAY SILTY FINE SAND	270	275
11 11 COARSE 11	275	285
11 11 FINE SAND COBBLES, BOLDERS,		
CLAMSHELLS, WOOD SOME MUD SAND	285	407
SILTY GRAY CLAY	407	423
11 MUD SAND SHELLS WOOD SOME WATER AT	423	430
HEAVING FINE SAND	430	447
SILTY GRAY CLAY	447	480
BLUE CLAY	480	485
GRAY CLAY	485	493
GREEN SANDSTONE SOME SILTSTONE	493	497
GRAY FINE SAND	497	505
11 SILTY CLAY	505	510
11 SILT	510	520
11 11 CLAY	520	537
11 DRY 11	537	537
SAND GRAVEL WATER	537	552

SCREEN RISER DOUGLAS KINGMAN
10' 6" | 3' 8" | 8"

Work started 9-1, 1988. Completed 11-20, 1988.

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME MOORE DRILLING
(Person, firm, or corporation) (Type or print)

Address PO Box 1650 Duvall WA 98019

(Signed) [Signature] (Well Driller)

License No. 1534 Date 11-5, 1988

Important Information

About Your Environmental Site Assessment/Evaluation Report

ENVIRONMENTAL SITE ASSESSMENTS/EVALUATIONS ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

This report was prepared to meet the needs you specified with respect to your specific site and your risk management preferences. Unless indicated otherwise, we prepared your report expressly for you and for the purposes you indicated. No one other than you should use this report for any purpose without first conferring with us. No one is authorized to use this report for any purpose other than that originally contemplated without our prior written consent.

The findings and conclusions documented in this site assessment/evaluation have been prepared for specific application to this project and have been developed in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in this area. The conclusions presented are based on interpretation of information currently available to us and are made within the operational scope, budget, and schedule constraints of this project. No warranty, express or implied, is made.

OUR REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

Our environmental site assessment is based on several factors and may include (but not be limited to) reviewing public documents to chronicle site ownership for the past 30, 40, or more years; investigating the site's regulatory history to learn about permits granted or citations issued; determining prior uses of the site and those adjacent to it; reviewing available topographic and real estate maps, historical aerial photos, geologic information, and hydrologic data; reviewing readily available published information about surface and subsurface conditions; reviewing federal and state lists of known and potentially contaminated sites; evaluating the potential for naturally occurring hazards; and interviewing public officials, owners/operators, and/or adjacent owners with respect to local concerns and environmental conditions.

Except as noted within the text of the report, no sampling or quantitative laboratory testing was performed by us as part of this site assessment. Where such analyses were conducted by an outside laboratory, Shannon & Wilson relied upon the data provided and did not conduct an independent evaluation regarding the reliability of the data.

CONDITIONS CAN CHANGE.

Site conditions, both surface and subsurface, may be affected as a result of natural processes or human influence. An environmental site assessment/evaluation is based on conditions that existed at the time of the evaluation. Because so many aspects of a historical review rely on third-party information, most consultants will refuse to certify (warrant) that a site is free of contaminants, as it is impossible to know with absolute certainty if such a condition exists. Contaminants may be present in areas that were not surveyed or sampled or may migrate to areas that showed no signs of contamination at the time they were studied.

Unless your consultant indicates otherwise, your report should not be construed to represent geotechnical subsurface conditions at or adjacent to the site and does not provide sufficient information for construction-related activities. Your report also should not be used following floods, earthquakes, or other acts of nature; if the size or configuration of the site is altered; if the location of the site is modified; or if there is a change of ownership and/or use of the property.

INCIDENTAL DAMAGE MAY OCCUR DURING SAMPLING ACTIVITIES.

Incidental damage to a facility may occur during sampling activities. Asbestos and lead-based paint sampling often require destructive sampling of pipe insulation, floor tile, walls, doors, ceiling tile, roofing, and other building materials. Shannon & Wilson does not provide for paint repair. Limited repair of asbestos sample locations is provided. However, Shannon & Wilson neither warrants repairs made by our field personnel, nor are we held liable for injuries or damages as a result of those repairs. If you desire a specific form of repair, such as those provided by a licensed roofing contractor, you need to request the specific repair at the time of the proposal. The owner is responsible for repair methods that are not specified in the proposal.

READ RESPONSIBILITY CLAUSES CAREFULLY.

Environmental site assessments/evaluations are less exact than other design disciplines because they are based extensively on judgment and opinion and there may not have been any (or very limited) investigation of actual subsurface conditions. Wholly unwarranted claims have been lodged against consultants. To limit this exposure, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses may appear in this report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

Consultants cannot accept responsibility for problems that may develop if they are not consulted after factors considered in their reports have changed or conditions at the site have changed. Therefore, it is incumbent upon you to notify your consultant of any factors that may have changed prior to submission of the final assessment/evaluation.

An assessment/evaluation of a site helps reduce your risk but does not eliminate it. Even the most rigorous professional assessment may fail to identify all existing conditions.

ONE OF THE OBLIGATIONS OF YOUR CONSULTANT IS TO PROTECT THE SAFETY, HEALTH, PROPERTY, AND WELFARE OF THE PUBLIC.

If our environmental site assessment/evaluation discloses the existence of conditions that may endanger the safety, health, property, or welfare of the public, we may be obligated under rules of professional conduct, statutory law, or common law to notify you and others of these conditions.

The preceding paragraphs are based on information provided by the Geoprofessional Business Association (<https://www.geoprofessional.org>)

Appendix D

Field Methods

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Soil Description and Log Key (2 sheets)

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Figure D-4: Log of Boring FP-MW4 (3 sheets)

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Figure D-17: Log of Geoprobe FP-P11

Attachments

Attachment D-1: IDW Disposal Documentation

Attachment D-2: PFAS Reference Document RD-B74

D.1 INTRODUCTION

This appendix provides a summary of field methods undertaken during 2022 and 2023 for the evaluation of a release of PFAS at the former Fire Training Pit (FTP) and vicinity.

Field activities were conducted during several mobilizations. An outline of the mobilization dates is provided below.

- May 2022 – Soil and groundwater sampling from boreholes and installation of monitoring wells FP-MW1 through FP-MW4
- June 2022 – Groundwater sampling from monitoring wells and groundwater level measurements
- September 2022 – Groundwater level measurements and groundwater level measurements
- October 2022 – Installation of monitoring wells FP-MW5 and FP-MW6
- November and December* 2022 (*one well in December 2022) – Groundwater sampling from monitoring wells
- January 2023 – Groundwater level measurements and hillside seepage location
- March 2023 – Groundwater level measurements and hillside seepage location

Field methods, including drilling, field screening, sample collection, installation of monitoring wells, and documentation procedures, are described in the following sections. Procedures were completed in accordance with Shannon & Wilson's standard operating guidelines.

D.2 CONTRACTORS

Contractors used for the work described in this appendix are as follows:

- Driller Holt Services; Edgewood, Washington
- Utility Location Applied Professional Services (APS); North Bend, Washington
- Surveyor APS Survey & Mapping; Bellevue, Washington
- Laboratories Eurofins TestAmerica; West Sacramento, California
Fremont Analytical, Seattle, Washington (non-PFAS analytes)
- Waste Disposal Chemical Waste Management; Arlington, Oregon

D.3 PREPARATION

In advance of the fieldwork, various preparations were completed as follows.

D.3.1 Site Access Requirements and Notifications

Security clearance and badging were completed with the Paine Field Badging Office in order to access the investigation area. The process included online training, an interview, and a background check.

Prior to arriving on site, the field personnel would notify airport authorities of the expected dates and work areas.

D.3.2 Utility Clearance

Exploration locations were placed to avoid known utilities. The proposed exploration locations were marked in advance of the drilling activities and the public One-Call utility check system was notified. APS, a private utility clearance contractor, surveyed exploration locations and the vicinity of exploration locations for indications of utilities. The locations of several boreholes were shifted due to proximity to potential underground utilities.

D.3.3 Equipment Preparation

Field equipment and field forms were prepared prior to mobilization. A checklist of equipment required during sampling activities was reviewed each morning. Laboratory-supplied sample containers were inspected for the proper preservative and inventoried to check that adequate containers were available.

The calibration of meters was checked using reference standards prior to the start of each work period. The calibrations were found to be valid for field conditions and were completed in accordance with manufacturer recommendations. Calibration checks were documented in calibration notebooks for equipment.

D.3.4 Health and Safety

A Site-specific Health and Safety Plan (HASP) was prepared and submitted to Snohomish County. The HASP was prepared consistent with the requirements of the Washington State Division of Occupational Safety and Health Hazardous Waste Operations Regulation (Washington Administrative Code 296 843). The HASP included a description of the project team, the scope of work, site control, site hazard information, site hazard control, and emergency response. Information about the nearest hospital, including a map, was also provided.

During fieldwork, planned field activities and relevant health and safety topics were discussed during daily tailgate meetings. Health and safety topics included but were not limited to: action levels and proper use of personal protective equipment, working near heavy equipment, handling contaminated material, decontamination procedures, and spill response.

No adverse health and safety events were identified during fieldwork.

D.4 SOIL INVESTIGATION

The soil investigation included collection and analysis of 34 soil samples from 16 exploration locations. Soil investigation field activities took place during March 2022. The selected locations and depths for the soil investigation are discussed in Section D.4.1.

Collection of soil was completed using several methods, including direct-push drilling, sonic drilling, hand-auger, and hand shovel. The soil sampling methods are discussed in more detail in Section D.4.2.

Soil obtained from explorations was visually described using Shannon & Wilson's soil identification system, which is a modified version of the Unified Soil Classification System. The soil description key and boring logs are provided in Figures D-1 through D-17 of this appendix.

After soil samples were collected, the borings were either immediately backfilled with hydrated bentonite chips or a monitoring well was installed as described in Section D.5.1. Soil samples were submitted for analytical testing as discussed in Section 5.3.

D.4.1 Locations and Depths

The exploration locations and depths were selected to evaluate the lateral and vertical extents of soil and groundwater impacts due to the release of PFAS at the FTP. Groundwater was observed to be perched on the glacial till.

Explorations were generally advanced to the depth of competent glacial till, except as noted in the bullets below.

- Hand-auger exploration FP-HA1 was located near the peak of 20-foot mound of soil. The location was initially planned to be drilled using a direct-push drill rig, but height limitations due to airport operations prohibited use of a drill rig; therefore, a hand-auger was used to collect soil samples. The hand-auger was advanced until refusal due to cobbles at 4 feet below ground surface (bgs).

- Hand shovel explorations FP-SH1 and FP-SH2 were advanced to 0.5 foot bgs to collect soil samples below the vegetation (grass).
- Sonic borehole FP-MW4 was advanced to 105 feet depth using sonic drilling. The purpose of the exploration was to evaluate for the presence of groundwater at depths under the zone of perched groundwater on top of the glacial till unit. A deeper saturated zone was not encountered in the borehole.

The lateral positions of the borings were spaced throughout the grassy field area adjacent to the FTP and across Taxiway K-5 to evaluate for the lateral extent of PFAS impacts.

Exploration locations are shown in Figure 2 of the main report. The coordinates and total depth of explorations are shown in the boring logs attached to this appendix.

D.4.2 Soil Sampling Methods

In general, direct-push drilling was used for soil investigation borings, except sonic drilling was used for on deeper boring and a hand-auger and hand shovel were used for near-surface soil sampling. A description of the soil sampling methods is provided below.

D.4.2.1 Direct-Push Drilling

At direct-push locations, the static weight of the hydraulic probe rig combined with percussive energy were used to advance a series of hollow metal rods. To collect soil from the borehole, a 2-inch-diameter 5-foot-long hollow metal rod fitted with a removable inner polyvinyl chloride (PVC) liner was driven into undisturbed soil continuously from the ground surface to the desired depth of the boring. The retained in the system was in contact with the PVC liner.

Upon retrieval of the metal probe, the PVC liner and entrained soil were extruded from the metal tube, the PVC liner was then sliced open, the soil was field screened for contaminants, and metals spoons were used to move soil from the liner to the sample containers. Photos of the direct-push drill rig and PVC liner are provided in Exhibits D-1 and D-2.



Exhibit D-1: Photo of Direct-Push Drill Rig at Exploration FP-P1 (View Direction is South)



Exhibit D-2: Photo of Sliced PVC Liner and Soil Core at Exploration FP-P1

D.4.2.2 Sonic Drilling

Sonic drilling was employed at exploration FP-MW4 because of the anticipated depth and anticipated friction and density from the glacial till unit. Sonic drilling methods utilize a

hollow metal tube with diamond-embedded cutting head. The metal tube is connected to oscillators at the drill rig. The oscillators transmit high-frequency, resonant sonic energy through the drill string, which causes the surrounding material to fluidize and reduces friction. Once the cutting head is advanced for an interval (typically 5 feet), a larger diameter hollow metal casing is advanced around the cutting head. Then the cutting head and 5 feet of soil core are retrieved from the borehole. The soil core is vibrated from the metal tube into a cylindrical plastic bag. The cutting head is then advanced further in the borehole to the next deeper interval. And the process repeats until the total depth of the borehole is achieved.

An 8-inch conductor casing was installed from ground surface to 35 feet depth to limit the potential for migration of PFAS-impacted groundwater from the perched zone above the glacial till to deeper horizons via the borehole. Competent glacial till was observed starting at 30 feet depth. The saturated zone was observed at 21.3 to 30 feet depth. The 8-inch conductor casing was set in a seal of hydrated bentonite chips set at 30 to 35 feet depth.

When available, the PVC core bags were cut open, the soil was field screened for contaminants, and metals spoons were used to move soil from the bag to the sample containers. Photos of the sonic drill rig and PVC core bags are provided in Exhibits D-3 and D-4.



Exhibit D-3: Photo of Sonic Drill Rig at Exploration FP-MW4 (View Direction is North)



Exhibit D-4: Photo of PVC Core Bag from Sonic Drilling at Exploration FP-MW4

D.4.2.3 Hand Shovel

At exploration FP-SH1 and FP-SH2, a metal hand shovel was used to remove vegetation (grass) and to expose shallow soil. Metal spoons were used to collect soil directly from the exposed surface to sample containers. A photo of explorations FP-SH1 is provided in Exhibit D-5.



Exhibit D-5: Photo of Exploration FP-SH1

D.4.2.4 Hand-Auger

At exploration FP-HA1, a metal hand-auger was advanced into the subsurface by rotating the auger around the vertical axis, allowing the blades to cut into the soil. Soil cuttings were retained in a metal cylinder that was immediately above the blades. When the cylinder was full, the auger was brought to the surface and the soil in the cylinder was emptied. Soil cuttings were then screened for indications of contamination. Metal spoons were used to move soil into sample containers. A photo of a hand-auger is provided in Exhibit D-6.



Exhibit D-6: Photo of Hand-Auger Exploration FP-HA1 (View Direction is South)

D.4.3 Soil Sample Collection

Field personnel collected soil samples by first donning a new pair of disposable nitrile gloves. Dedicated stainless-steel spoons were used to transfer soil to the appropriate laboratory-supplied sample containers.

Once filled, the sample containers were placed in a cooler with ice to maintain the samples within the acceptable temperature range of 0 degree Celsius (°C) to 6 °C. The samples were transported under standard chain-of-custody (COC) procedures to the laboratory. Sample handling and field quality assurance (QA) sample collection procedures are discussed in Section 0. The selected analytical methods are discussed in Section D.8.

D.5 GROUNDWATER INVESTIGATION

The groundwater investigation included measurement of groundwater levels, sampling of groundwater from four boreholes, and installation and sampling of groundwater from six monitoring wells. Groundwater investigation field activities took place during several mobilization from March 2022 to January 2023. Methods for the groundwater investigation are discussed in the following sections.

D.5.1 Groundwater Sampling from Boreholes

In March 2022, four direct-push borings were advanced for the collection of soil and groundwater samples. The purpose of the borings was to evaluate the lateral extents of PFAS impacts to soil and groundwater located upgradient and crossgradient from the FTP.

A temporary sampling point was placed in borings to collect water samples. The temporary sampling point consisted of a 3/4-inch Schedule 40 PVC pipe with 10 feet of slotted screen. A peristaltic pump was used to purge water from the sampling point (Exhibit D-7). In general, the recharge rate was observed to be slow and the purge water remained turbid due to silt prior to sampling (see Exhibit D-8).



Exhibit D-7: Photo of Sampling a Groundwater Temporary Sampling Point FP-P9

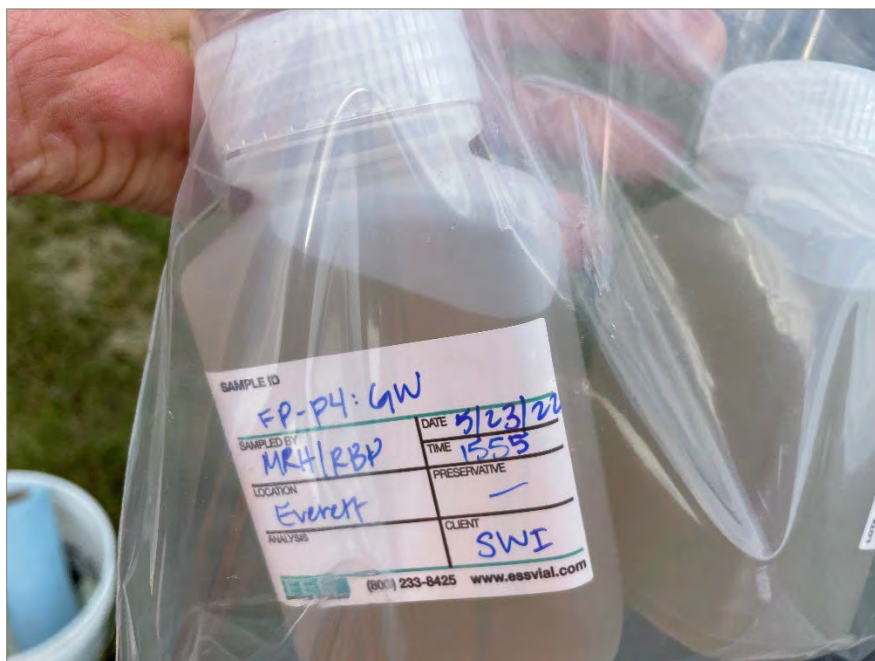


Exhibit D-8: Photo of Water Sample Containers from Temporary Sampling Point FP-P4

After samples were collected, the temporary sampling points were removed, and the boreholes were backfilled with bentonite chips to ground surface.

D.5.2 Monitoring Well Installation

Six monitoring wells were installed on the site: FP-MW1 through FP-MW6. Wells were installed in direct-push borings, except for FP-MW4, which was installed in a sonic boring. A Shannon & Wilson representative was on site to observe drilling activities and collect soil samples, log soil, and select the screened intervals for the monitoring wells. Soil samples were collected in the borings in accordance with Section D.4.3. Monitoring wells were screened to allow sampling of the groundwater perched on the glacial till. The bottom of the screened intervals was set at the approximate depth of the potential aquitard (glacial till). The screening depths and other well characteristics are provided in the boring logs (Figures D-1 through D-17).

Groundwater monitoring wells were constructed of either 3/4-inch or 2-inch Schedule 40 PVC. The screens were 0.010-inch slot. No. 10-20 sand was used for the filter pack. The well was covered with a flush-mounted traffic-rated metal lid encased in concrete from surface to approximately 2 feet bgs. The location and elevation of monitoring wells was surveyed by a licensed surveyor. A summary of well construction details is provided in Table 1 of the main report.

D.5.3 Monitoring Well Development

Newly installed monitoring wells were developed using a check valve and Waterra motor. The check valve had a slightly smaller diameter than the well casing and was connected to the bottom end of a length of 5/8-inch high-density polyethylene (HDPE) tubing. The check valve and tube were lowered in the well casing to the screened interval and attached to the Waterra motor. The Waterra motor lifted and lowered the check valve and tube approximately 6 inches in a reciprocating motion to draw water into the well casing from the filter pack and force water into the tubing. Development started at the top of the screened interval and the assembly was lowered 6 inches after approximately 5 minutes of development at each interval. Purge water was pumped from the well via the check valve using the reciprocating motion. At completion of development activities, the purge water appeared clear.

Of note, it was not practicable to develop or collect a sample from well FP-MW6 because the water level in the well was low and the recharge took several hours.

D.5.4 Groundwater Level Measurements

Groundwater levels were measured at monitoring wells at an approximate quarterly frequency from June 2022 to March 2023. A water level indicator was used to measure the depth to groundwater from the top of casing. The surveyed elevation of the casing was used to calculate the elevation of the groundwater table and the groundwater gradient. The groundwater level measurements are provided in Table 2 of the main report. The groundwater gradient was approximately westerly and is shown in Figures 6A through 6E of the main report.

D.5.5 Groundwater Sampling from Monitoring Wells

Groundwater samples were collected from monitoring wells for analysis of PFAS. The methodology was consistent with U.S. Environmental Protection Agency (EPA) guidelines for low flow purging and sampling.¹ Purging and sampling procedures are discussed below.

¹ U.S. Environmental Protection Agency (EPA), 2017, Low stress (low flow) purging and sampling procedures for the collection of groundwater sampling from monitoring wells: Prepared by U.S. Environmental Protection Agency, Region 1, North Chelmsford, Mass., document no. EQASOP-GW4, revision 4, September 19, available: <https://www.epa.gov/sites/default/files/2017-10/documents/eqasop-gw4.pdf>

D.5.5.1 Low Flow Purging

The purpose of purging groundwater from wells is to remove stagnant water from within the well casing so that samples are representative of the groundwater at the well location.

Purging was accomplished using either a bladder pump or peristaltic pump. A peristaltic pump was used at wells unless precluded due to physical limitations of the pumping method (i.e., water table deeper than approximately 30 feet). A bladder pump was used when the water table was deeper than approximately 30 feet.

When using the peristaltic pumping method, low-density polyethylene (LDPE) or HDPE tubing and silicone tubing were connected to a peristaltic pump at the surface and the tubing was lowered in the well casing. The peristaltic pump was used to take a suction on the tubing to pump water to the surface. The use of LDPE is discussed in Section C.6.1.

When using a bladder pump, an PTFE or LDPE bladder was used in the pump chamber and LDPE or HDPE tubing was connected from the pump chamber to the air compressor on the surface. The air compressor pressurized one side of the bladder then released the pressure (cyclically) to force water from the pump to the surface in a separate length of tubing.

The use of LDPE tubing and PTFE bladders was accidental. PFAS compounds are used in the making of LDPE and PTFE; therefore, there is a concern of the potential for cross-contamination to sampling media. The uses of LDPE tubing and PTFE bladders are discussed in Sections C.6.1 and C.6.2, respectively.

For each groundwater sample collected from a monitoring well:

1. The pump intake (peristaltic tubing or bladder pump chamber) was slowly lowered into the well until the intake was placed 2 to 3 feet below the water table. PFAS tends to concentrate at the interface of water; therefore, the well screens were installed to extend above the water table. The intake was placed at 2 to 3 feet below the water table to optimize the potential to collect dissolved PFAS.
2. Pumping rates were calculated with a stopwatch and a container of known volume. The pumping rate was adjusted to between 150 milliliters per minute and 1 liter per minute and to obtain a steady level of the water table. If possible, a drawdown of 0.3 foot or less was maintained in the well and the water level was maintained above the intake. The water level was measured every three to five minutes.
3. Water quality parameters were measured every three to five minutes during purging using a water quality meter. Measurements were recorded to the following standards:
 - pH to plus or minus ($\pm$)0.01 pH units,
 - Specific conductivity to $\pm$ 0.01 millimhos per centimeter,

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- Temperature to ± 0.1 °C,
 - Dissolved oxygen (DO) to ± 0.01 milligrams per liter (mg/L),
 - Oxidation reduction potential (ORP) to ± 1 millivolt,
 - Turbidity to ± 0.1 nephelometric turbidity unit (NTU),
 - Salinity to $\pm 0.01\%$, and
 - Total dissolved solids to ± 0.001 gram per liter.
4. Groundwater samples were collected once water quality parameters were stabilized. Stabilization occurred when three consecutive water quality readings were within a specified tolerance from each other. The following criteria were monitored for stabilization:
- pH ± 0.1 pH units (i.e., readings within 0.1 of each other),
 - Specific conductivity $\pm 3\%$,
 - Temperature $\pm 3\%$,
 - DO $\pm 10\%$ for values greater than 0.5 mg/L, if three consecutive DO values are less than 0.5 mg/L, the parameter was considered to be stabilized,
 - ORP ± 10 millivolts, and
 - Turbidity $\pm 10\%$ for values greater than 5 NTU; if three consecutive turbidity values are less than 5 NTU, the parameter was considered to be stabilized.
5. If water quality parameters did not stabilize after one hour of pumping and at least three well volumes, a groundwater sample was collected and the lack of stabilization was recorded in the field log. Well purging measurements were recorded in field logs.

Of note, it was not practicable to develop or collect a sample from well FP-MW6 because the water level in the well was low and the recharge took several hours. Although the well was not sampled, the water level was measured in January 2023 and March 2023.

A photo of a typical setup of peristaltic pump equipment used for purging is provided below in Exhibit D-9.



Exhibit D-9: Photo of a Typical Setup of Groundwater Purging Equipment Using a Peristaltic Pump

D.5.5.2 Groundwater Sample Collection

Upon completion of purging and parameter stabilization, samples were collected from the discharge end of the pump tubing into the laboratory-supplied containers. Sample handling and field QA sample collection procedures are outlined within Section D.7.1.

After sample collection was complete, the tubing and/or bladder pump were removed, the well cap was replaced, and the monument lid was secured.

D.6 PRECAUTIONS WHEN SAMPLING FOR PFAS

Due to the prevalence of PFAS in consumer products and the low detection levels used for this project, special sampling and handling techniques were implemented to limit the potential for cross-contamination. The sampling and handling techniques, necessary to limit the potential for cross-contamination, generally consist of proper decontamination and sampling procedures and selection of PFAS-free personal protective equipment (PPE), equipment, and materials and may contact sample media. Details of Shannon & Wilson's standard operating guidance for sampling of PFAS are provided in Attachment D-2.

As part of an academic study in 2020 conducted by researchers at Oregon State University, common products used for environmental investigations were tested for the potential to

leach PFAS to soil and groundwater samples (Fields and others 2020²). The study concluded that restrictions on materials should focus only on materials that come in direct contact with field samples.

To evaluate the potential for cross-contamination from equipment and materials used during field collection and samples, a list materials that had the potential for direct contact with sample media is provided as Exhibit D-10.

Exhibit D-10: Materials with the Potential for Direct Contact with Sample Media

Process	Materials	Single-Use or Reusable After Decontamination
Drilling and soil sampling	PVC soil core bags for sonic drilling	Single Use
	PVC soil sleeves for direct push drilling	Single Use
	Metal hand-auger	Reused After Decontamination
	Metal shovel	Reused After Decontamination
	Metal sampling spoons	Reused After Decontamination
Solution for decontaminating sampling spoons and water level indicator	Alconox™ detergent	N/A
	Lab deionized water (PFAS free)	N/A
Water level measurement	Water Level Indicator	Reused After Decontamination
Groundwater well development	5/8-inch HDPE tubing	Single-Use
	Metal check valve	Reused After Decontamination
Groundwater purging and sampling with a bladder pump	PTFE bladder ¹	Single-Use
	LDPE bladder	Single-Use
	Size 15 silicone tubing	Single-Use
	1/4-inch LDPE tubing	Single-Use
	1/4-inch HDPE tubing	Single-Use
Groundwater purging and sampling with a peristaltic pump	Size 15 silicone tubing	Single-Use
	1/4-inch LDPE tubing	Single-Use
	1/4-inch HDPE tubing	Single-Use
Construction materials for monitoring wells	No. 10x20 silica sand for filter pack	N/A
	PVC pipe and screen (joints were threaded and not glued)	N/A
	3/8-inch bentonite chips for seal	N/A
	3/4inch PVC wells with pre-pack screen	N/A

NOTES:

¹ PTFE is a fluorinated polymer that may have detectable concentrations of PFAS. See discussion in in this section below.

N/A = not applicable; PTFE = polytetrafluoroethylene

² Fields and others, 2020, Field sampling materials unlikely source of contamination for perfluoroalkyl and polyfluoroalkyl substances in field samples: available:

<https://pubs.acs.org/doi/full/10.1021/acs.estlett.0c00036>

D.6.1 LDPE Tubing

LDPE tubing was used for sample collection of water samples from temporary sampling points and monitoring wells using the bladder pump and peristaltic pump during June 2022. PFAS compounds are used in the making of LDPE; therefore, there is a concern of the potential for cross-contamination to sampling media. HDPE tubing is the preferred material and was used for subsequent sampling events.

Two equipment blanks (sample IDs FP-EB1 and FP-EB2) were collected from the peristaltic pump and bladder pump using LDPE tubing during the June 2022 event. Three PFAS compounds were detected in the equipment blank samples with the highest concentration being 4.8 nanograms per liter (ng/L) of PFOS (see Table 4 of the main report). It is unknown if the LDPE tubing contributed to the detections of PFAS in the equipment blanks. The same three PFAS compounds were detected in groundwater samples FP-MW2 and FP-MW3 at concentrations at least three magnitudes higher than the detections in the equipment blanks, suggesting that the PFAS leached from the LDPE tubing, if any, did not significantly affect the analytical results for the groundwater samples.

D.6.2 Bladders for Bladder Pump

PTFE bladders were accidentally used to collect water samples from FP-MW2 and FP-MW3 during June 2022. Because PFAS compounds are used in the making of PTFE, there is a concern of the potential for cross-contamination to sampling media. An equipment blank (sample ID FP-EB2) was collected from the bladder pump and had detected concentrations of three PFAS with the highest concentration being 4.8 ng/L of PFOS (see Table 4 of the main report). It is unknown if the PTFE bladder contributed to the detections of PFAS in the equipment blank. The same three PFAS compounds were detected in groundwater samples FP-MW2 and FP-MW3 at concentrations at least three magnitudes higher than the detections in the equipment blank, suggesting that the PFAS leached from the bladder pump, if any, did not significantly affect the analytical results for the groundwater samples.

LDPE bladders were used for sample collection during November 2022. LDPE bladders were the only practicable alternative to PTFE bladders. Although LDPE is preferable to PTFE, PFAS compounds are also used in the making of LDPE; therefore, there is a concern of the potential for cross-contamination to sampling media. An equipment blank (sample ID EB-1-11222022) was collected from the bladder pump and had no detectable PFAS. Results are provided in Table 5. During the June 2022 and November 2022 sampling events, PFAS were detected at similar concentrations in samples where water was collected using a bladder pump (wells FP-MW2 and FP-MW3). The analytical results suggest that the PFAS leached from the bladder pump during the June 2022 or November 2022 events, if any, did not significantly affect the analytical results for the groundwater samples.

D.7 FIELD QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

Field QA/quality control (QC) procedures, discussed below, were established to ensure that samples were tracked from collection through analysis, to evaluate the efficiency and reproducibility of sampling procedures; and to prevent cross-contamination to samples.

D.7.1 Sample Handling, Chain-of-Custody, and Transportation Procedures

Environmental samples collected during the project were labeled, stored, and transported using standard Shannon & Wilson protocols. These protocols are summarized below.

D.7.1.1 Sample Labeling

Sample container labels were completed immediately before or immediately following sample collection. Labels were completed using indelible ink. At a minimum, container labels included the following information:

- Date and time of collection,
- Location of the sample,
- Name or initials of sample collector,
- Unique sample identification,
- Analysis requested, and
- Chemical preservative used, if any.

The nomenclature for soil samples was:

Boring Name:Sample Depth

For example, a soil sample collected from 5.5 feet bgs from boring FP-P1, would be identified as:

FP-P1:5.5

The established nomenclature for groundwater samples was:

Well Name-Date

For example, a groundwater sample from well FP-MW1 collected on February 1, 2022, would be identified as:

FP-MW1-02012022

Duplicate samples were labeled with a discrete well/boring name commencing at numeral 100. For example:

FP-MW100-02012022 or FP-P100:5.5

Equipment blanks had the initials EB, were numbered sequentially, and dated:

EB-1-02012022

D.7.1.2 Chain-of-Custody

Once a sample was collected, it was placed within a cooler with ice and remained in the custody of the sampler until shipment, pick-up, or delivery to the laboratory, or until the sample possession was transferred to another party. Sample information was entered onto a COC form along with the requested analyses.

Upon transfer of sample possession to subsequent parties, the COC form was signed and time stamped by the person(s) transferring and receiving custody of the sample container. Upon receipt of samples at the laboratory, the condition of the samples was recorded by the receiver. COC records were included in the analytical report prepared by the laboratory.

Upon receipt of samples (which were accompanied by a completed COC record detailing requested analyses), the Laboratory Coordinator(s) or his/her delegate:

- Verified all paperwork, COC records, and similar documentation;
- Logged in samples, assign unique laboratory sample numbers, and attach the numbers to the sample container(s);
- Performed any requested laboratory filtration and preservation;
- Opened a project file and enter data into the file;
- Stored samples in a refrigerated sample bank; and
- Emailed a record of the sample receipt and log-in form to the Shannon & Wilson Project Manager noting any issues with the samples.

D.7.1.3 Sample Transportation

Samples were transported by field personnel to FedEx for ship to the laboratory. The cooler contained ice to ensure that samples were maintained within the appropriate temperature range (between 0 °C and 6 °C). Custody seals were placed on coolers prior to shipment. The seals were reviewed by the lab upon receipt to look for indications of tampering. No indications of tampering were observed.

D.7.2 Quality Assurance/Quality Control Samples

QA/QC samples were collected during the event to evaluate the reproducibility of the sampling technique and the subsequent laboratory analysis. These included field duplicate samples and equipment blank samples. Evaluation of QA/QC samples is discussed in the Data Quality Summary Report (Appendix E of the main report).

D.7.2.1 Field Duplicate Samples

Field duplicate samples were split from the primary sample at the time of collection. The field duplicate samples were submitted to the laboratory with a “dummy” sample name and sampling time to ensure the laboratory was “blind” to the presence of a QA sample. The field duplicate samples were analyzed using the same methods and analyte reporting lists as the primary sample. The analytical results of the field duplicates were compared to primary samples to assess laboratory precision and the reproducibility of the sampling technique.

One soil field duplicate sample was collected for at least every 20 soil samples. One groundwater field duplicate sample was collected for at least every 20 groundwater samples. The field team noted in the field logs the identifies of duplicate samples and associated primary samples. A list is provided in Exhibit D-11 below.

Exhibit D-11: List of Field Duplicate Samples

Field Duplicate Sample	Primary Sample	Matrix	Sample Collection Date	Laboratory Work Order
FP-P100:0.5	FP-P7:0.5	Soil	5/24/2022	320-88345-1
FP-P101:1.5	FP-P8:1.5	Soil	5/24/2022	320-88345-1
FP-MW100:0.4	FP-MW1:0.4	Soil	5/24/2022	320-88345-1
FP-MW101:0.5	FP-MW2:0.5	Soil	5/25/2022	320-88345-1
FP-MW102:0.5	FP-MW3:0.5	Soil	5/25/2022	320-88345-1
FP-MW100:GW	FP-MW1:GW	Water	6/2/2022	320-88632-1
FP-MW100-11212022	FP-MW4-11212022	Water	11/21/2022	320-94720-1

Field duplicates were evaluated as part of the data validation procedure and findings are discussed in Appendix E of the main report.

D.7.2.2 Equipment Blank Samples

The purpose of equipment blank samples was to evaluate the potential for cross contamination from equipment and materials that may contact the sample media (soil and groundwater). Equipment blank samples were collected using laboratory-provided water poured over equipment or materials that would later be in contact with sample media (soil or water). If the equipment was reusable, the equipment was decontaminated prior to collecting the equipment blank sample. Laboratory-provided water was procured from Eurofins laboratory of West Sacramento, California. The water was filtered and regularly tested to have no detectable concentrations of PFAS.

A list of equipment blank samples, the sample source, and requested analyses is provided below.

Exhibit D-12: List of Equipment Blank Samples

Sample Name	Description	Sample Collection Date	Laboratory Work Order
FP-EB1	Equipment Blank from a peristaltic pump and single-use tubing. The tubing was disposed between sample locations. The same type of tubing was used for the following samples: - FP-MW1:GW - FP-MW4:GW - FP-MW100:GW	6/2/2022	320-886321-1
FP-EB2	Equipment blank from a decontaminated bladder pump (metal case and PTFE bladder) and single-use LDPE tubing. The tubing and bladder were disposed between sample locations. The same bladder pump was used for the following samples and decontaminated between sample locations: - FP-MW2:GW - FP-MW3:GW	6/2/2022	320-886321-1
EB-1-11222022	Equipment blank from a decontaminated bladder pump (metal case and LDPE bladder) and single-use tubing. The tubing and bladder were disposed between sample locations. The same bladder pump was decontaminated between sample locations and used for the following samples: - FP-MW2-11232022 - FP-MW3-11232022	11/22/2022	320-94720-1
EB-2-11222022	Equipment Blank from a peristaltic pump and single-use tubing. The tubing was disposed between sample locations. The same type of tubing was used for the following samples: - FP-MW4-11212022 - FP-MW5-11212022 - FP-MW100-11212022	11/22/2022	320-94720-1

Equipment blanks were evaluated as part of the data validation procedure, and findings are discussed in Appendix E of the main report.

D.7.3 Equipment Decontamination

Reusable sampling and monitoring equipment were decontaminated prior to initial use, between sampling locations, and at the completion of daily activities. Reusable material included drill rods, hand-auger, shovel, bladder pump casing, metal soil sampling spoons, Waterra motor check valve, and the water level indicator.

The decontamination procedure included:

- Tap water initial rinse (if needed),
- Tap water and non-phosphate detergent (Alconox™) mixture wash,
- Tap water rinse,
- Distilled water rinse, and
- Final laboratory water rinse.

Laboratory-provided water was procured from Eurofins laboratory of West Sacramento, California. The water is filtered and regularly tested to have no detectable concentrations of PFAS.

D.8 LABORATORY ANALYSES

Samples were submitted to Eurofins laboratory of West Sacramento, California for chemical analysis. Samples were analyzed using EPA Method 537 (modified) and 18 PFAS compounds were reported, as listed below in Exhibit D-13.

Exhibit D-13: Analytes Reported Using EPA Method 537 (Modified)

Abbreviation	Compound
DONA	4,8-Dioxa-3H-perfluorononanoic acid
F-53B Major	9Cl-PF3ONS
F-53B Minor	11Cl-PF3OUdS
HFPO-DA (GenX)	Hexafluoropropylene oxide dimer acid
NEtFOSAA	N-ethylperfluorooctanesulfonamidoacetic acid
NMeFOSAA	N-methylperfluorooctanesulfonamidoacetic acid
PFBS	Perfluorobutanesulfonic acid
PFDA	Perfluorodecanoic acid
PFDoA	Perfluorododecanoic acid
PFHpA	Perfluoroheptanoic acid
PFHxA	Perfluorohexanoic acid
PFHxS	Perfluorohexanesulfonic acid
PFNA	Perfluorononanoic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PFTeA	Perfluorotetradecanoic acid
PFTriA	Perfluorotridecanoic acid
PFUnA	Perfluoroundecanoic acid

D.9 INVESTIGATION-DERIVED WASTE

Investigation-derived waste (IDW) was generated during field activities and included soil cuttings, purge water, decontamination water, and single-use field supplies.

Soil and water were placed into separate drums, sealed, labeled, and temporarily stored on site. Following receipt of analytical results and disposal facility acceptance, the IDW was removed by an appropriately licensed waste transporter. The soil and water were transported for final disposition as non-hazardous waste at Chemical Waste Management's Columbia Ridge Landfill at 17629 Cedar Springs Lane, Arlington, Oregon 97812.

IDW soil and water were disposed during September 2022 and March 2023. The waste manifests and certificates of disposal are provided as Attachment D-1, except the certificate of disposal for the March 2023 disposal is not yet available as of this writing.

Single-use field supplies consisted of used PPE, disposable sampling equipment (tubing, bladders, etc.), and other wastes that originated from Site activities. This IDW was placed in doubled, heavy-duty plastic bags and disposed of in a dumpster at the Shannon & Wilson office.

D.10 SURVEYING

Surveys of exploration locations and elevations were undertaken by a licensed land surveyor. The coordinates and elevations were incorporated into figures and boring logs (Figures D-1 through D-17), and Table 1 of the main report.

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Sheet 1 of 2

Shannon & Wilson uses a soil identification system modified from the Unified Soil Classification System (USCS). Elements of the USCS and other definitions are provided on this and the following page. Soil descriptions are based on visual-manual procedures (ASTM D2488) and laboratory testing procedures (ASTM D2487), if performed.

Structure¹

Interbedded	Alternating layers of varying material or color with layers at least 1/4-inch-thick; singular: bed.
Laminated	Alternating layers of varying material or color with layers less than 1/4-inch-thick; singular: lamination.
Fissured	Breaks along definite planes or fractures with little resistance.
Slickensided	Fracture planes appear polished or glossy; sometimes striated.
Blocky	Cohesive soil that can be broken down into small angular lumps that resist further breakdown.
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay.
Homogeneous	Same color and appearance throughout.

Angularity and Shape¹

Angular	Sharp edges and unpolished planar surfaces.
Subangular	Similar to angular, but with rounded edges.
Subrounded	Nearly planar sides with well-rounded edges.
Rounded	Smoothly curved sides with no edges.
Flat	Width/thickness ratio > 3.
Elongated	Length/width ratio > 3.

Standard Penetration Test (SPT)³

Hammer	140 pounds with a 30-inch free fall. Rope on 6- to 10-inch-diameter cathead 2-1/4 rope turns, > 100 rpm. If automatic hammers are used, blow counts shown on boring logs should be adjusted to account for efficiency of hammer.
Sampler	10 to 30 inches long Shoe I.D. = 1.375 inches Barrel I.D. = 1.5 inches Barrel O.D. = 2 inches
N-Value	Sum blow counts for second and third 6-inch increments. Refusal: 50 blows for 6 inches or less or 10 blows for 0 inch.

Moisture Content

Dry	Absence of moisture, dusty, dry to the touch.
Moist	Damp but no visible water.
Wet	Visible free water, from below water table.

Gradation

Poorly Graded	Narrow range of grain sizes present or, within the range of grain sizes present, one or more sizes are missing (Gap Graded). Meets criteria in ASTM D2487, if tested.
Well-Graded	Full range and even distribution of grain sizes present. Meets criteria in ASTM D2487, if tested.

Cementation¹

Weak	Crumbles/breaks with handling or slight finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

Plasticity²

Nonplastic	Cannot roll a 1/8-in. thread at any water content.	PI < 4
Low	A thread can barely be rolled and a lump cannot be formed when drier than the plastic limit.	4 < PI < 10
Medium	A thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. A lump crumbles when drier than the plastic limit.	10 < PI < 20
High	It takes considerable time rolling and kneading to reach the plastic limit. A thread can be rerolled several times after reaching the plastic limit. A lump can be formed without crumbling when drier than the plastic limit.	PI > 21

Additional Terms

Mottled	Irregular patches of different colors.
Bioturbated	Soil disturbance or mixing by plants or animals.
Diamict	Nonsorted sediment; sand and gravel in silt and/or clay matrix.
Cuttings	Material brought to surface by drilling.
Slough	Material that caved from sides of borehole.
Sheared	Disturbed texture, mix of strengths.

Notes:

¹Reprinted, with permission, from ASTM D2488 - 09a Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428. A copy of the complete standard may be obtained from ASTM International, www.astm.org.

²Adapted, with permission, from ASTM D2488 - 09a Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428. A copy of the complete standard may be obtained from ASTM International, www.astm.org.

³Penetration resistances (N-values) shown on boring logs are as recorded in the field and have not been corrected for hammer efficiency, overburden, or other factors.

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Unified Soil Classification System (USCS)
Modified From USACE Tech Memo 3-357, ASTM D2487, and ASTM D2488

Major Divisions	Symbol	Typical Identifications
Coarse-Grained Soils (more than 50% retained on No. 200 sieve)	Gravels (less than 5% fines)	GW Well-graded Gravel; Well-graded Gravel with Sand
		GP Poorly Graded Gravel; Poorly Graded Gravel with Sand
	Silty or Clayey Gravel (more than 12% fines)	GM Silty Gravel; Silty Gravel with Sand
		GC Clayey Gravel; Clayey Gravel with Sand
	Sand (less than 5% fines)	SW Well-graded Sand; Well-graded Sand with Gravel
		SP Poorly Graded Sand; Poorly Graded Sand with Gravel
	Silty or Clayey Sand (more than 12% fines)	SM Silty Sand; Silty Sand with Gravel
		SC Clayey Sand; Clayey Sand with Gravel
Fine-Grained Soils (50% or more passes the No. 200 sieve)	Silts and Clays (liquid limit less than 50)	ML Inorganic Silt; Silt with Sand or Gravel; Sandy or Gravelly Silt
		CL Organic Lean Clay; Lean Clay with Sand or Gravel; Sandy or Gravelly Lean Clay
	Organic	OL Organic Silt or Clay; Organic Silt or Clay with Sand or Gravel; Sandy or Gravelly Organic Silt or Clay
		MH Elastic Silt; Elastic Silt with Sand or Gravel; Sandy or Gravelly Elastic Silt
	Silts and Clays (liquid limit 50 or more)	CH Inorganic Fat Clay; Fat Clay with Sand or Gravel; Sandy or Gravelly Fat Clay
		OH Organic Organic Silt or Clay; Organic Silt or Clay with Sand or Gravel; Sandy or Gravelly Organic Silt or Clay
Highly Organic Soils	Primarily organic matter, dark in color, and organic odor	PT Peat or other highly organic soils (see ASTM D4427)

Acronyms and Abbreviations

ATD At Time of Drilling	MgO Magnesium Oxide	psi Pounds per Square Inch
Diam. Diameter	mm Millimeter	PVC Polyvinyl Chloride
Elev. Elevation	MnO Manganese Oxide	rpm Rotations per Minute
ft Feet	NA Not Applicable or Not Available	SPT Standard Penetration Test
FeO Iron Oxide	NP Nonplastic	USCS Unified Soil Classification System
gal Gallons	O.D. Outside Diameter	q_u Unconfined Compressive Strength
Horiz. Horizontal	OW Observation Well	VWP Vibrating Wire Piezometer
HSA Hollow-Stem Auger	pcf Pounds per Cubic Foot	Vert. Vertical
I.D. Inside Diameter	PID Photoionization Detector	WOH Weight of Hammer
in Inches	PMT Pressuremeter Test	WOR Weight of Rods
lbs Pounds	ppm Parts per Million	Wt Weight

**Relative Density
Cohesionless Soils**

N, SPT, Blows/ft	Relative Density
< 4	Very loose
4 - 10	Loose
10 - 30	Medium dense
30 - 50	Dense
> 50	Very dense

**Relative Consistency
Cohesive Soils**

N, SPT, Blows/ft	Relative Consistency
< 2	Very soft
2 - 4	Soft
4 - 8	Medium stiff
8 - 15	Stiff
15 - 30	Very stiff
> 30	Hard

Percentages^{1, 2}

Trace	< 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

Well and Backfill Symbols

	Bentonite Cement Grout
	Bentonite Grout
	Bentonite Chips
	Silica Sand
	Perforated or Screened Casing
	Surface Cement Seal
	Asphalt or Cap
	Slough
	Inclinometer or Non-perforated Casing
	Instrumentation Riser or Electrical Lead
	Vibrating Wire Piezometer with Designation

Notes:

Dual symbols (symbols separated by a hyphen, i.e., SP-SM, Sand with Silt) are used for soils with between 5% and 12% fines or when the liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart. Graphics shown on the logs for these soil types are a combination of the two graphic symbols (e.g., SP and SM).

Borderline symbols (symbols separated by a slash, i.e., CL/ML, Lean Clay to Silt; SP-SM/SM, Sand with Silt to Silty Sand) indicate that the soil properties are close to the defining boundary between two groups.

No. 4 size = 4.75 mm = 0.187 in.; No. 200 size = 0.075 mm = 0.003 in.

LOG OF GEOPROBE

Date Started 5/24/22	Location N: 332,656 E: 1,283,057	Ground Elevation: Approx. 565.3 feet
Date Completed 5/24/22		Typical Run Length 5 feet
Total Depth (ft) 30.0	Drilling Company: Holt Services	Hole Diameter: 2.25 inches

Depth (ft)	Probe Run	Soil Description <i>Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.</i>	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
0.4	R-1	Topsoil: Brown, <i>Silty Sand with Gravel (SM)</i> ; moist; fine to coarse, subangular to rounded gravel; fine sand; few organics (roots). (Fill)	0.4					
5	R-2	Brown to gray, <i>Silty Sand with Gravel (SM)</i> ; moist; fine to coarse, subangular to rounded gravel; fine to coarse sand; few moderately cemented clasts of gray, gravelly silt with sand. (Fill)						5
10	R-3	- Pieces of black, burnt wood at 1.3 and 2.0 feet. - Pieces of burnt or decaying wood from 6.4 to 6.7 feet. - Iron oxide staining at 7.8 feet.						10
15	R-4	- Wet from 15.4 to 17.0 feet. Trace burnt pieces from 15.4 to 17.0 feet.	17.0					15
20	R-5	Light gray, <i>Silty Sand with Gravel (SM)</i> ; moist; fine to coarse, subangular to rounded gravel; fine to coarse sand; weakly cemented, becoming sandier with depth. (Weathered Vashon Till [Qvt]?) - Transitions to gray-brown color at 18 feet.						20
25	R-6	- Sandy silt interbed from 25.7 to 26 feet.						25
30		BOTTOM OF GEOPROBE COMPLETED 5/24/2022	30.0					30
35		Well Construction Details: Flush-mount traffic-rated 8-inch metal lid set in a 2x2 foot concrete pad. 3/4-inch diameter, schedule 40 PVC casing with pre-pack screen. Screened interval: 15 to 24.75 feet. Ecology well tag: BPK-751						35
40								40
45								45

NOTES

- In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
- Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
- Refer to KEY for definitions and explanation of symbols.
- CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

2" Plastic Tube - No Soil Recovery	Piezometer Screen and Sand Filter
2" Plastic Tube with Soil Recovery	Bentonite-Cement Grout
Run No.	Bentonite Chips/Pellets
Ground Water Level in Well	Bentonite Grout

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LOG OF GEOPROBE FP-MW1

May 2023

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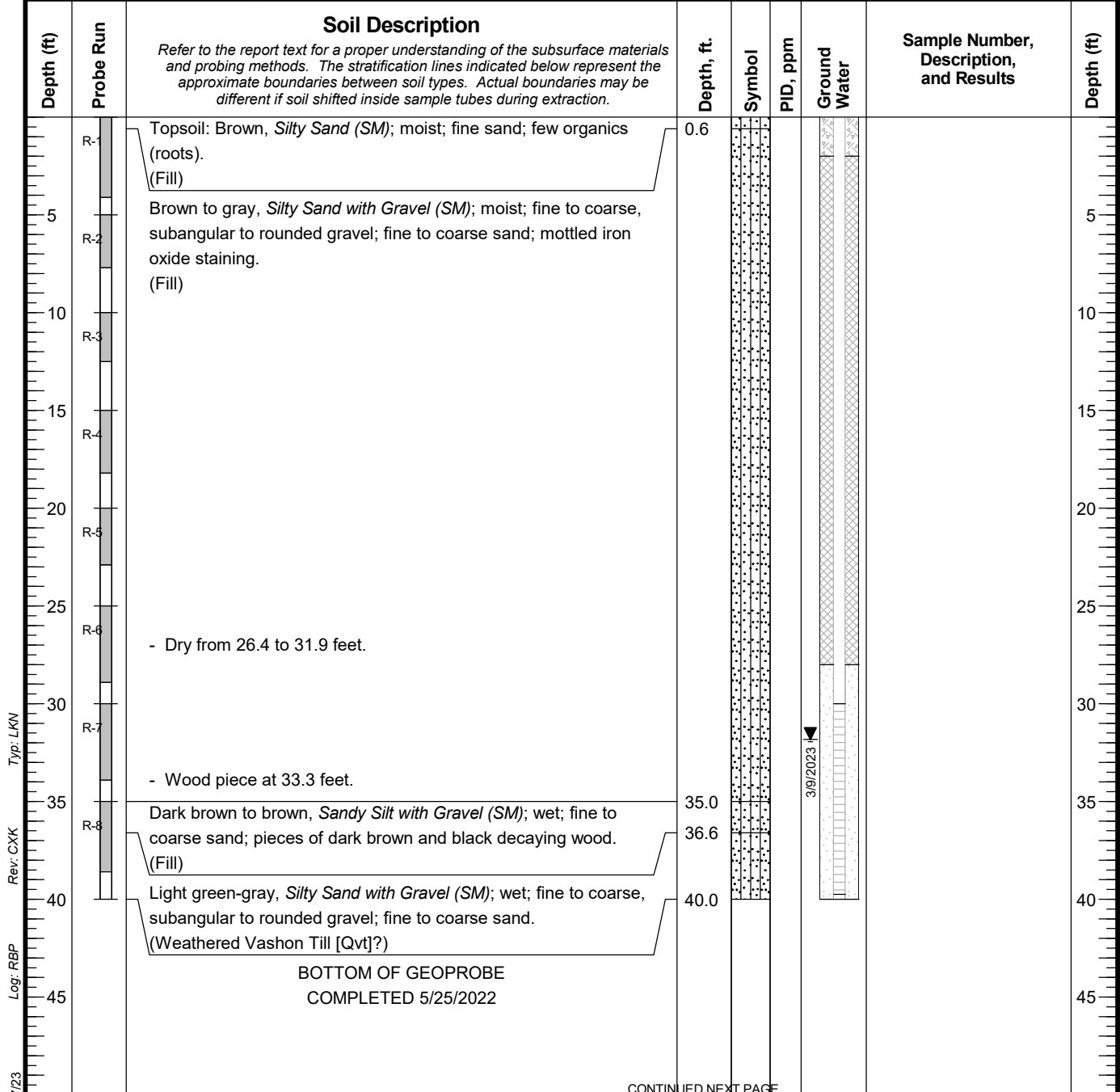
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FIG. D-1

GEOPROBE WELL 102986.GPJ 21-20447.GPJ 4/27/23

LOG OF GEOPROBE

Date Started 5/25/22	Location N: 332,748 E: 1,282,773	Ground Elevation: Approx. 559.8 feet
Date Completed 5/25/22		Typical Run Length 5 feet
Total Depth (ft) 40.0	Drilling Company: Holt Services	Hole Diameter: 2.25 inches



NOTES

- In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
- Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
- Refer to KEY for definitions and explanation of symbols.
- CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

- 2" Plastic Tube - No Soil Recovery
- 2" Plastic Tube with Soil Recovery
- Run No.
- Ground Water Level in Well
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout

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LOG OF GEOPROBE FP-MW2

May 2023

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FIG. D-2
Sheet 1 of 2

LOG OF GEOPROBE

Date Started 5/25/22	Location N: 332,748 E: 1,282,773	Ground Elevation: Approx. 559.8 feet
Date Completed 5/25/22		Typical Run Length 5 feet
Total Depth (ft) 40.0	Drilling Company: Holt Services	Hole Diameter: 2.25 inches

Depth (ft)	Probe Run	Soil Description <i>Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.</i>	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
55		Well Construction Details: Flush-mount traffic-rated 8-inch metal lid set in a 2x2 foot concrete pad. 3/4-inch diameter, schedule 40 PVC casing with pre-pack screen. Screened interval: 30 to 39.75 feet. Ecology well tag: BPK-752						55
60								60
65								65
70								70
75								75
80								80
85								85
90								90
95								95

NOTES

- In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
- Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
- Refer to KEY for definitions and explanation of symbols.
- CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

	2" Plastic Tube - No Soil Recovery		Piezometer Screen and Sand Filter
	2" Plastic Tube with Soil Recovery		Bentonite-Cement Grout
	Ground Water Level in Well		Bentonite Chips/Pellets
			Bentonite Grout

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LOG OF GEOPROBE FP-MW2

May 2023

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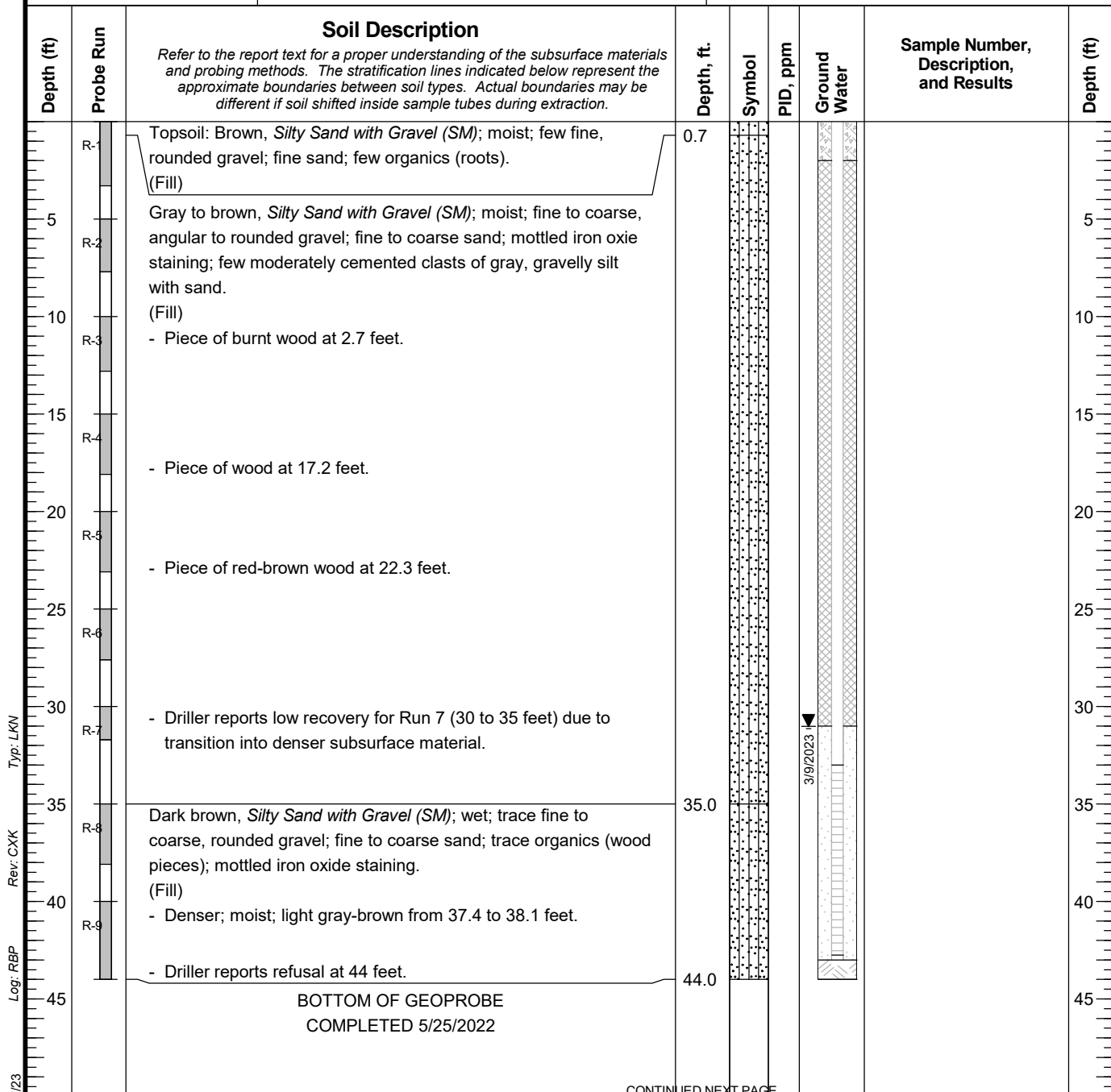
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FIG. D-2
Sheet 2 of 2

GEOPROBE WELL 102986.GPJ 21-20447.GPJ 4/27/23 Typ: LKN Rev: CXK Log: RBP

LOG OF GEOPROBE

Date Started	5/25/22	Location	N: 332,547 E: 1,282,759	Ground Elevation:	Approx. 559.6 feet
Date Completed	5/25/22			Typical Run Length	5 feet
Total Depth (ft)	44.0	Drilling Company:	Holt Services	Hole Diameter:	2.25 inches



NOTES

- In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
- Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
- Refer to KEY for definitions and explanation of symbols.
- CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

	2" Plastic Tube - No Soil Recovery		Piezometer Screen and Sand Filter
	2" Plastic Tube with Soil Recovery		Bentonite-Cement Grout
	Run No.		Bentonite Chips/Pellets
	Ground Water Level in Well		Bentonite Grout

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LOG OF GEOPROBE FP-MW3

May 2023

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FIG. D-3
Sheet 1 of 2

LOG OF GEOPROBE

Date Started 5/25/22	Location N: 332,547 E: 1,282,759	Ground Elevation: Approx. 559.6 feet
Date Completed 5/25/22		Typical Run Length 5 feet
Total Depth (ft) 44.0	Drilling Company: Holt Services	Hole Diameter: 2.25 inches

Depth (ft)	Probe Run	Soil Description <i>Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.</i>	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
55		Well Construction Details: Flush-mount traffic-rated 8-inch metal lid set in a 2x2 foot concrete pad. 3/4-inch diameter, schedule 40 PVC casing with pre-pack screen. Screened interval: 33 to 42.75 feet. Ecology well tag: BPK-753						55
60								60
65								65
70								70
75								75
80								80
85								85
90								90
95								95

NOTES

- In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
- Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
- Refer to KEY for definitions and explanation of symbols.
- CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

 2" Plastic Tube - No Soil Recovery	 Piezometer Screen and Sand Filter
 2" Plastic Tube with Soil Recovery	 Bentonite-Cement Grout
 Run No.	 Bentonite Chips/Pellets
	 Bentonite Grout

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LOG OF GEOPROBE FP-MW3

May 2023

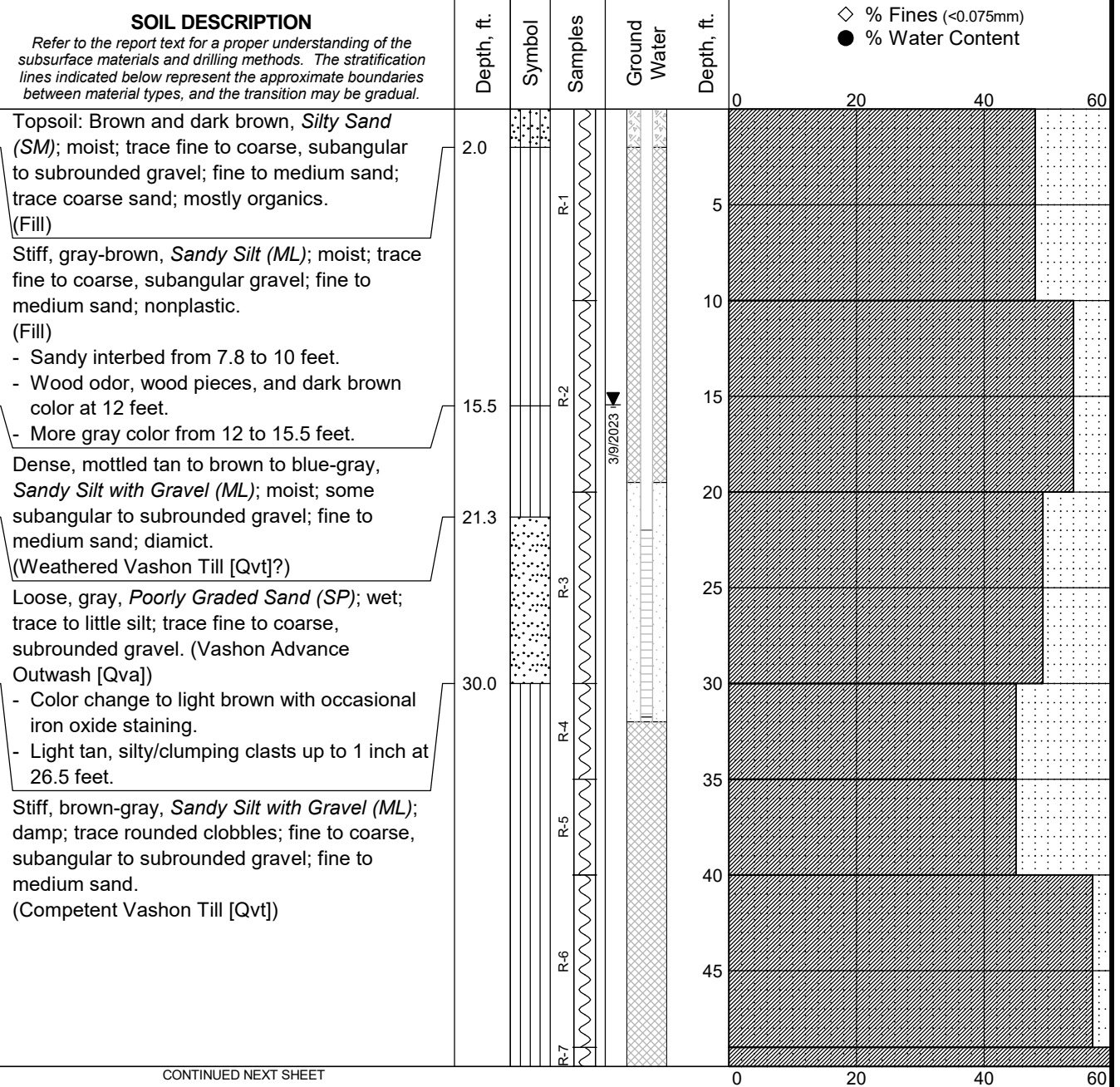
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FIG. D-3
Sheet 2 of 2

GEOPROBE WELL 102986.GPJ 21-20447.GPJ 4/27/23 Typ: LKN Rev: CXK Log: RBP

Total Depth: <u>105 ft.</u>	Latitude: <u>332,716 ft.</u>	Drilling Method: <u>Sonic Core</u>	Hole Diam.: <u>6 in.</u>
Top Elevation: <u>566.4 ft.</u>	Longitude: <u>1,283,101 ft.</u>	Drilling Company: <u>Holt Services</u>	Rod Diam.: _____
Vert. Datum: _____	Station: <u>N/A</u>	Drill Rig Equipment: <u>Terra Sonic 150CC</u>	Hammer Type: _____
Horiz. Datum: _____	Offset: <u>N/A</u>	Other Comments: _____	



CONTINUED NEXT SHEET

LEGEND

* Sample Not Recovered	Well Screen and Sand Filter
Soil Core (as in Sonic Core Borings)	Bentonite-Cement Grout
	Bentonite Chips/Pellets
	Bentonite Grout
	Ground Water Level in Well

NOTES

- Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
- Groundwater level, if indicated above, is for the date specified and may vary.
- USCS designation is based on visual-manual classification and selected lab testing.

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LOG OF SONIC BORING FP-MW4

May 2023

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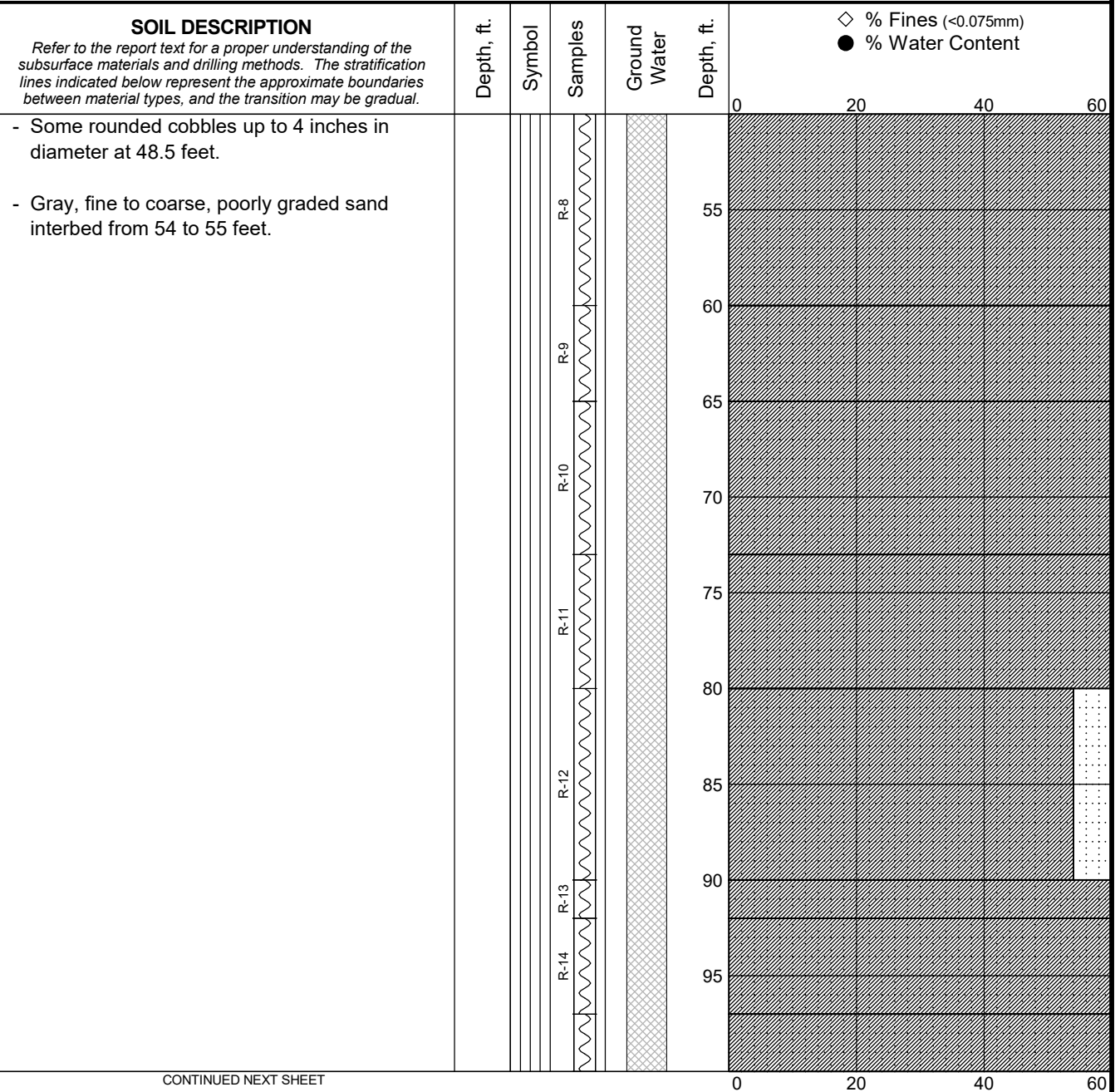
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FIG. D-4
Sheet 1 of 3

VERSION 1
FINAL

MASTER LOG E 102986.GPJ SHAN WIL GDT 4/27/23 Log: RBP Rev: CXX Typ: LKN

Total Depth: <u>105 ft.</u>	Latitude: <u>332,716 ft.</u>	Drilling Method: <u>Sonic Core</u>	Hole Diam.: <u>6 in.</u>
Top Elevation: <u>566.4 ft.</u>	Longitude: <u>1,283,101 ft.</u>	Drilling Company: <u>Holt Services</u>	Rod Diam.: _____
Vert. Datum: _____	Station: <u>N/A</u>	Drill Rig Equipment: <u>Terra Sonic 150CC</u>	Hammer Type: _____
Horiz. Datum: _____	Offset: <u>N/A</u>	Other Comments: _____	



CONTINUED NEXT SHEET

LEGEND

* Sample Not Recovered	 Well Screen and Sand Filter
 Soil Core (as in Sonic Core Borings)	 Bentonite-Cement Grout
	 Bentonite Chips/Pellets
	 Bentonite Grout
	 Ground Water Level in Well

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

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LOG OF SONIC BORING FP-MW4

May 2023

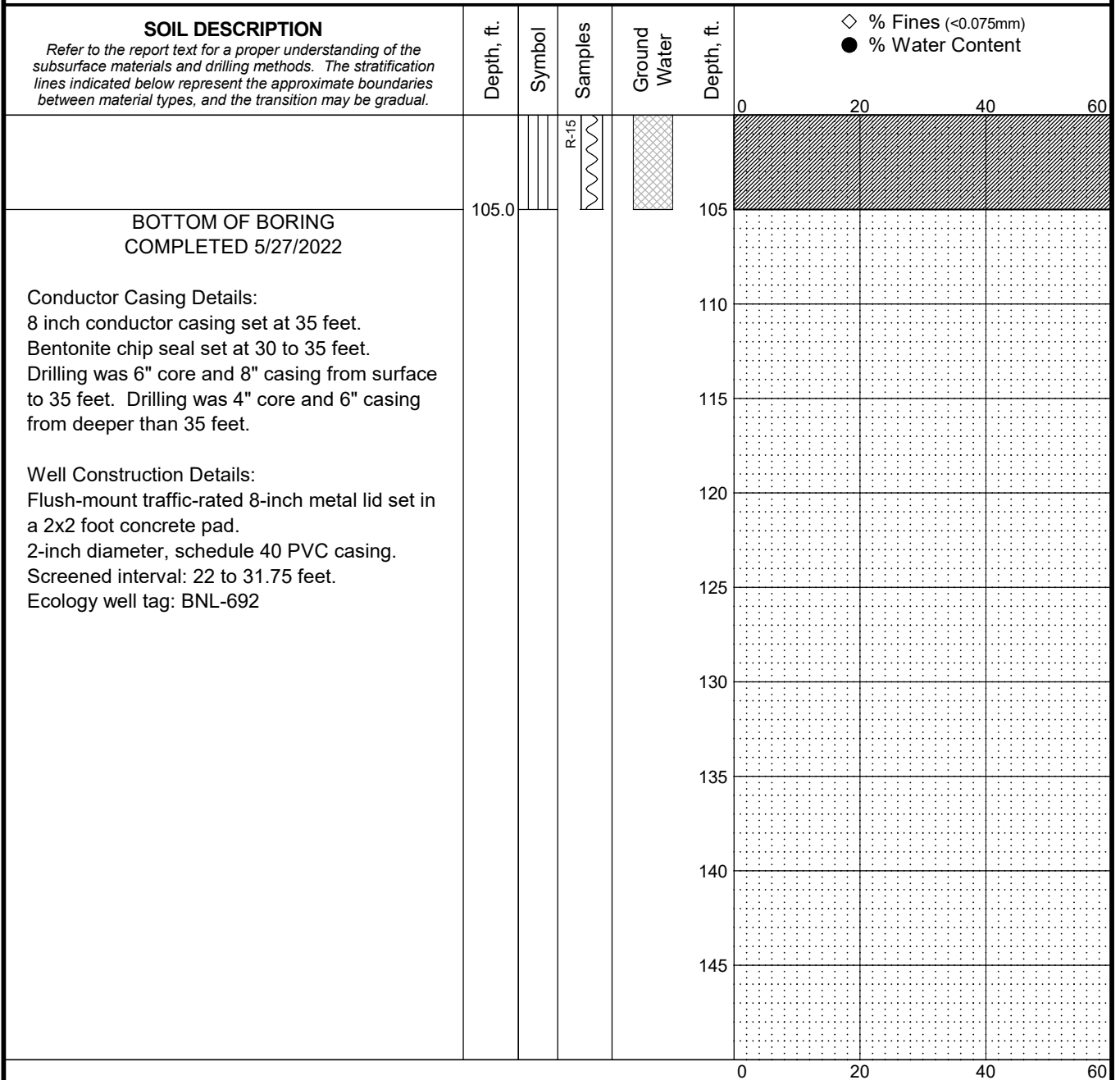
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FIG. D-4
Sheet 2 of 3

MASTER LOG E 102986.GPJ SHAN WIL GDT 4/27/23 Log: RBP Rev: CXK Typ: LKN

Total Depth: <u>105 ft.</u>	Latitude: <u>332,716 ft.</u>	Drilling Method: <u>Sonic Core</u>	Hole Diam.: <u>6 in.</u>
Top Elevation: <u>566.4 ft.</u>	Longitude: <u>1,283,101 ft.</u>	Drilling Company: <u>Holt Services</u>	Rod Diam.: _____
Vert. Datum: _____	Station: <u>N/A</u>	Drill Rig Equipment: <u>Terra Sonic 150CC</u>	Hammer Type: _____
Horiz. Datum: _____	Offset: <u>N/A</u>	Other Comments: _____	



- LEGEND**
- | | | |
|--------------------------------------|--|-----------------------------|
| * Sample Not Recovered | | Well Screen and Sand Filter |
| Soil Core (as in Sonic Core Borings) | | Bentonite-Cement Grout |
| | | Bentonite Chips/Pellets |
| | | Bentonite Grout |
| | | Ground Water Level in Well |

- NOTES**
1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
 2. Groundwater level, if indicated above, is for the date specified and may vary.
 3. USCS designation is based on visual-manual classification and selected lab testing.

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LOG OF SONIC BORING FP-MW4

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FIG. D-4
Sheet 3 of 3

MASTER LOG E 102986.GPJ SHAN WIL GDT 4/27/23 Log: RBP Rev: CXK Typ: LKN

LOG OF GEOPROBE

Date Started 10/24/22	Location N: 332,798 E: 1,282,482	Ground Elevation: Approx. 523.4 feet
Date Completed 10/24/22		Typical Run Length 5 feet
Total Depth (ft) 22.0	Drilling Company: Holt Services	Hole Diameter: 3.75 inches

Depth (ft)	Probe Run	Soil Description <i>Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.</i>	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
0.5	R-1	Asphalt pavement.	0.5					
5	R-2	Brown to gray-brown, <i>Poorly Graded Sand (SP)</i> ; moist; trace subangular to subrounded gravel; fine to coarse sand; trace silt; trace iron oxide staining. (Fill)						
10.7	R-3	Gray, <i>Silty Sand with Gravel (SM)</i> ; moist; fine to coarse, subrounded gravel; fine to coarse sand; nonplastic to low plasticity; trace iron oxide staining; diamict. (Weathered Till [Qvt]?)	10.7					
15.9	R-4	- Slightly wet from 10.7 to 11.2 feet. - 1-inch-thick light grayish-brown, silty sand layers from 11.2 to 11.3 feet and 11.6 to 11.7 feet. - Wet at 15 feet.	15.9					
22.0	R-5	Very dense, light grayish-brown, <i>Silty Sand with Gravel (SM)</i> ; moist; fine to coarse, subrounded gravel; fine to coarse sand; nonplastic to low plasticity; trace iron oxide staining; (Weathered Vashon Till [Qvt]?). - Driller reported refusal at 22 feet.	22.0					
		BOTTOM OF GEOPROBE COMPLETED 11/24/2022						
		Well Construction Details: Borehole overdrilled with 3.75-inch diameter probe prior to installation of well. Flush-mount traffic-rated 8-inch metal lid set in concrete. 2-inch diameter, schedule 40 PVC casing. 10-slot pre-pack screen with No. 12x20 sand filter. Screened interval: 8.7 to 18.5 feet. Ecology well tag: BPL-660						

NOTES

- In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
- Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
- Refer to KEY for definitions and explanation of symbols.
- CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

2" Plastic Tube - No Soil Recovery	Piezometer Screen and Sand Filter
2" Plastic Tube with Soil Recovery	Bentonite-Cement Grout
Run No.	Bentonite Chips/Pellets
Ground Water Level in Well	Bentonite Grout

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LOG OF GEOPROBE FP-MW5

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FIG. D-5

LOG OF GEOPROBE

Date Started 10/24/22	Location N: 332,650 E: 1,282,494	Ground Elevation: Approx. 522.2 feet
Date Completed 10/24/22		Typical Run Length 5 feet
Total Depth (ft) 15.0	Drilling Company: Holt Services	Hole Diameter: 3.75 inches

Depth (ft)	Probe Run	Soil Description <i>Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.</i>	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
0.4	R-1	Asphalt pavement.	0.4					
1.0		Brown, <i>Silty Sand with Gravel (SM)</i> ; moist; fine to coarse, subangular gravel; fine to coarse sand. (Fill)	1.0					
3.0			3.0					
5.0	R-2	Brown, <i>Poorly Graded Sand (SP)</i> ; moist; trace fine gravel; fine to coarse sand; trace fines. (Fill)	5.0					5
11.5	R-3	Dense, gray, <i>Silty Sand with Gravel (SM)</i> ; moist; fine, subrounded gravel; fine to coarse sand; nonplastic to low plasticity; socketing; trace iron oxide staining. (Fill)	11.5					10
15.0	R-4	Dense to very dense, gray-brown, <i>Silty Sand with Gravel (SM)</i> ; moist; fine to coarse gravel; fine to coarse sand; nonplastic to low plasticity; trace iron oxide staining. (Fill)	15.0					15
20		Very dense, gray to gray-brown, <i>Silty Sand with Gravel (SM)</i> ; moist; fine to coarse gravel; fine to coarse sand; (Weathered Vashon Till (Qvt) / Diamict?).						20
25		- Initial refusal at 11.5 feet. Second attempt advanced to 15 feet.						25
30		- Brown from 12.5 to 14.5 feet.						30
35								35
40								40
45								45

BOTTOM OF GEOPROBE
COMPLETED 10/24/2022

Well Construction Details:
Borehole diameter 2.25 inches.
Flush-mount traffic-rated 8-inch metal lid set in concrete.
3/4-inch diameter, schedule 40 PVC casing.
10-slot pre-pack screen with No. 12x20 sand filter.
Screened interval: 4 to 13.8 feet.
Ecology well tag: BPL-661

NOTES

- In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
- Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
- Refer to KEY for definitions and explanation of symbols.
- CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

	2" Plastic Tube - No Soil Recovery		Piezometer Screen and Sand Filter
	2" Plastic Tube with Soil Recovery		Bentonite-Cement Grout
	Ground Water Level in Well		Bentonite Chips/Pellets
			Bentonite Grout

Former Fire Training Pit
Snohomish County Airport
Everett, Washington

LOG OF GEOPROBE FP-MW6

May 2023

102986

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FIG. D-6

Typ: LKN
Rev: JXS
Log: MRH

GEOPROBE WELL 102986.GPJ 21-20447.GPJ 4/27/23

LOG OF GEOPROBE

Date Started 5/23/22	Location N: 333,543 E: 1,283,754	Ground Elevation: Approx. 571.7 feet
Date Completed 5/23/22		Typical Run Length 5 feet
Total Depth (ft) 20.0	Drilling Company: Holt Services	Hole Diameter: 2.25 inches

Depth (ft)	Probe Run	Soil Description <i>Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.</i>	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
0.2	R-1	Topsoil: Brown, <i>Silty Sand (SM)</i> ; moist; fine sand; few organics (roots). (Fill)	0.2					
5	R-2	Brown to gray, <i>Sandy Silt with Gravel (ML)</i> ; moist; fine to coarse, subrounded to rounded gravel; fine to coarse sand; few moderately cemented clasts of gray, gravelly silt with sand. (Fill)						5
10	R-3	- Brown and wet from 10.2 to 13 feet.						10
11.7		Gray, <i>Silty Sand with Gravel (SM)</i> ; wet; fine to coarse, rounded gravel; fine to coarse sand; trace iron oxide mottling. (Fill?)	11.7					11.7
13.4	R-4	Light gray, <i>Gravelly Silt with Sand (ML)</i> ; moist; fine to coarse, subrounded to rounded gravel; fine to coarse sand; becoming sandier with depth.	13.4					13.4
20.0		(Weathered Vashon Till [Qvt]) - Driller reported Run 4 (15 to 20 feet) much denser, likely till.	20.0					20.0
		BOTTOM OF GEOPROBE COMPLETED 5/23/2022						

NOTES

- In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
- Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
- Refer to KEY for definitions and explanation of symbols.
- CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

-  2" Plastic Tube - No Soil Recovery
 2" Plastic Tube with Soil Recovery
 Run No.
 Ground Water Level ATD

Former Fire Training Pit
Snohomish County Airport
Everett, Washington

LOG OF GEOPROBE FP-P1

May 2023

102986

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FIG. D-7

GEOPROBE WELL 102986.GPJ 21-20447.GPJ 4/27/23

LOG OF GEOPROBE

Date Started	5/23/22	Location	N: 333,392 E: 1,283,648	Ground Elevation:	Approx. 571.7 feet
Date Completed	5/23/22			Typical Run Length	5 feet
Total Depth (ft)	15.8	Drilling Company:	Holt Services	Hole Diameter:	2.25 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
		Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.						
	R-1	Topsoil: Brown, <i>Silty Sand (SM)</i> ; moist; fine sand; some organics (roots). (Fill)	0.3					
5	R-2	Brown and gray, <i>Sandy Silt with Gravel (ML)</i> ; moist; fine to coarse, subangular to rounded gravel; fine to coarse sand; few moderately cemented clasts of gray, gravelly silt with sand; mottled iron oxide staining. (Fill)	6.6					5
10	R-3	- Some dark brown organic soil at 5.3 feet. - Strong iron oxide staining from 5.3 to 6.6 feet.	10.6					10
15	R-4	Gray, <i>Silty Sand with Gravel (SM)</i> ; wet; fine to coarse, rounded gravel; fine to coarse sand. (Fill)	15.8					15
20		Light gray, <i>Gravelly Silt with Sand (ML)</i> ; moist; fine to coarse, subangular to rounded gravel; fine to coarse sand. (Weathered Vashon Till [Qvt]) - Driller reports denser material from 13 to 15.8 feet.						20
25		BOTTOM OF GEOPROBE COMPLETED 5/23/2022						25
30								30
35								35
40								40
45								45

NOTES

- In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
- Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
- Refer to KEY for definitions and explanation of symbols.
- CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND



2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

Run No.

Ground Water Level ATD

Former Fire Training Pit
Snohomish County Airport
Everett, Washington

LOG OF GEOPROBE FP-P2

May 2023

102986

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FIG. D-8

GEOPROBE WELL 102986.GPJ 21-20447.GPJ 4/27/23

LOG OF GEOPROBE

Date Started	5/23/22	Location	N: 333,227 E: 1,283,609	Ground Elevation:	Approx. 572.8 feet
Date Completed	5/23/22			Typical Run Length	5 feet
Total Depth (ft)	20.0	Drilling Company:	Holt Services	Hole Diameter:	2.25 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
		Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.						
	R-1	Topsoil: Brown, <i>Silty Sand (SM)</i> ; moist; fine sand; few organics (roots).	0.2					
		(Fill)	1.2					
5		- Piece of asphalt at 0.1 foot.	1.4					
	R-2	Dark gray, <i>Poorly Graded Sand with Gravel (SP)</i> ; moist; fine to coarse, angular to rounded gravel; fine to coarse sand.	6.3					5
		(Fill)						
10	R-3	Dark brown, <i>Organic Soil (OL/OH)</i> ; moist.						10
		(Fill)						
15	R-4	Brown to gray, <i>Sandy Silt with Gravel (ML)</i> ; moist; fine to coarse, subrounded to rounded gravel; fine to coarse sand; few moderately cemented clats of gray, gravelly silt with sand; mottled iron oxide staining.	14.7					15
		(Fill)						
20		- Strong iron oxide staining from 5.4 to 7.5 feet.	20.0					20
		Light brown to gray, <i>Silty Sand with Gravel (SM)</i> ; moist to wet; fine to coarse, subangular to rounded gravel; fine to coarse sand; trace iron oxide staining.						
25		(Fill)						25
		- Sandier from 10 to 11.5 feet.						
30		Light gray, <i>Gravelly Silt with Sand (ML)</i> ; moist; fine to coarse, subangular to rounded gravel; fine to coarse sand.						30
		(Weathered Vashon Till [Qvt]?)						
		BOTTOM OF GEOPROBE						
		COMPLETED 5/23/2022						

NOTES

- In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
- Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
- Refer to KEY for definitions and explanation of symbols.
- CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

-  2" Plastic Tube - No Soil Recovery
 2" Plastic Tube with Soil Recovery
 Run No.
 Ground Water Level ATD

Former Fire Training Pit
Snohomish County Airport
Everett, Washington

LOG OF GEOPROBE FP-P3

May 2023

102986

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FIG. D-9

GEOPROBE WELL 102986.GPJ 21-20447.GPJ 4/27/23

LOG OF GEOPROBE

Date Started 5/23/22	Location N: 332,933 E: 1,283,157	Ground Elevation: Approx. 565.8 feet
Date Completed 5/23/22		Typical Run Length 5 feet
Total Depth (ft) 25.0	Drilling Company: Holt Services	Hole Diameter: 2.25 inches

Depth (ft)	Probe Run	Soil Description <i>Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.</i>	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
0.5	R-1	Topsoil: Brown, <i>Silty Sand (SM)</i> ; moist; fine sand; few organics (roots). (Fill)	0.5					
5	R-2	Gray-brown, <i>Sandy Silt (ML)</i> ; moist; trace fine to coarse, angular to rounded gravel; fine to coarse sand; little iron oxide staining; trace pieces of black burnt wood and black silt. (Fill)						5
10	R-3							10
15	R-4	- 2-inch interbed of clay with iron oxide staining at 11.6 feet.						15
16.4			16.4					16.4
20	R-5	Dark brown <i>Silt with Sand (ML)</i> ; moist; trace fine to coarse, rounded gravel; fine to coarse sand; some wood pieces (roots and branches). (Fill)						20
25		- Transitions to olive color and wet at 20 feet.						25
25.0			25.0					25.0
		BOTTOM OF GEOPROBE COMPLETED 5/23/2022						

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

-  2" Plastic Tube - No Soil Recovery
 2" Plastic Tube with Soil Recovery
 Run No.

Former Fire Training Pit
Snohomish County Airport
Everett, Washington

LOG OF GEOPROBE FP-P4

May 2023

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FIG. D-10

GEOPROBE WELL 102986.GPJ 21-20447.GPJ 4/27/23

LOG OF GEOPROBE

Date Started 5/24/22	Location N: 332,886 E: 1,283,280	Ground Elevation: Approx. 568.0 feet
Date Completed 5/24/22		Typical Run Length 5 feet
Total Depth (ft) 22.0	Drilling Company: Holt Services	Hole Diameter: 2.25 inches

Depth (ft)	Probe Run	Soil Description <i>Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.</i>	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
1.1	R-1	Topsoil: Brown, <i>Silty Sand (SM)</i> ; moist; fine sand; little organics (roots). (Fill)	1.1					
5	R-2	Brown to gray, <i>Silty Sand (ML)</i> ; moist; little fine to coarse, angular to rounded gravel; fine to coarse sand; few areas of iron oxide staining. (Fill)						5
10	R-3	- Dark brown silt interbed at 1.1 and 1.6 feet.						10
15	R-4	- Piece of black, burnt wood at 11.4 feet.						15
20	R-5	- Driller reported no recovery from 15 to 20 feet due to wet soil sliding out of the core barrel.						20
22.0		BOTTOM OF GEOPROBE COMPLETED 5/24/2022	22.0					25
25								30
30								35
35								40
40								45
45								

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

-  2" Plastic Tube - No Soil Recovery
 2" Plastic Tube with Soil Recovery
 Ground Water Level ATD

Former Fire Training Pit
Snohomish County Airport
Everett, Washington

LOG OF GEOPROBE FP-P5

May 2023

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FIG. D-11

GEOPROBE WELL 102986.GPJ 21-20447.GPJ 4/27/23 Typ: LKN Rev: CXK Log: RBP

LOG OF GEOPROBE

Date Started 5/24/22	Location N: 332,825 E: 1,283,021	Ground Elevation: Approx. 564.2 feet
Date Completed 5/24/22		Typical Run Length 5 feet
Total Depth (ft) 20.0	Drilling Company: Holt Services	Hole Diameter: 2.25 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
		<i>Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.</i>						
	R-1	Topsoil: Brown, <i>Silty Sand (SM)</i> ; moist; fine sand; some organics (roots). (Fill)	0.5					
			2.9					
5	R-2	Brown to gray, <i>Silty Sand with Gravel (SM)</i> ; moist; fine to coarse, angular to rounded gravel; fine to coarse sand. (Fill)	3.2					5
		- Dark brown wood pieces at 2.5 feet.						
10	R-3	Gray, <i>Silt (ML)</i> ; moist; trace fine sand; some iron oxide staining. (Fill)						10
		Brown to gray, <i>Silt with Sand and Gravel (ML)</i> ; moist; fine to coarse, subangular to rounded gravel; fine to coarse sand. (Fill)						
15	R-4	- Transitions to gray at 7.7 feet. - Piece of black, burnt wood at 3.4, 5.6, and 13.2 feet. - Wet at 15 feet and deeper.	16.0					15
			18.0					
20		Brown, <i>Silty Sand (SM)</i> ; wet; fine to coarse sand; some roots and black wood. (Fill)	20.0					20
25		Light gray, <i>Silt with Sand and Gravel (SM)</i> ; moist; fine to coarse, angular to rounded gravel; fine to coarse sand. (Weathered Vashon Till [Qvt]?)						25
30								30
35								35
40								40
45								45

BOTTOM OF GEOPROBE
COMPLETED 5/24/2022

NOTES

- In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
- Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
- Refer to KEY for definitions and explanation of symbols.
- CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

-  2" Plastic Tube - No Soil Recovery
 2" Plastic Tube with Soil Recovery
 Run No.
 Ground Water Level ATD

Former Fire Training Pit
Snohomish County Airport
Everett, Washington

LOG OF GEOPROBE FP-P6

May 2023

102986

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Geotechnical and Environmental Consultants

FIG. D-12

LOG OF GEOPROBE

Date Started 5/24/22	Location N: 332,764 E: 1,283,095	Ground Elevation: Approx. 565.9 feet
Date Completed 5/24/22		Typical Run Length 5 feet
Total Depth (ft) 20.0	Drilling Company: Holt Services	Hole Diameter: 2.25 inches

Depth (ft)	Probe Run	Soil Description <i>Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.</i>	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
0.8	R-1	Topsoil: Brown, <i>Silty Sand (SM)</i> ; moist; fine sand; little organics (roots). (Fill)	0.8					
5	R-2	Brown to gray, <i>Silty Sand with Gravel (SM)</i> ; moist; fine to coarse sand; fine to coarse, subangular to rounded gravel. (Fill) - Strong iron oxide staining at 2.8 feet. - Pieces of tree bark at 5.3 feet.	11.0			Water Level Not Determined		5
10	R-3	Olive, <i>Silty Sand with Gravel (SM)</i> ; moist; fine to coarse, rounded to subangular gravel, fine to coarse sand; some pieces of burnt and unburnt wood; apparent increase in moisture content from 11.0 to 16.4 feet. (Fill)	16.4					10
15	R-4	Light gray, <i>Silty Sand with Gravel (SM)</i> ; moist; fine to coarse, angular to rounded gravel; fine to coarse sand. (Fill) - Transitions to gray-brown at 16.8 feet. - Iron-oxide stained veins and clasts from 18.1 to 20 feet.	20.0					15
20		BOTTOM OF GEOPROBE COMPLETED 5/24/2022						20
25								25
30								30
35								35
40								40
45								45

NOTES

- In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
- Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
- Refer to KEY for definitions and explanation of symbols.
- CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

-  2" Plastic Tube - No Soil Recovery
 2" Plastic Tube with Soil Recovery
 Run No.

Former Fire Training Pit
Snohomish County Airport
Everett, Washington

LOG OF GEOPROBE FP-P7

May 2023

102986

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FIG. D-13

GEOPROBE WELL 102986.GPJ 21-20447.GPJ 4/27/23

LOG OF GEOPROBE

Date Started 5/24/22	Location N: 332,627 E: 1,282,967	Ground Elevation: Approx. 563.8 feet
Date Completed 5/24/22		Typical Run Length 5 feet
Total Depth (ft) 20.0	Drilling Company: Holt Services	Hole Diameter: 2.25 inches

Depth (ft)	Probe Run	Soil Description <i>Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.</i>	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
0.5	R-1	Topsoil: Brown, <i>Silty Sand (SM)</i> ; moist; fine sand; few organics (roots). (Fill)	0.5					
5	R-2	Brown to gray, <i>Silty Sand with Gravel (SM)</i> ; moist; fine to coarse, subangular to rounded gravel; fine to coarse sand; mottled iron oxide staining; few moderately cemented clasts of gray, gravelly silt with sand. (Fill)						
10	R-3	- Pieces of black, burnt, or decaying wood at 1.5 and 6.3 feet.						
15	R-4	Light gray, <i>Silty Sand (SM)</i> ; dry; fine to coarse sand. (Fill)	15.5					
17.0		- 1-inch piece of red brick at 17 feet.	17.0					
20		Light brown, <i>Silty Sand with Gravel (SM)</i> ; moist; fine to coarse, subangular to rounded gravel. (Fill)	20.0					
25		BOTTOM OF GEOPROBE COMPLETED 5/24/2022						

NOTES

- In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
- Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
- Refer to KEY for definitions and explanation of symbols.
- CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

-  2" Plastic Tube - No Soil Recovery
 2" Plastic Tube with Soil Recovery
 Run No.

Former Fire Training Pit
Snohomish County Airport
Everett, Washington

LOG OF GEOPROBE FP-P8

May 2023

102986

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FIG. D-14

LOG OF GEOPROBE

Date Started 5/23/22	Location N: 332,660 E: 1,283,622	Ground Elevation: Approx. 572.2 feet
Date Completed 5/23/22		Typical Run Length 5 feet
Total Depth (ft) 25.0	Drilling Company: Holt Services	Hole Diameter: 2.25 inches

Depth (ft)	Probe Run	Soil Description <i>Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.</i>	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
0	R-1	Brown, <i>Silty Sand and Gravel (SM)</i> ; moist; trace fine, subangular gravel; fine sand; trace organics (roots) from 0.0 to 0.2 feet. (Fill)	2.8					0
5	R-2	Light gray <i>Silt with Sand (ML)</i> ; moist; trace fine, subangular gravel; fine to coarse sand; few moderately cemented clasts of gray, gravelly silt with sand. (Fill)						5
10	R-3	- Piece of dark brown wood at 2.8 feet. - Some fine to coarse, subangular to rounded gravel from 5.5 to 7 feet.						10
15	R-4	- Some dark brown wood pieces at 6.5 feet. - Coarse, subrounded gravel at 10.1 feet. - Dark brown wood piece at 15 feet.	15.0					15
20	R-5	Light gray-brown, <i>Silty Sand with Gravel (SM)</i> ; wet; fine to coarse, subangular to rounded gravel; fine to coarse sand; trace clay; mottled iron oxide staining. - Driller reports from 20 to 25 feet is denser/more consolidated.						20
25			25.0					25
30								30
35								35
40								40
45								45

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND



2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

Run No.



Ground Water Level ATD

Former Fire Training Pit
Snohomish County Airport
Everett, Washington

LOG OF GEOPROBE FP-P9

May 2023

102986

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FIG. D-15

GEOPROBE WELL 102986.GPJ 21-20447.GPJ 4/27/23 Typ: LKN Rev: CXK Log: RBP

LOG OF GEOPROBE

Date Started 10/24/22	Location N: 332,994 E: 1,282,482	Ground Elevation: Approx. 527.0 feet
Date Completed 10/24/22		Typical Run Length 5 feet
Total Depth (ft) 15.0	Drilling Company: Holt Services	Hole Diameter: 2.25 inches

Depth (ft)	Probe Run	Soil Description <i>Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.</i>	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
0.6	R-1	Asphalt pavement.	0.6					
3.1		Light gray-brown, <i>Silty Sand with Gravel (SM)</i> ; moist; fine, subangular to subrounded gravel; fine to coarse sand; nonplastic to low plasticity; trace iron oxide staining. (Fill)	3.1					
5	R-2	Dense, gray-brown, <i>Silty Sand with Gravel (SM)</i> ; moist; fine, subrounded gravel; fine to coarse sand; nonplastic to low plasticity; trace iron oxide staining. (Fill)						5
10		- Sand lens from 6 to 6.1 feet.						10
13.0	R-3	- Becomes very dense and siltier (diamict) at 9 feet.	13.0					
15.0		Very dense, gray, <i>Silty Sand with Gravel (SM)</i> ; moist; fine to coarse, subrounded gravel; fine to coarse sand; nonplastic to low plasticity; trace iron oxide staining; diamict, (Weathered Vashon Till [Qvt]?).	15.0					15
20		- Driller reports refusal at 15 feet.						20
25								25
30								30
35								35
40								40
45								45

BOTTOM OF GEOPROBE
COMPLETED 10/24/2022

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND



2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

Run No.

Former Fire Training Pit
Snohomish County Airport
Everett, Washington

LOG OF GEOPROBE FP-P10

May 2023

102986

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. D-16

LOG OF GEOPROBE

Date Started 10/24/22	Location N: 332,388 E: 1,282,516	Ground Elevation: Approx. 523.5 feet
Date Completed 10/24/22		Typical Run Length 5 feet
Total Depth (ft) 12.0	Drilling Company: Holt Services	Hole Diameter: 2.25 inches

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number, Description, and Results	Depth (ft)
		<i>Refer to the report text for a proper understanding of the subsurface materials and probing methods. The stratification lines indicated below represent the approximate boundaries between soil types. Actual boundaries may be different if soil shifted inside sample tubes during extraction.</i>						
	R-1	Brown, <i>Silty Sand to Sandy Silt with Organics (SM)</i> ; moist; organic-rich; fine roots; grass. (Fill)	0.6					
			1.3					
5	R-2	Brown, <i>Silty Sand (SM)</i> ; moist; fine to coarse sand; trace fine gravel; some organics; some iron oxide staining. (Fill)						5
		Light gray-brown, <i>Silty Sand with Gravel (SM)</i> ; moist; fine, subrounded gravel; fine to coarse sand; nonplastic to low plasticity; trace iron oxide staining. (Fill)						
10	R-3	- Medium dense from 1.3 to 3 feet.						10
		- Dense from 3 to 7 feet.						
15		- Sand to silty sand lense from 6.6 to 7.3 feet.	11.9					15
		- Very dense from 7 to 11.9 feet.	12.0					
		- Driller reported refusal at 12 feet.						
20		Very dense, gray, <i>Silty Sand with Gravel (SM)</i> ; moist; fine gravel; fine to coarse sand; diamict; (Competent Vashon Till [Qvt]?).						20
		- Driller reported refusal at 9.5 feet. Driller put a new shoe on the probe and recommenced drilling.						
		BOTTOM OF GEOPROBE COMPLETED 10/24/2022						

NOTES

1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.
2. Groundwater level, if indicated above, was estimated during probing and should be considered approximate.
3. Refer to KEY for definitions and explanation of symbols.
4. CT = corrosion test sample; TR = thermal resistivity sample; EN = environmental sample; GE = geotechnical sample; AR = archeological sample.

LEGEND

-  2" Plastic Tube - No Soil Recovery
 2" Plastic Tube with Soil Recovery
 Run No.

Former Fire Training Pit
Snohomish County Airport
Everett, Washington

LOG OF GEOPROBE FP-P11

May 2023

102986

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. D-17

Attachment D-1

IDW Disposal Documentation

CONTENTS

- Non-Hazardous Waste Manifest, September 20, 2022
- Certificate of Disposal, October 14, 2022
- Non-Hazardous Waste Manifest, March 9, 2023

491310

NON-HAZARDOUS WASTE MANIFEST		1. Generator ID Number EXEMPT	2. Page 1 of 1	3. Emergency Response Phone 1-800-424-8300	4. Waste Tracking Number PF82022-ESP1	
5. Generator's Name and Mailing Address PAINE FIELD/SNOHOMISH COUNTY AIRPORT 3220 100TH ST SW EVERETT WA 98204 Generator's Phone: (425) 508-7472						
6. Transporter 1 Company Name CHEMICAL WASTE MANAGEMENT, INC.					U.S. EPA ID Number ORD089452353	
7. Transporter 2 Company Name UPRR					U.S. EPA ID Number NED001782810	
8. Designated Facility Name and Site Address CHEMICAL WASTE MANAGEMENT, INC. 17629 CEDAR SPRINGS LANE ARLINGTON OR 97812-9709					U.S. EPA ID Number ORD089452353	
Facility's Phone: (503) 454-2643						
9. Waste Shipping Name and Description		10. Containers		11. Total Quantity	12. Unit Wt./Vol.	
		No.	Type			
1. MATERIAL NOT REGULATED BY D.O.T.		8	DM	5,000	P	
2. MATERIAL NOT REGULATED BY D.O.T.		3	DM	1,200	P	
3.						
4.						
13. Special Handling Instructions and Additional Information 1. OR351286 2. OR351290 WMXU 980594						
14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.						
Generator's/Officer's Printed/Typed Name Mitchell Harkfeld				Signature <i>m</i>	Month 9	Day 25
15. International Shipments ☐ Import to U.S. ☐ Export from U.S.				Port of entry/exit: Date leaving U.S.:	Year 22	
16. Transporter Acknowledgment of Receipt of Materials						
Transporter 1 Printed/Typed Name KEE LAURATI				Signature <i>KL</i>	Month 9	Day 20
Transporter 2 Printed/Typed Name G. Altheimer				Signature <i>GA</i>	Month 9	Day 23
17. Discrepancy						
17a. Discrepancy Indication Space ☐ Quantity ☒ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection Line 1, 3 drums contain free liquid. The liquid is water. OK to solidify per Shoshana Howard/Sr Eng. BMS 10.14.22						
17b. Alternate Facility (or Generator)					Manifest Reference Number: U.S. EPA ID Number	
Facility's Phone						
17c. Signature of Alternate Facility (or Generator)					Month Day Year	
18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in item 17a						
Printed/Typed Name Devin Dwyer				Signature <i>DD</i>	Month 10	Day 11
					Year 22	



CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

PAINE FIELD SNOHOMISH COUNTY
ATTN: MANIFEST SECTION
WAZ000011951
3220 100TH ST SW
EVERETT WA 98204

CERTIFICATE OF DISPOSAL

CWM OF THE NORTHWEST, EPA ID: ORD089452353, has received waste material from PAINE FIELD SNOHOMISH COUNTY on 10/11/22 as described on Shipping Document number PF92022-ESP1.

Profile Number: OR351286
CWM Tracking ID: 49131001
CWM Unit #: 1*0 thru 8*0
Disposal Date: 10/14/22

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.


A handwritten signature in blue ink, reading "Becky Sumner", is written over a horizontal line.

CWMNW RECORDS DEPARTMENT
Certificate # 266075
10/20/22



CWM OF THE NORTHWEST
Federal EPA ID: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

PAINE FIELD SNOHOMISH COUNTY
ATTN: MANIFEST SECTION
WAZ000011951
3220 100TH ST SW
EVERETT WA 98204

CERTIFICATE OF DISPOSAL

CWM OF THE NORTHWEST, EPA ID: ORD089452353, has received waste material from PAINE FIELD SNOHOMISH COUNTY on 10/11/22 as described on Shipping Document number PF92022-ESP1.

Profile Number: OR351290
CWM Tracking ID: 49131002
CWM Unit #: 1*0 thru 3*0
Disposal Date: 10/14/22

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

A handwritten signature in blue ink that reads 'Becky Sumner' is written over a horizontal line.

CWMNW RECORDS DEPARTMENT
Certificate # 266077
10/20/22

GENERATOR

INT'L

TRANSPORTER

DESIGNATED FACILITY

**NON-HAZARDOUS
WASTE MANIFEST**

1. Generator ID Number

WAZ000011051

2. Page 1 of

2

3. Emergency Response Phone

(800) 424-9300

4. Waste Tracking Number

PFSC3923-ESP1

5. Generator's Name and Mailing Address

PAINE FIELD SNOHOMISH COUNTY
3220 100TH ST SW
EVERETT WA 98204

Generator's Phone:

(425) 508-7472

Generator's Site Address (if different than mailing address)

U.S. EPA ID Number

ORD089452353

6. Transporter 1 Company Name

CHEMICAL WASTE MANAGEMENT, INC.

U.S. EPA ID Number

NED001792910

7. Transporter 2 Company Name

UPRR

U.S. EPA ID Number

ORD089452353

8. Designated Facility Name and Site Address

CHEMICAL WASTE MANAGEMENT, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709

Facility's Phone:

(541) 454-2643

9. Waste Shipping Name and Description

10. Containers

No.

Type

11. Total
Quantity12. Unit
Wt./Vol.

1. MATERIAL NOT REGULATED BY D.O.T.

OR351286

1

DM

450

P

2. MATERIAL NOT REGULATED BY D.O.T.

OR351290

1

DM

300

P

3.

4.

13. Special Handling Instructions and Additional Information

1. OR351286
2. OR351290

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offor's Printed/Typed Name

Signature

Month Day Year

3 9 23

15. International Shipments

☐ Import to U.S.☐ Export from U.S.

Port of entry/exit:

Transporter Signature (for exports only):

Date leaving U.S.:

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name

Pele Laupali

Signature

Month Day Year

3 9 23

Transporter 2 Printed/Typed Name

Signature

Month Day Year

17. Discrepancy

17a. Discrepancy Indication Space

☐ Quantity☐ Type☐ Residue☐ Partial Rejection☐ Full Rejection

Manifest Reference Number:

U.S. EPA ID Number

17b. Alternate Facility (or Generator)

Facility's Phone:

17c. Signature of Alternate Facility (or Generator)

Month Day Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name

Signature

Month Day Year

Attachment D-2

PFAS Reference Document RD-B74

ATTACHMENT D-2: PFAS REFERENCE DOCUMENT RD-B74



RD-B74

PFAS

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1.0 SCOPE AND APPLICABILITY

The procedures described herein define per- and polyfluoroalkyl substances (PFAS) specific sampling and handling techniques for various media, outline special considerations for communications about PFAS to clients and the general public, and provide additional guidance for projects involving PFAS. These techniques are necessary to prevent cross-contamination of water and soil samples collected for PFAS analysis and to navigate a rapidly changing and controversial regulatory environment.

This reference document (RD) is subject to change as new information becomes available. This RD is supplemental to current Shannon and Wilson, Inc. (SWI) RDs as befits the project. Additional RDs are listed in Section 8.0.

This RD defines a standard set of procedures applicable to a range of site conditions and projects. These procedures may be modified according to equipment limitations or project needs. Modifications to this RD will be described in a project-specific Work Plan or other document, and documented in the field notes, as applicable.

2.0 RESPONSIBILITY

The *Project Manager* (PM) is responsible for overseeing and ensuring that analytical samples are collected at required locations and with the appropriate frequency. The PM will ensure environmental samples are collected in accordance with this RD and any site-specific or project specific planning documents (e.g. approved Work Plan or Scope of Work).

It is the responsibility of the *Field Technician* (FT) to request the appropriate laboratory containers, coordinate with the analytical laboratory, and collect analytical water samples in accordance with this RD.

3.0 DEFINITIONS

PFAS are a group of man-made chemicals that include PFOA, PFOS, PFHxS, PFHpA, GenX, and many other compounds. These chemicals are considered an emerging contaminant.



4.0 REQUIRED MATERIALS / EQUIPMENT

The materials needed for this RD are project dependent. Materials may include but are not limited to the following:

- Field note paper and notebook
- Camera
- Residential Well Sampling Log (project specific)
- Well survey (project specific)
- Field Activities Daily Log
- Conversation record documents
- Business cards
- Chain of custody records (COCs)
- Sample cooler
- Gel ice packs
- YSI
- Nitrile gloves
- Sample labels
- Residential sampling bucket (green-different color than other purge buckets to avoid bringing residue from contaminated purge water into homes/businesses or sampling equipment stored in bucket)
- Purge cup
- Ziploc baggies
- Paper towels
- Filter wrench(es)
- Plastic cups
- Extra buckets
- Garden hose- flexible hose is best for travel but needs to be clipped or it will spray uncontrollably
- Trash bags
- Toolbox (optional)- at a minimum, bring a wrench for removing stubborn hoses
- Project specific sample jars or bottles
- Cell phone
- Public information packets, if applicable
- Clipboard
- Spare batteries - headlamp and YSI
- Headlamp - for crawlspaces, basements, utility rooms

The following for is needed for water supply well samples collected outside of the structures plumbing, or for soils:

- Soil sample jars
- Plastic spoons (or other soil collection tool)
- PFAS-free water for field or equipment blanks
- Peri-pump or whale pump and controller box
- Pump tubing
- Battery for pumps
- Water sounder
- Measuring tap
- Decontamination set-up

*see specific project details for water sample preservation requirements. Requirements may vary by state regulations and analyses requested.



4.1 Special considerations for materials when sampling for the presences of PFAS

Investigations of the presence of PFAS in consumer products are ongoing. Future testing may change the general cautions outlined in this section. This list is not comprehensive. See *Special Considerations for PFAS Sampling* document.

The following list has been updated. We note, caution during sampling to avoid these materials is needed, but it may be approved to have these items while sampling. However, none of these items should have contact with the sample.

- 4.1.1 Sunblock and insect repellent ingredients should be verified PFAS-free prior to use during sampling.
- 4.1.2 Clothing and personal protective equipment (PPE) treated for water, fire, or stain resistance, or UV protection should not be worn during sampling. Clothing should not be new or recently washed with fabric softeners.
- 4.1.3 Food and food packaging should be avoided during sampling or near sampling areas.
- 4.1.4 Do not use waterproof paper or notebooks.
- 4.1.5 Use aluminum clipboards and ball point pens that are known to be PFAS free. Some felt-tip pens are known to have PFAS. Confirm Sharpie or other felt tip, erasable, or waterproof pens are PFAS free prior to use.
- 4.1.6 Glues may contain PFAS, sticky type note pads (Post-it), adhesive labels, and tape should be verified PFAS free prior to use.
- 4.1.7 Chemical ice packs should be verified PFAS free and placed in liner bags for use in sample coolers. Sample jars and/or bottles should not be allowed to touch the ice packs.
- 4.1.8 Disposable, powderless, nitrile gloves should be worn during sampling and handling activities. Gloves should be changed frequently especially when potential contamination has occurred (i.e. touching clothing, skin, hair, or consumer products in the sampling area).
- 4.1.9 If sampling during rain, snow, or cold, confirm that weather-protection gear is PFAS free or take extra care to avoid touching clothing and shoes.
- 4.1.10 Pumps and pump tubing should be verified PFAS free.



5.0 PROCEDURES

5.1 General Sampling Procedures

- 5.1.1 All sample containers should be provided by the laboratory and made of polypropylene (PP) or high-density polyethylene (HDPE). PFAS are known to attach to the sample containers made of glass and other materials.
- 5.1.2 Any required sample preservatives should be laboratory provided and stored in PFAS-free containers.
- 5.1.3 If reusable equipment is used for sampling, proper decontamination is necessary before and after each sample. See *RD-B13- Equipment Decontamination*.
 - 5.1.3.1 Decontamination reagents must be PFAS free.
 - 5.1.3.2 Water used for final decontaminations rinse should be certified PFAS free by the laboratory, or a source water sample should be submitted for analysis.
 - 5.1.3.3 Verify decontamination reagents are effective at removing PFAS. See project manager to confirm effective decontamination agent.
- 5.1.4 Equipment blanks should be used at the frequency described in the work plan or scope of work. Water used to collect equipment and field blanks should be certified PFAS-free water, provided by a laboratory.
- 5.1.5 Care should be taken to avoid cross contamination in PFAS samples, where samples for other analytes are also being collected. Gloves should be changed prior to collecting PFAS samples and PFAS samples should be bagged separately to avoid touching other sample jars and/or bottles.
- 5.1.6 Only handle sample containers while wearing gloves. Samples labels should be filled out prior to donning gloves for sample collection.
- 5.1.7 Avoid touching clothing, skin, hair, and/or consumer products while wearing gloves. Gloves should be changed frequently. A fresh pair should be donned immediately prior to collecting PFAS samples.
- 5.1.8 Sample containers should be stored in closed boxes or coolers when not in use. Storage boxes should be labeled as containing PFAS sampling equipment. Storing sample containers in plastic baggies is recommended to prevent inadvertent exposure to potential contaminants. If leaving a storage container for long periods of time, a custody seal should be added.



- 5.1.9 Laboratory provided sample containers do not need to be and should not be rinsed prior to collection.
- 5.1.10 Some softeners have bypass valves. DO NOT force a bypass valve. Have the homeowner do this, if possible. When they break, they can unleash the contents of the pressure tank (and will continue to pump water until pump/power is off).

5.2 Groundwater Sampling Procedures

See *RD-B41 Analytical Water Sample Collection*, *RD-B42- Monitoring Well Sampling*, or *RD-B44- Potable Water (Private) Well Sampling* for general groundwater sample collection techniques. Confirm purging requirements (e.g. three well volumes versus parameter stabilization) prior to collecting samples.

- 5.2.1 If a monitoring well has permanent fixtures that may contain PFAS, the sample results may need to be flagged or rejected in the analytical database at the discretion of the project manager.
 - 5.2.1.1 If dedicated tubing or fixtures that may contain PFAS can be removed from a monitoring well, extra precautions should be taken. This may include removal of equipment fourteen days prior to sample, or doubling purge requirements. Please confirm procedures with a project manager prior to sampling.
- 5.2.2 Do not filter samples prior to PFAS analysis.
- 5.2.3 Do not collect a sample through a hose or reusable tubing. Note on the sampling sheet if a sample was collected through a hose. Results may need to be flagged in the analytical database at the discretion of the project manager.
- 5.2.4 When collecting samples from private or public water-supply wells, note any fixtures or hardware that may contain PFAS that cannot be removed or bypassed for sample collection (Teflon plumbing tape, piping of unknown material, etc.). In residential/public spaces, it can be difficult or impossible to remove products that may contain PFAS from the sampling area. Take extra precautions to avoid touching products in the area and note any potential contamination sources in the sampling area. Where possible, locate a different sampling location.
- 5.2.5 If transfer containers are necessary, use PFAS-free plastic cups. Thoroughly rinse the transfer container with the water source being sampled prior to filling the sample bottles.
- 5.2.6 For private well samples, collect samples upstream of water treatment such as water softeners, chlorine systems, and filtration units. For some projects, we do not consider small (i.e., less than 18 inches in height) particulate filters to be



treatment. Discuss with your project manager prior to sample collection. Charcoal filters can remove PFAS, ask or check what type of filters are used prior to taking sample after filters. Note: Clear the pipes at the sample point after purging is complete, if the sample location is different than the purge location.

- 5.2.6.1 If a pre-treatment location cannot be accessed, samples results may need to be flagged in the analytical database at the discretion of the project manager.

5.3 Surface Water Sampling Procedures

See *RD-B45-Surface-Water Sampling* for general surface water sample collection techniques.

- 5.3.1 If transfer bottles are necessary to collect surface water, they must be PFAS-free and made of the same material as laboratory provided containers. Transfer bottles should be rinsed using the water to be sampled prior to filling the sample containers.
- 5.3.2 Avoid standing in the water you are sampling. If necessary, stand downstream of your sample collection point (in flowing water), and wait for disturbed sediment to settle prior to collecting the sample.
- 5.3.3 If collecting from a boat, wearing waders or waterproof footwear, using water column samplers or other equipment that may contain PFAS, sample results may need to be flagged in the analytical database at the discretion of the project manager. You should note on the sample log when these items are used.

5.4 Soil Sampling Procedures

Techniques may vary. See *RD-B31- Analytical Soil Sample Collection* for general soil sample collection techniques.

- 5.4.1 Surface soil samples should be collected using decontaminated stainless steels spoons, shovels, laboratory-provided sampling tools, or disposable PFAS free plastic spoons.
- 5.4.2 Equipment used for subsurface sampling or soil borings should be PFAS free.
- 5.4.3 Samples should be collected near the surface immediately below vegetation, where present.



6.0 HEALTH AND SAFETY

A Site Safety & Health Plan (SSHP) and/or Job Safety Analysis worksheet (JSA) will be prepared for each project and will discuss safety issues involved. Any staff working on the project must read and abide by the SSHP and sign the SSHP acknowledgement form.

Personnel using this procedure will utilize PPE in accordance with these plans.

The SSHP will provide Safety Data Sheets (SDSs) for any chemicals that will be used on the project or that are known possible exposure risks for the site. Personnel using this procedure must be trained on the information contained in the SDSs, any engineering controls, and any required PPE.

7.0 QUALITY ASSURANCE / QUALITY CONTROL

QC activities are designed to allow self-verification of the quality and consistency of the work.

7.1 Interferences and Potential Problems

- 7.1.1 Inability to locate or access pre-treatment sampling location.
- 7.1.2 Presence of PFAS or PFAS-containing products in sampling area, monitoring well structure, drilling equipment, plumbing, pumps, or other equipment. In these cases, a field blank may need to be collected along with the project sample.
- 7.1.3 Inability to achieve stable parameters in residential well sampling situations.

7.2 Applicable Quality Assurance Manual procedures:

- 7.2.1 QP 05 Preparation of Field Activity Reports
- 7.2.2 QP 13 Document Control and Retention

8.0 OTHER REFERENCES

- *RD-A11- Field notes and Documentation*
- *RD-A12- Field Instrument Calibration*
- *RD-B11- Environmental Sample Handling*
- *RD-B13- Equipment Decontamination*
- *RD-B15- Environmental Database Operations*



- *RD-B25- Equipment Use - YSI-SW*
- *RD-B31- Analytical Soil Sample Collection*
- *RD-B34-Contaminated Soil Stockpiling and Sampling*
- *RD-B41-Analytical Water Sample Collection*
- *RD-B42- Monitoring-Well Sampling*
- *RD-B43-Well-Point Sampling*
- *RD-B44- Potable Water (Private) Well Sampling*
- *RD-B45-Surface-Water Sampling*
- *RD-B46- Pore-Water Sampling*
- *RD-B51-Monitoring Well Installation*
- *RD-B52- Monitoring Well Maintenance*
- *RD-B54- Water Supply Well Decommissioning*
- *RD-B72- Sediment Sampling*
- *Special Considerations for PFAS Sampling*
- Denly E, Occhialini J, Bassignani P, Eberle M, Rabah N. Per- and polyfluoroalkyl substances in environmental sampling products: Fact or fiction? *Remediation*. 2019;29:65–76.
<https://doi.org/10.1002/rem.21614>

9.0 DOCUMENTATION

9.1 Review

The Project Manager will review the field-work records pertaining to the activities under their supervision. The elements of this review will include technical content, consistency, and compliance with the project plans, and RDs.

9.2 Archive

At the completion of the project, all original field logbooks and records will be stored in the project files in accordance with project procedures. Project file lifetime is established according to standard Shannon & Wilson file-retention procedures, or sometimes controlled and spelled out in contractual agreements with clients.

Correspondence (including email, telephone, and in-person conversations) with the clients, sub-contractors, and the public will be documented and stored in accordance with project procedures.



10.0 TRAINING AND PREREQUISITES

In order to perform sampling activities without supervision, the Field Technician must accomplish the following:

- Read this RD.
- Familiarize themselves with the applicable QAM procedures (listed in Section 7.2) as well as the references applicable to the project (Section 8.0).
- Complete supervised, on-the-job instruction with experienced field technicians or project managers. Number of hours and days will differ for each individual, determined by a project manager or experienced field technicians.
- Residential sampling program training prior to sampling alone.

Environmental sampling will be performed by a State of Alaska Qualified Sampler (18 AAC 75.333[c] and 18 AAC 78.088[c]) and/or Qualified Environmental Professional (18 AAC 75.333[b], 18 AAC 78.088[b]), or a supervised individual in training to become a Qualified Sampler. Per ADEC, a Qualified Sampler will, at a minimum, hold a “completed degree in environmental science or another related scientific field... [and have] at least three months of experience in environmental sampling under the direct supervision of a qualified environmental professional.”

Before performing this procedure, field staff will also be trained in analytical sample collection by an experienced staff member. Training will entail at least one day of supervised, on-the-job instruction.

11.0 ATTACHMENTS

A selection of relevant forms as of the publication date of this RD and are included here for reference only. Always obtain necessary forms from the project folder or project manager.

- Chain-of-Custody Form
- Well sampling log
- Field Activity Daily Log
- Monitoring well log
- Soil sample collection log



12.0 DOCUMENT HISTORY AND VERSION CONTROL

Version: 1.0 Date: 03/25/2020 Approved by:KRF

Version	Date	Reason/Description of Change(s)	Author	Reviews
1.0	5/25/2020	New.	ARM	KRF
1.1	9/10/2022	Updated to address current standards	ARM	KRF

Appendix E

Analytical Reports

CONTENTS

- Analytical Report, Eurofins Sacramento, lab job ID 320-88345-1, dated July 1, 2022
- Analytical Report, Eurofins Sacramento, lab job ID 320-88632-1, dated July 11, 2022
- Analytical Report, Eurofins Sacramento, lab job ID 320-94720-1, dated December 21, 2022
- Analytical Report, Eurofins Sacramento, lab job ID 320-95325-1, dated January 17, 2023

ANALYTICAL REPORT

Eurofins Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
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Laboratory Job ID: 320-88345-1
Client Project/Site: Paine Field

For:
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Authorized for release by:
7/1/2022 2:35:42 PM

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Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

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Qualifiers

LCMS

Qualifier	Qualifier Description
*5+	Isotope dilution analyte is outside acceptance limits, high biased.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
B	Compound was found in the blank and sample.
E	Result exceeded calibration range.
F1	MS and/or MSD recovery exceeds control limits.
I	Value is EMPC (estimated maximum possible concentration).
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

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Laboratory: Eurofins Sacramento

Narrative

Job Narrative 320-88345-1

Receipt

The samples were received on 5/26/2022 9:35 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 1.6° C and 2.2° C.

Receipt Exceptions

The container label for the following sample(s) did not match the information listed on the Chain-of-Custody (COC): Sample 35, container has ID FP-101:1.5. Missing P before 101. COC lists ID: FP-P101:1.5. Sample logged in and labeled according to COC. FP-P101:1.5 (320-88345-35).

LCMS

Method 537 (modified): The method blank for preparation batch 320-592017 and analytical batch 320-592371 contained Perfluorooctanesulfonic acid (PFOS) above the reporting limit (RL). Associated samples were not re-extracted and/or re-analyzed because results were greater than 10X the value found in the method blank: FP-P7:0.5 (320-88345-28), FP-P7:7.0 (320-88345-29), FP-P100:0.5 (320-88345-31), FP-P8:1.5 (320-88345-32), FP-P101:1.5 (320-88345-35), FP-MW1:7.6 (320-88345-37), (MB 320-592017/1-A), (320-88345-A-28-B MS) and (320-88345-A-28-C MSD)

Method 537 (modified): The transition mass ratio was outside the established ratio limit for Perfluoroundecanoic acid (PFUnA) associated to this data set. This is indicated by the "R" flag in the raw data. As the flagged data is in control in the CCVL, there is no adverse impact to the data. (CCVL 320-591400/2)

Method 537 (modified): The "I" qualifier means the transition mass ratio for the indicated analyte was below the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty. However, analyst judgment was used to positively identify the analyte. FP-P1:10.2 (320-88345-6) and FP-P3:1.2 (320-88345-12)

Method 537 (modified): The "I" qualifier means the transition mass ratio for the indicated analyte was above the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty, and the reported value may have some high bias. However, analyst judgment was used to positively identify the analyte. FP-P7:0.5 (320-88345-28) and FP-P100:0.5 (320-88345-31)

Method 537 (modified): Results for sample FP-P9:0.5 (320-88345-1) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits

Method 537 (modified): Results for sample(s) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits. FP-P9:6.5 (320-88345-2)

Method 537 (modified): Results for samples FP-P2:5.3 (320-88345-9) and FP-P6:0.5 (320-88345-25) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits

Method 537 (modified): Results for samples FP-P2:GW (320-88345-11), FP-P3:GW (320-88345-16) and FP-P4:GW (320-88345-20) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract as well as sample matrix. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits

Method 537 (modified): Results for samples FP-P7:0.5 (320-88345-28), FP-P7:7.0 (320-88345-29), FP-P100:0.5 (320-88345-31), FP-P101:1.5 (320-88345-35), FP-MW1:7.6 (320-88345-37), (320-88345-A-28-B MS) and (320-88345-A-28-C MSD) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits.

Case Narrative

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Job ID: 320-88345-1 (Continued)

Laboratory: Eurofins Sacramento (Continued)

Method 537 (modified): Results for sample FP-P101:1.5 (320-88345-35) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits

Method 537 (modified): The concentration of one or more analytes associated with the following samples exceeded the instrument calibration range for Perfluorooctanesulfonic acid (PFOS) . This analyte has been qualified; however, the peak(s) did not saturate the instrument detector. Historical data indicate that for the isotope dilution method, dilution and re-analysis will not produce significantly different results from those reported above the calibration range. FP-MW1:0.4 (320-88345-36) and FP-MW100:0.4 (320-88345-39)

Method 537 (modified): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for the following sample: FP-P3:GW (320-88345-16). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method 537 (modified): The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 320-592017 and analytical batch 320-592371 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method 537 (modified): The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 320-592017 and analytical batch 320-592730 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

Method 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-592403.

Method 3535: During the solid phase extraction process, the following samples contained non-settable particulates which clogged the solid phase extraction column: FP-P9:GW (320-88345-4), FP-P2:GW (320-88345-11), FP-P3:GW (320-88345-16) and FP-P4:GW (320-88345-20).
preparation batch 320-592403

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P9:0.5

Lab Sample ID: 320-88345-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.24		0.21	0.033	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.11	J	0.21	0.057	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.12	J	0.21	0.023	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.060	J	0.21	0.041	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.9		0.21	0.031	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	74		2.1	0.46	ug/Kg	10	✱	537 (modified)	Total/NA

Client Sample ID: FP-P9:6.5

Lab Sample ID: 320-88345-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.59		0.24	0.037	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.052	J	0.24	0.046	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.40		0.24	0.064	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.12	J	0.24	0.027	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.20	J	0.24	0.046	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.7		0.24	0.035	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	82		2.4	0.52	ug/Kg	10	✱	537 (modified)	Total/NA

Client Sample ID: FP-P9:GW

Lab Sample ID: 320-88345-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	11		1.8	0.52	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.3	J	1.8	0.22	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	6.8		1.8	0.76	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.92	J	1.8	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	7.3		1.8	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	120		1.8	0.51	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	290		1.8	0.48	ng/L	1		537 (modified)	Total/NA

Client Sample ID: FP-P1:0.2

Lab Sample ID: 320-88345-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.057	J	0.22	0.034	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.041	J	0.22	0.041	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.16	J	0.22	0.024	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.032	J	0.22	0.031	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.35		0.22	0.047	ug/Kg	1	✱	537 (modified)	Total/NA

Client Sample ID: FP-P1:10.2

Lab Sample ID: 320-88345-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.051	J	0.24	0.035	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.26	I	0.24	0.052	ug/Kg	1	✱	537 (modified)	Total/NA

Client Sample ID: FP-P2:0.2

Lab Sample ID: 320-88345-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.075	J	0.20	0.031	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.14	J	0.20	0.029	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.53		0.20	0.043	ug/Kg	1	✱	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Sacramento

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P2:5.3

Lab Sample ID: 320-88345-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	1.1		0.22	0.034	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.40		0.22	0.041	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.2		0.22	0.057	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.24		0.22	0.041	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.6		0.22	0.046	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	24		1.1	0.16	ug/Kg	5	✱	537 (modified)	Total/NA
- DL									

Client Sample ID: FP-P2:GW

Lab Sample ID: 320-88345-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	99		1.8	0.52	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	23		1.8	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	3.8		1.8	0.77	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	55		1.8	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	19		1.8	0.49	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	530		9.0	2.6	ng/L	5		537 (modified)	Total/NA
- DL									

Client Sample ID: FP-P3:1.2

Lab Sample ID: 320-88345-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	6.0		0.27	0.041	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.8		0.27	0.051	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.082	J	0.27	0.071	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.083	J	0.27	0.029	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.11	J I	0.27	0.039	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	7.3		0.27	0.057	ug/Kg	1	✱	537 (modified)	Total/NA

Client Sample ID: FP-P3:6.3

Lab Sample ID: 320-88345-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	3.0		0.23	0.036	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.63		0.23	0.044	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.14	J	0.23	0.033	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.11	J	0.23	0.049	ug/Kg	1	✱	537 (modified)	Total/NA

Client Sample ID: FP-SH1:0.5

Lab Sample ID: 320-88345-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	5.9		0.22	0.035	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.97		0.22	0.042	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.70		0.22	0.059	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	1.2		0.22	0.025	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	1.9		0.22	0.054	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.74		0.22	0.047	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorododecanoic acid (PFDoA)	0.32		0.22	0.033	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorotridecanoic acid (PFTriA)	0.097	J	0.22	0.023	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.087	J	0.22	0.041	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.20	J	0.22	0.032	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	5.1		0.22	0.048	ug/Kg	1	✱	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Sacramento

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P3:GW

Lab Sample ID: 320-88345-16

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	12		1.7	0.74	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	9.4		1.7	0.17	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	130		1.7	0.50	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.9		1.7	0.47	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	660		17	2.2	ng/L	10		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL2	3500		35	10	ng/L	20		537 (modified)	Total/NA

Client Sample ID: FP-P4:1.4

Lab Sample ID: 320-88345-17

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.58		0.20	0.030	ug/Kg	1	✳	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.62		0.20	0.037	ug/Kg	1	✳	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.48		0.20	0.052	ug/Kg	1	✳	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.47		0.20	0.022	ug/Kg	1	✳	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.24		0.20	0.028	ug/Kg	1	✳	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	3.0		0.20	0.042	ug/Kg	1	✳	537 (modified)	Total/NA

Client Sample ID: FP-P4:11.6

Lab Sample ID: 320-88345-18

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	3.0		0.25	0.038	ug/Kg	1	✳	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.3		0.25	0.047	ug/Kg	1	✳	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.53		0.25	0.065	ug/Kg	1	✳	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.028	J	0.25	0.027	ug/Kg	1	✳	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.27		0.25	0.036	ug/Kg	1	✳	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.12	J	0.25	0.053	ug/Kg	1	✳	537 (modified)	Total/NA

Client Sample ID: FP-P4:GW

Lab Sample ID: 320-88345-20

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	320		1.8	0.22	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	180		1.8	0.76	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	7.1		1.8	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	79		1.8	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	89		1.8	0.48	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	1000		9.0	2.6	ng/L	5		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	440		9.0	2.6	ng/L	5		537 (modified)	Total/NA

Client Sample ID: FP-SH2:0.5

Lab Sample ID: 320-88345-21

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	2.0		0.21	0.032	ug/Kg	1	✳	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.84		0.21	0.039	ug/Kg	1	✳	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.50		0.21	0.055	ug/Kg	1	✳	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	1.8		0.21	0.023	ug/Kg	1	✳	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	3.5		0.21	0.050	ug/Kg	1	✳	537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	1.4		0.21	0.044	ug/Kg	1	✳	537 (modified)	Total/NA
Perfluorododecanoic acid (PFDoA)	0.26		0.21	0.031	ug/Kg	1	✳	537 (modified)	Total/NA
Perfluorotridecanoic acid (PFTriA)	0.085	J	0.21	0.022	ug/Kg	1	✳	537 (modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.068	J	0.21	0.038	ug/Kg	1	✳	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.26		0.21	0.030	ug/Kg	1	✳	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	4.7		0.21	0.045	ug/Kg	1	✳	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Sacramento

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P5:0.5

Lab Sample ID: 320-88345-22

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.049	J	0.20	0.032	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.045	J	0.20	0.039	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.17	J	0.20	0.054	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.31		0.20	0.022	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.076	J	0.20	0.049	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.14	J	0.20	0.043	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorotridecanoic acid (PFTriA)	0.071	J	0.20	0.021	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.36		0.20	0.029	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	5.3		0.20	0.044	ug/Kg	1	✱	537 (modified)	Total/NA

Client Sample ID: FP-P5:7.5

Lab Sample ID: 320-88345-23

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.29		0.23	0.036	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.22	J	0.23	0.044	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.2		0.23	0.061	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.14	J	0.23	0.044	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.4		0.23	0.033	ug/Kg	1	✱	537 (modified)	Total/NA

Client Sample ID: FP-P6:0.5

Lab Sample ID: 320-88345-25

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.058	J	0.22	0.033	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.055	J	0.22	0.041	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.35		0.22	0.024	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.11	J	0.22	0.052	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	1.4		0.22	0.045	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorododecanoic acid (PFDoA)	0.035	J	0.22	0.032	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorotridecanoic acid (PFTriA)	0.51		0.22	0.023	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.27		0.22	0.031	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	28		1.1	0.23	ug/Kg	5	✱	537 (modified)	Total/NA

Client Sample ID: FP-P6:3.4

Lab Sample ID: 320-88345-26

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.10	J	0.25	0.038	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.087	J	0.25	0.047	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.17	J	0.25	0.065	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.032	J	0.25	0.027	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.58		0.25	0.036	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.89		0.25	0.053	ug/Kg	1	✱	537 (modified)	Total/NA

Client Sample ID: FP-P7:0.5

Lab Sample ID: 320-88345-28

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.63	F1	0.20	0.032	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.14	J	0.20	0.039	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.5	F1	0.20	0.054	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	6.7	F1	0.20	0.022	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.83		0.20	0.049	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorododecanoic acid (PFDoA)	0.48		0.20	0.031	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorotridecanoic acid (PFTriA)	11		0.20	0.021	ug/Kg	1	✱	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Sacramento

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P7:0.5 (Continued)

Lab Sample ID: 320-88345-28

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorotetradecanoic acid (PFTeA)	0.32		0.20	0.038	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.26		0.20	0.039	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	10		0.20	0.030	ug/Kg	1	✱	537 (modified)	Total/NA
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.13	J I	0.20	0.023	ug/Kg	1	✱	537 (modified)	Total/NA
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.32		0.20	0.049	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA) - DL	29		10	2.1	ug/Kg	50	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	820	B	10	2.2	ug/Kg	50	✱	537 (modified)	Total/NA

Client Sample ID: FP-P7:7.0

Lab Sample ID: 320-88345-29

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.63		0.22	0.034	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.11	J	0.22	0.041	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.82		0.22	0.058	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	3.8		0.22	0.024	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.18	J	0.22	0.041	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	7.1		0.22	0.031	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	270	B	4.3	0.93	ug/Kg	20	✱	537 (modified)	Total/NA

Client Sample ID: FP-P100:0.5

Lab Sample ID: 320-88345-31

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.49		0.20	0.031	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.11	J	0.20	0.038	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.4		0.20	0.053	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	6.5		0.20	0.022	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.73		0.20	0.048	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorododecanoic acid (PFDoA)	0.42		0.20	0.030	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorotridecanoic acid (PFTriA)	7.7		0.20	0.021	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.19	J	0.20	0.037	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.20		0.20	0.038	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	9.0		0.20	0.029	ug/Kg	1	✱	537 (modified)	Total/NA
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.093	J I	0.20	0.023	ug/Kg	1	✱	537 (modified)	Total/NA
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.33		0.20	0.048	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA) - DL	23		10	2.1	ug/Kg	50	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	720	B	10	2.2	ug/Kg	50	✱	537 (modified)	Total/NA

Client Sample ID: FP-P8:1.5

Lab Sample ID: 320-88345-32

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.14	J	0.21	0.033	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.075	J	0.21	0.041	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.13	J	0.21	0.057	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.78		0.21	0.024	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.13	J	0.21	0.045	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorotridecanoic acid (PFTriA)	0.14	J	0.21	0.022	ug/Kg	1	✱	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Sacramento

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P8:1.5 (Continued)

Lab Sample ID: 320-88345-32

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.18	J	0.21	0.031	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	14	B	0.21	0.046	ug/Kg	1	✱	537 (modified)	Total/NA

Client Sample ID: FP-P8:6.3

Lab Sample ID: 320-88345-33

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.17	J	0.22	0.034	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.090	J	0.22	0.042	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.31		0.22	0.058	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.049	J	0.22	0.024	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.22		0.22	0.032	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.2		0.22	0.047	ug/Kg	1	✱	537 (modified)	Total/NA

Client Sample ID: FP-P101:1.5

Lab Sample ID: 320-88345-35

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.21		0.21	0.032	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.093	J	0.21	0.039	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.19	J	0.21	0.055	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	1.6		0.21	0.023	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.13	J	0.21	0.044	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorotridecanoic acid (PFTriA)	0.14	J	0.21	0.022	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.39		0.21	0.030	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	25	B	1.0	0.22	ug/Kg	5	✱	537 (modified)	Total/NA

Client Sample ID: FP-MW1:0.4

Lab Sample ID: 320-88345-36

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.24		0.21	0.032	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.053	J	0.21	0.039	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.22		0.21	0.055	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.47		0.21	0.023	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.29		0.21	0.049	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	14		0.21	0.043	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorododecanoic acid (PFDoA)	0.41		0.21	0.031	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorotridecanoic acid (PFTriA)	11		0.21	0.022	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.19	J	0.21	0.038	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.7		0.21	0.030	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	75	E	0.21	0.044	ug/Kg	1	✱	537 (modified)	Total/NA
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.039	J	0.21	0.024	ug/Kg	1	✱	537 (modified)	Total/NA
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.087	J	0.21	0.049	ug/Kg	1	✱	537 (modified)	Total/NA

Client Sample ID: FP-MW1:7.6

Lab Sample ID: 320-88345-37

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.34		0.22	0.034	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.050	J	0.22	0.042	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.26		0.22	0.058	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	4.9		0.22	0.024	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.055	J	0.22	0.052	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.14	J	0.22	0.042	ug/Kg	1	✱	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Sacramento

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-MW1:7.6 (Continued)

Lab Sample ID: 320-88345-37

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	7.5		0.22	0.032	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	200	B	4.4	0.94	ug/Kg	20	✱	537 (modified)	Total/NA

Client Sample ID: FP-MW100:0.4

Lab Sample ID: 320-88345-39

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.25		0.21	0.032	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.054	J	0.21	0.039	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.25		0.21	0.054	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.48		0.21	0.023	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.40		0.21	0.049	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	11		0.21	0.043	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorododecanoic acid (PFDoA)	0.27		0.21	0.031	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorotridecanoic acid (PFTriA)	5.6		0.21	0.022	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.067	J	0.21	0.038	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.6		0.21	0.030	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	94	E	0.21	0.044	ug/Kg	1	✱	537 (modified)	Total/NA
N-ethylperfluorooctanesulfonamidoacetic acid (NETFOSAA)	0.058	J	0.21	0.049	ug/Kg	1	✱	537 (modified)	Total/NA

Client Sample ID: FP-MW2:0.5

Lab Sample ID: 320-88345-40

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.053	J	0.21	0.032	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.060	J	0.21	0.055	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.040	J	0.21	0.030	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.39		0.21	0.044	ug/Kg	1	✱	537 (modified)	Total/NA

Client Sample ID: FP-MW2:7.0

Lab Sample ID: 320-88345-41

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.16	J	0.22	0.033	ug/Kg	1	✱	537 (modified)	Total/NA

Client Sample ID: FP-MW101:0.5

Lab Sample ID: 320-88345-43

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.034	J	0.22	0.034	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.040	J	0.22	0.032	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.25		0.22	0.047	ug/Kg	1	✱	537 (modified)	Total/NA

Client Sample ID: FP-HA1:0.8

Lab Sample ID: 320-88345-44

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	1.5		0.21	0.033	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.81		0.21	0.040	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.15	J	0.21	0.056	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	1.1		0.21	0.023	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.40		0.21	0.051	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.26		0.21	0.045	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorododecanoic acid (PFDoA)	0.037	J	0.21	0.032	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorotridecanoic acid (PFTriA)	0.066	J	0.21	0.022	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.060	J	0.21	0.031	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.2		0.21	0.046	ug/Kg	1	✱	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Sacramento

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-HA1:4.0

Lab Sample ID: 320-88345-45

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	3.1		0.22	0.034	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.3		0.22	0.042	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.084	J	0.22	0.058	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.13	J	0.22	0.024	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.12	J	0.22	0.032	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.38		0.22	0.047	ug/Kg	1	✱	537 (modified)	Total/NA

Client Sample ID: FP-MW3:0.5

Lab Sample ID: 320-88345-46

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.12	J	0.21	0.032	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.067	J	0.21	0.039	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.16	J	0.21	0.055	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.16	J	0.21	0.023	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.14	J	0.21	0.043	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorotridecanoic acid (PFTriA)	0.060	J	0.21	0.022	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	3.6		0.21	0.030	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	18		0.21	0.044	ug/Kg	1	✱	537 (modified)	Total/NA

Client Sample ID: FP-MW3:2.7

Lab Sample ID: 320-88345-47

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.30		0.20	0.032	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.18	J	0.20	0.039	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.12	J	0.20	0.054	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.085	J	0.20	0.022	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.0		0.20	0.029	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	3.1		0.20	0.044	ug/Kg	1	✱	537 (modified)	Total/NA

Client Sample ID: FP-MW102:0.5

Lab Sample ID: 320-88345-49

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.072	J	0.22	0.034	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.049	J	0.22	0.041	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.11	J	0.22	0.058	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.090	J	0.22	0.024	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.5		0.22	0.032	ug/Kg	1	✱	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	5.0		0.22	0.047	ug/Kg	1	✱	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Sacramento

Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P9:0.5

Lab Sample ID: 320-88345-1

Date Collected: 05/23/22 09:35

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 90.5

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.24		0.21	0.033	ug/Kg	☆	05/30/22 12:03	06/02/22 17:30	1
Perfluoroheptanoic acid (PFHpA)	ND		0.21	0.041	ug/Kg	☆	05/30/22 12:03	06/02/22 17:30	1
Perfluorooctanoic acid (PFOA)	0.11	J	0.21	0.057	ug/Kg	☆	05/30/22 12:03	06/02/22 17:30	1
Perfluorononanoic acid (PFNA)	0.12	J	0.21	0.023	ug/Kg	☆	05/30/22 12:03	06/02/22 17:30	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.051	ug/Kg	☆	05/30/22 12:03	06/02/22 17:30	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.045	ug/Kg	☆	05/30/22 12:03	06/02/22 17:30	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.032	ug/Kg	☆	05/30/22 12:03	06/02/22 17:30	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.022	ug/Kg	☆	05/30/22 12:03	06/02/22 17:30	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.039	ug/Kg	☆	05/30/22 12:03	06/02/22 17:30	1
Perfluorobutanesulfonic acid (PFBS)	0.060	J	0.21	0.041	ug/Kg	☆	05/30/22 12:03	06/02/22 17:30	1
Perfluorohexanesulfonic acid (PFHxS)	2.9		0.21	0.031	ug/Kg	☆	05/30/22 12:03	06/02/22 17:30	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.21	0.025	ug/Kg	☆	05/30/22 12:03	06/02/22 17:30	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.21	0.051	ug/Kg	☆	05/30/22 12:03	06/02/22 17:30	1
F-53B Major	ND		0.21	0.037	ug/Kg	☆	05/30/22 12:03	06/02/22 17:30	1
HFPO-DA (GenX)	ND		0.21	0.044	ug/Kg	☆	05/30/22 12:03	06/02/22 17:30	1
F-53B Minor	ND		0.21	0.033	ug/Kg	☆	05/30/22 12:03	06/02/22 17:30	1
DONA	ND		0.21	0.042	ug/Kg	☆	05/30/22 12:03	06/02/22 17:30	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	87		25 - 150	05/30/22 12:03	06/02/22 17:30	1
13C2 PFDA	85		25 - 150	05/30/22 12:03	06/02/22 17:30	1
13C4 PFOS	65		25 - 150	05/30/22 12:03	06/02/22 17:30	1
d3-NMeFOSAA	71		25 - 150	05/30/22 12:03	06/02/22 17:30	1
d5-NEtFOSAA	78		25 - 150	05/30/22 12:03	06/02/22 17:30	1
13C3 HFPO-DA	78		25 - 150	05/30/22 12:03	06/02/22 17:30	1
18O2 PFHxS	77		25 - 150	05/30/22 12:03	06/02/22 17:30	1
13C3 PFBS	69		25 - 150	05/30/22 12:03	06/02/22 17:30	1
13C2 PFDoA	79		25 - 150	05/30/22 12:03	06/02/22 17:30	1
13C2 PFTeDA	68		25 - 150	05/30/22 12:03	06/02/22 17:30	1
13C5 PFNA	78		25 - 150	05/30/22 12:03	06/02/22 17:30	1
13C4 PFOA	83		25 - 150	05/30/22 12:03	06/02/22 17:30	1
13C2 PFUnA	80		25 - 150	05/30/22 12:03	06/02/22 17:30	1
13C4 PFHpA	93		25 - 150	05/30/22 12:03	06/02/22 17:30	1

Method: 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	74		2.1	0.46	ug/Kg	☼	05/30/22 12:03	06/08/22 06:53	10
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOS	85		25 - 150				05/30/22 12:03	06/08/22 06:53	10

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	9.5		0.1	0.1	%	-		05/27/22 10:41	1
Percent Solids	90.5		0.1	0.1	%	-		05/27/22 10:41	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P9:6.5

Lab Sample ID: 320-88345-2

Date Collected: 05/23/22 09:40

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 82.0

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.59		0.24	0.037	ug/Kg	☆	05/30/22 12:03	06/02/22 17:40	1
Perfluoroheptanoic acid (PFHpA)	0.052	J	0.24	0.046	ug/Kg	☆	05/30/22 12:03	06/02/22 17:40	1
Perfluorooctanoic acid (PFOA)	0.40		0.24	0.064	ug/Kg	☆	05/30/22 12:03	06/02/22 17:40	1
Perfluorononanoic acid (PFNA)	0.12	J	0.24	0.027	ug/Kg	☆	05/30/22 12:03	06/02/22 17:40	1
Perfluorodecanoic acid (PFDA)	ND		0.24	0.058	ug/Kg	☆	05/30/22 12:03	06/02/22 17:40	1
Perfluoroundecanoic acid (PFUnA)	ND		0.24	0.051	ug/Kg	☆	05/30/22 12:03	06/02/22 17:40	1
Perfluorododecanoic acid (PFDoA)	ND		0.24	0.036	ug/Kg	☆	05/30/22 12:03	06/02/22 17:40	1
Perfluorotridecanoic acid (PFTriA)	ND		0.24	0.025	ug/Kg	☆	05/30/22 12:03	06/02/22 17:40	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.24	0.045	ug/Kg	☆	05/30/22 12:03	06/02/22 17:40	1
Perfluorobutanesulfonic acid (PFBS)	0.20	J	0.24	0.046	ug/Kg	☆	05/30/22 12:03	06/02/22 17:40	1
Perfluorohexanesulfonic acid (PFHxS)	6.7		0.24	0.035	ug/Kg	☆	05/30/22 12:03	06/02/22 17:40	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.24	0.028	ug/Kg	☆	05/30/22 12:03	06/02/22 17:40	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.24	0.058	ug/Kg	☆	05/30/22 12:03	06/02/22 17:40	1
F-53B Major	ND		0.24	0.042	ug/Kg	☆	05/30/22 12:03	06/02/22 17:40	1
HFPO-DA (GenX)	ND		0.24	0.049	ug/Kg	☆	05/30/22 12:03	06/02/22 17:40	1
F-53B Minor	ND		0.24	0.037	ug/Kg	☆	05/30/22 12:03	06/02/22 17:40	1
DONA	ND		0.24	0.047	ug/Kg	☆	05/30/22 12:03	06/02/22 17:40	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	86		25 - 150	05/30/22 12:03	06/02/22 17:40	1
13C2 PFDA	88		25 - 150	05/30/22 12:03	06/02/22 17:40	1
13C4 PFOS	72		25 - 150	05/30/22 12:03	06/02/22 17:40	1
d3-NMeFOSAA	74		25 - 150	05/30/22 12:03	06/02/22 17:40	1
d5-NEtFOSAA	81		25 - 150	05/30/22 12:03	06/02/22 17:40	1
13C3 HFPO-DA	79		25 - 150	05/30/22 12:03	06/02/22 17:40	1
18O2 PFHxS	82		25 - 150	05/30/22 12:03	06/02/22 17:40	1
13C3 PFBS	79		25 - 150	05/30/22 12:03	06/02/22 17:40	1
13C2 PFDoA	80		25 - 150	05/30/22 12:03	06/02/22 17:40	1
13C2 PFTeDA	75		25 - 150	05/30/22 12:03	06/02/22 17:40	1
13C5 PFNA	79		25 - 150	05/30/22 12:03	06/02/22 17:40	1
13C4 PFOA	83		25 - 150	05/30/22 12:03	06/02/22 17:40	1
13C2 PFUnA	82		25 - 150	05/30/22 12:03	06/02/22 17:40	1
13C4 PFHpA	91		25 - 150	05/30/22 12:03	06/02/22 17:40	1

Method: 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	82		2.4	0.52	ug/Kg	☼	05/30/22 12:03	06/05/22 18:38	10
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOS	83		25 - 150				05/30/22 12:03	06/05/22 18:38	10

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	18.0		0.1	0.1	%	-		05/27/22 10:41	1
Percent Solids	82.0		0.1	0.1	%	-		05/27/22 10:41	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P9:GW

Lab Sample ID: 320-88345-4

Date Collected: 05/23/22 10:00

Matrix: Water

Date Received: 05/26/22 09:35

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	11		1.8	0.52	ng/L		06/03/22 05:10	06/06/22 22:25	1
Perfluoroheptanoic acid (PFHpA)	1.3	J	1.8	0.22	ng/L		06/03/22 05:10	06/06/22 22:25	1
Perfluorooctanoic acid (PFOA)	6.8		1.8	0.76	ng/L		06/03/22 05:10	06/06/22 22:25	1
Perfluorononanoic acid (PFNA)	0.92	J	1.8	0.24	ng/L		06/03/22 05:10	06/06/22 22:25	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.28	ng/L		06/03/22 05:10	06/06/22 22:25	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.98	ng/L		06/03/22 05:10	06/06/22 22:25	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.49	ng/L		06/03/22 05:10	06/06/22 22:25	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		06/03/22 05:10	06/06/22 22:25	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.65	ng/L		06/03/22 05:10	06/06/22 22:25	1
Perfluorobutanesulfonic acid (PFBS)	7.3		1.8	0.18	ng/L		06/03/22 05:10	06/06/22 22:25	1
Perfluorohexanesulfonic acid (PFHxS)	120		1.8	0.51	ng/L		06/03/22 05:10	06/06/22 22:25	1
Perfluorooctanesulfonic acid (PFOS)	290		1.8	0.48	ng/L		06/03/22 05:10	06/06/22 22:25	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.5	1.1	ng/L		06/03/22 05:10	06/06/22 22:25	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.5	1.2	ng/L		06/03/22 05:10	06/06/22 22:25	1
F-53B Major	ND		1.8	0.21	ng/L		06/03/22 05:10	06/06/22 22:25	1
F-53B Minor	ND		1.8	0.29	ng/L		06/03/22 05:10	06/06/22 22:25	1
HFPO-DA (GenX)	ND		3.6	1.3	ng/L		06/03/22 05:10	06/06/22 22:25	1
DONA	ND		1.8	0.36	ng/L		06/03/22 05:10	06/06/22 22:25	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	93		25 - 150	06/03/22 05:10	06/06/22 22:25	1
13C2 PFDA	85		25 - 150	06/03/22 05:10	06/06/22 22:25	1
d5-NEtFOSAA	69		25 - 150	06/03/22 05:10	06/06/22 22:25	1
13C3 HFPO-DA	91		25 - 150	06/03/22 05:10	06/06/22 22:25	1
13C4 PFOS	91		25 - 150	06/03/22 05:10	06/06/22 22:25	1
d3-NMeFOSAA	78		25 - 150	06/03/22 05:10	06/06/22 22:25	1
18O2 PFHxS	97		25 - 150	06/03/22 05:10	06/06/22 22:25	1
13C3 PFBS	95		25 - 150	06/03/22 05:10	06/06/22 22:25	1
13C2 PFDoA	58		25 - 150	06/03/22 05:10	06/06/22 22:25	1
13C2 PFTeDA	53		25 - 150	06/03/22 05:10	06/06/22 22:25	1
13C5 PFNA	89		25 - 150	06/03/22 05:10	06/06/22 22:25	1
13C4 PFOA	95		25 - 150	06/03/22 05:10	06/06/22 22:25	1
13C2 PFUnA	73		25 - 150	06/03/22 05:10	06/06/22 22:25	1
13C4 PFHpA	92		25 - 150	06/03/22 05:10	06/06/22 22:25	1

Client Sample ID: FP-P1:0.2

Lab Sample ID: 320-88345-5

Date Collected: 05/23/22 11:30

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 88.6

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.057	J	0.22	0.034	ug/Kg	✱	06/01/22 19:03	06/03/22 02:54	1
Perfluoroheptanoic acid (PFHpA)	0.041	J	0.22	0.041	ug/Kg	✱	06/01/22 19:03	06/03/22 02:54	1
Perfluorooctanoic acid (PFOA)	ND		0.22	0.058	ug/Kg	✱	06/01/22 19:03	06/03/22 02:54	1
Perfluorononanoic acid (PFNA)	0.16	J	0.22	0.024	ug/Kg	✱	06/01/22 19:03	06/03/22 02:54	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.052	ug/Kg	✱	06/01/22 19:03	06/03/22 02:54	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.046	ug/Kg	✱	06/01/22 19:03	06/03/22 02:54	1

Eurofins Sacramento

Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P1:0.2

Lab Sample ID: 320-88345-5

Date Collected: 05/23/22 11:30

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 88.6

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.033	ug/Kg	☆	06/01/22 19:03	06/03/22 02:54	1
Perfluorotridecanoic acid (PFTrIA)	ND		0.22	0.023	ug/Kg	☆	06/01/22 19:03	06/03/22 02:54	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.040	ug/Kg	☆	06/01/22 19:03	06/03/22 02:54	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.041	ug/Kg	☆	06/01/22 19:03	06/03/22 02:54	1
Perfluorohexanesulfonic acid (PFHxS)	0.032	J	0.22	0.031	ug/Kg	☆	06/01/22 19:03	06/03/22 02:54	1
Perfluorooctanesulfonic acid (PFOS)	0.35		0.22	0.047	ug/Kg	☆	06/01/22 19:03	06/03/22 02:54	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.22	0.025	ug/Kg	☆	06/01/22 19:03	06/03/22 02:54	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.22	0.052	ug/Kg	☆	06/01/22 19:03	06/03/22 02:54	1
F-53B Major	ND		0.22	0.038	ug/Kg	☆	06/01/22 19:03	06/03/22 02:54	1
HFPO-DA (GenX)	ND		0.22	0.045	ug/Kg	☆	06/01/22 19:03	06/03/22 02:54	1
F-53B Minor	ND		0.22	0.034	ug/Kg	☆	06/01/22 19:03	06/03/22 02:54	1
DONA	ND		0.22	0.042	ug/Kg	☆	06/01/22 19:03	06/03/22 02:54	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	86		25 - 150				06/01/22 19:03	06/03/22 02:54	1
13C2 PFDA	90		25 - 150				06/01/22 19:03	06/03/22 02:54	1
13C4 PFOS	73		25 - 150				06/01/22 19:03	06/03/22 02:54	1
d3-NMeFOSAA	100		25 - 150				06/01/22 19:03	06/03/22 02:54	1
d5-NEtFOSAA	115		25 - 150				06/01/22 19:03	06/03/22 02:54	1
13C3 HFPO-DA	86		25 - 150				06/01/22 19:03	06/03/22 02:54	1
18O2 PFHxS	78		25 - 150				06/01/22 19:03	06/03/22 02:54	1
13C3 PFBS	82		25 - 150				06/01/22 19:03	06/03/22 02:54	1
13C2 PFDoA	94		25 - 150				06/01/22 19:03	06/03/22 02:54	1
13C2 PFTeDA	95		25 - 150				06/01/22 19:03	06/03/22 02:54	1
13C5 PFNA	90		25 - 150				06/01/22 19:03	06/03/22 02:54	1
13C4 PFOA	94		25 - 150				06/01/22 19:03	06/03/22 02:54	1
13C2 PFUnA	94		25 - 150				06/01/22 19:03	06/03/22 02:54	1
13C4 PFHpA	86		25 - 150				06/01/22 19:03	06/03/22 02:54	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	11.4		0.1	0.1	%			05/27/22 10:41	1
Percent Solids	88.6		0.1	0.1	%			05/27/22 10:41	1

Client Sample ID: FP-P1:10.2

Lab Sample ID: 320-88345-6

Date Collected: 05/23/22 11:35

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 76.2

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.24	0.038	ug/Kg	☆	06/01/22 19:03	06/03/22 03:24	1
Perfluoroheptanoic acid (PFHpA)	ND		0.24	0.046	ug/Kg	☆	06/01/22 19:03	06/03/22 03:24	1
Perfluorooctanoic acid (PFOA)	ND		0.24	0.064	ug/Kg	☆	06/01/22 19:03	06/03/22 03:24	1
Perfluorononanoic acid (PFNA)	ND		0.24	0.027	ug/Kg	☆	06/01/22 19:03	06/03/22 03:24	1
Perfluorodecanoic acid (PFDA)	ND		0.24	0.058	ug/Kg	☆	06/01/22 19:03	06/03/22 03:24	1
Perfluoroundecanoic acid (PFUnA)	ND		0.24	0.051	ug/Kg	☆	06/01/22 19:03	06/03/22 03:24	1
Perfluorododecanoic acid (PFDoA)	ND		0.24	0.036	ug/Kg	☆	06/01/22 19:03	06/03/22 03:24	1
Perfluorotridecanoic acid (PFTrIA)	ND		0.24	0.025	ug/Kg	☆	06/01/22 19:03	06/03/22 03:24	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P1:10.2

Lab Sample ID: 320-88345-6

Date Collected: 05/23/22 11:35

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 76.2

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorotetradecanoic acid (PFTeA)	ND		0.24	0.045	ug/Kg	☆	06/01/22 19:03	06/03/22 03:24	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.24	0.046	ug/Kg	☆	06/01/22 19:03	06/03/22 03:24	1
Perfluorohexanesulfonic acid (PFHxS)	0.051	J	0.24	0.035	ug/Kg	☆	06/01/22 19:03	06/03/22 03:24	1
Perfluorooctanesulfonic acid (PFOS)	0.26	I	0.24	0.052	ug/Kg	☆	06/01/22 19:03	06/03/22 03:24	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.24	0.028	ug/Kg	☆	06/01/22 19:03	06/03/22 03:24	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.24	0.058	ug/Kg	☆	06/01/22 19:03	06/03/22 03:24	1
F-53B Major	ND		0.24	0.042	ug/Kg	☆	06/01/22 19:03	06/03/22 03:24	1
HFPO-DA (GenX)	ND		0.24	0.050	ug/Kg	☆	06/01/22 19:03	06/03/22 03:24	1
F-53B Minor	ND		0.24	0.038	ug/Kg	☆	06/01/22 19:03	06/03/22 03:24	1
DONA	ND		0.24	0.047	ug/Kg	☆	06/01/22 19:03	06/03/22 03:24	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	89		25 - 150	06/01/22 19:03	06/03/22 03:24	1
13C2 PFDA	100		25 - 150	06/01/22 19:03	06/03/22 03:24	1
13C4 PFOS	90		25 - 150	06/01/22 19:03	06/03/22 03:24	1
d3-NMeFOSAA	108		25 - 150	06/01/22 19:03	06/03/22 03:24	1
d5-NEtFOSAA	114		25 - 150	06/01/22 19:03	06/03/22 03:24	1
13C3 HFPO-DA	92		25 - 150	06/01/22 19:03	06/03/22 03:24	1
18O2 PFHxS	86		25 - 150	06/01/22 19:03	06/03/22 03:24	1
13C3 PFBS	83		25 - 150	06/01/22 19:03	06/03/22 03:24	1
13C2 PFDoA	98		25 - 150	06/01/22 19:03	06/03/22 03:24	1
13C2 PFTeDA	88		25 - 150	06/01/22 19:03	06/03/22 03:24	1
13C5 PFNA	96		25 - 150	06/01/22 19:03	06/03/22 03:24	1
13C4 PFOA	92		25 - 150	06/01/22 19:03	06/03/22 03:24	1
13C2 PFUnA	93		25 - 150	06/01/22 19:03	06/03/22 03:24	1
13C4 PFHpA	94		25 - 150	06/01/22 19:03	06/03/22 03:24	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	23.8		0.1	0.1	%	-		05/27/22 10:41	1
Percent Solids	76.2		0.1	0.1	%	-		05/27/22 10:41	1

Client Sample ID: FP-P2:0.2

Lab Sample ID: 320-88345-8

Date Collected: 05/23/22 12:10

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 94.6

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.075	J	0.20	0.031	ug/Kg	☆	06/01/22 19:03	06/03/22 03:45	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.038	ug/Kg	☆	06/01/22 19:03	06/03/22 03:45	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.053	ug/Kg	☆	06/01/22 19:03	06/03/22 03:45	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.022	ug/Kg	☆	06/01/22 19:03	06/03/22 03:45	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.048	ug/Kg	☆	06/01/22 19:03	06/03/22 03:45	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.042	ug/Kg	☆	06/01/22 19:03	06/03/22 03:45	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.030	ug/Kg	☆	06/01/22 19:03	06/03/22 03:45	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.021	ug/Kg	☆	06/01/22 19:03	06/03/22 03:45	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.037	ug/Kg	☆	06/01/22 19:03	06/03/22 03:45	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.038	ug/Kg	☆	06/01/22 19:03	06/03/22 03:45	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P2:0.2

Lab Sample ID: 320-88345-8

Date Collected: 05/23/22 12:10

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 94.6

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanesulfonic acid (PFHxS)	0.14	J	0.20	0.029	ug/Kg	☆	06/01/22 19:03	06/03/22 03:45	1
Perfluorooctanesulfonic acid (PFOS)	0.53		0.20	0.043	ug/Kg	☆	06/01/22 19:03	06/03/22 03:45	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.20	0.023	ug/Kg	☆	06/01/22 19:03	06/03/22 03:45	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.20	0.048	ug/Kg	☆	06/01/22 19:03	06/03/22 03:45	1
F-53B Major	ND		0.20	0.035	ug/Kg	☆	06/01/22 19:03	06/03/22 03:45	1
HFPO-DA (GenX)	ND		0.20	0.041	ug/Kg	☆	06/01/22 19:03	06/03/22 03:45	1
F-53B Minor	ND		0.20	0.031	ug/Kg	☆	06/01/22 19:03	06/03/22 03:45	1
DONA	ND		0.20	0.039	ug/Kg	☆	06/01/22 19:03	06/03/22 03:45	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	91		25 - 150				06/01/22 19:03	06/03/22 03:45	1
13C2 PFDA	106		25 - 150				06/01/22 19:03	06/03/22 03:45	1
13C4 PFOS	84		25 - 150				06/01/22 19:03	06/03/22 03:45	1
d3-NMeFOSAA	89		25 - 150				06/01/22 19:03	06/03/22 03:45	1
d5-NEtFOSAA	119		25 - 150				06/01/22 19:03	06/03/22 03:45	1
13C3 HFPO-DA	98		25 - 150				06/01/22 19:03	06/03/22 03:45	1
18O2 PFHxS	81		25 - 150				06/01/22 19:03	06/03/22 03:45	1
13C3 PFBS	74		25 - 150				06/01/22 19:03	06/03/22 03:45	1
13C2 PFDoA	107		25 - 150				06/01/22 19:03	06/03/22 03:45	1
13C2 PFTeDA	95		25 - 150				06/01/22 19:03	06/03/22 03:45	1
13C5 PFNA	104		25 - 150				06/01/22 19:03	06/03/22 03:45	1
13C4 PFOA	94		25 - 150				06/01/22 19:03	06/03/22 03:45	1
13C2 PFUnA	99		25 - 150				06/01/22 19:03	06/03/22 03:45	1
13C4 PFHpA	100		25 - 150				06/01/22 19:03	06/03/22 03:45	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	5.4		0.1	0.1	%			05/27/22 10:41	1
Percent Solids	94.6		0.1	0.1	%			05/27/22 10:41	1

Client Sample ID: FP-P2:5.3

Lab Sample ID: 320-88345-9

Date Collected: 05/23/22 12:15

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 83.5

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	1.1		0.22	0.034	ug/Kg	☆	06/01/22 19:03	06/03/22 03:55	1
Perfluoroheptanoic acid (PFHpA)	0.40		0.22	0.041	ug/Kg	☆	06/01/22 19:03	06/03/22 03:55	1
Perfluorooctanoic acid (PFOA)	1.2		0.22	0.057	ug/Kg	☆	06/01/22 19:03	06/03/22 03:55	1
Perfluorononanoic acid (PFNA)	ND		0.22	0.024	ug/Kg	☆	06/01/22 19:03	06/03/22 03:55	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.052	ug/Kg	☆	06/01/22 19:03	06/03/22 03:55	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.045	ug/Kg	☆	06/01/22 19:03	06/03/22 03:55	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.032	ug/Kg	☆	06/01/22 19:03	06/03/22 03:55	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.023	ug/Kg	☆	06/01/22 19:03	06/03/22 03:55	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.040	ug/Kg	☆	06/01/22 19:03	06/03/22 03:55	1
Perfluorobutanesulfonic acid (PFBS)	0.24		0.22	0.041	ug/Kg	☆	06/01/22 19:03	06/03/22 03:55	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P2:5.3

Lab Sample ID: 320-88345-9

Date Collected: 05/23/22 12:15

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 83.5

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	1.6		0.22	0.046	ug/Kg	☆	06/01/22 19:03	06/03/22 03:55	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.22	0.025	ug/Kg	☆	06/01/22 19:03	06/03/22 03:55	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.22	0.052	ug/Kg	☆	06/01/22 19:03	06/03/22 03:55	1
F-53B Major	ND		0.22	0.038	ug/Kg	☆	06/01/22 19:03	06/03/22 03:55	1
HFPO-DA (GenX)	ND		0.22	0.044	ug/Kg	☆	06/01/22 19:03	06/03/22 03:55	1
F-53B Minor	ND		0.22	0.034	ug/Kg	☆	06/01/22 19:03	06/03/22 03:55	1
DONA	ND		0.22	0.042	ug/Kg	☆	06/01/22 19:03	06/03/22 03:55	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	82		25 - 150				06/01/22 19:03	06/03/22 03:55	1
13C2 PFDA	83		25 - 150				06/01/22 19:03	06/03/22 03:55	1
13C4 PFOS	77		25 - 150				06/01/22 19:03	06/03/22 03:55	1
d3-NMeFOSAA	83		25 - 150				06/01/22 19:03	06/03/22 03:55	1
d5-NEtFOSAA	92		25 - 150				06/01/22 19:03	06/03/22 03:55	1
13C3 HFPO-DA	80		25 - 150				06/01/22 19:03	06/03/22 03:55	1
13C3 PFBS	82		25 - 150				06/01/22 19:03	06/03/22 03:55	1
13C2 PFDoA	92		25 - 150				06/01/22 19:03	06/03/22 03:55	1
13C2 PFTeDA	86		25 - 150				06/01/22 19:03	06/03/22 03:55	1
13C5 PFNA	85		25 - 150				06/01/22 19:03	06/03/22 03:55	1
13C4 PFOA	85		25 - 150				06/01/22 19:03	06/03/22 03:55	1
13C2 PFUnA	84		25 - 150				06/01/22 19:03	06/03/22 03:55	1
13C4 PFHpA	83		25 - 150				06/01/22 19:03	06/03/22 03:55	1

Method: 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanesulfonic acid (PFHxS)	24		1.1	0.16	ug/Kg	☆	06/01/22 19:03	06/03/22 19:02	5
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
18O2 PFHxS	92		25 - 150				06/01/22 19:03	06/03/22 19:02	5

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	16.5		0.1	0.1	%			05/27/22 10:41	1
Percent Solids	83.5		0.1	0.1	%			05/27/22 10:41	1

Client Sample ID: FP-P2:GW

Lab Sample ID: 320-88345-11

Date Collected: 05/23/22 12:40

Matrix: Water

Date Received: 05/26/22 09:35

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	99		1.8	0.52	ng/L		06/03/22 05:10	06/06/22 22:35	1
Perfluoroheptanoic acid (PFHpA)	23		1.8	0.23	ng/L		06/03/22 05:10	06/06/22 22:35	1
Perfluorooctanoic acid (PFOA)	3.8		1.8	0.77	ng/L		06/03/22 05:10	06/06/22 22:35	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.24	ng/L		06/03/22 05:10	06/06/22 22:35	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.28	ng/L		06/03/22 05:10	06/06/22 22:35	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.99	ng/L		06/03/22 05:10	06/06/22 22:35	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.50	ng/L		06/03/22 05:10	06/06/22 22:35	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		06/03/22 05:10	06/06/22 22:35	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P2:GW

Lab Sample ID: 320-88345-11

Date Collected: 05/23/22 12:40

Matrix: Water

Date Received: 05/26/22 09:35

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.66	ng/L		06/03/22 05:10	06/06/22 22:35	1
Perfluorobutanesulfonic acid (PFBS)	55		1.8	0.18	ng/L		06/03/22 05:10	06/06/22 22:35	1
Perfluorooctanesulfonic acid (PFOS)	19		1.8	0.49	ng/L		06/03/22 05:10	06/06/22 22:35	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.5	1.1	ng/L		06/03/22 05:10	06/06/22 22:35	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.5	1.2	ng/L		06/03/22 05:10	06/06/22 22:35	1
F-53B Major	ND		1.8	0.22	ng/L		06/03/22 05:10	06/06/22 22:35	1
F-53B Minor	ND		1.8	0.29	ng/L		06/03/22 05:10	06/06/22 22:35	1
HFPO-DA (GenX)	ND		3.6	1.4	ng/L		06/03/22 05:10	06/06/22 22:35	1
DONA	ND		1.8	0.36	ng/L		06/03/22 05:10	06/06/22 22:35	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	96		25 - 150				06/03/22 05:10	06/06/22 22:35	1
13C2 PFDA	88		25 - 150				06/03/22 05:10	06/06/22 22:35	1
d5-NEtFOSAA	79		25 - 150				06/03/22 05:10	06/06/22 22:35	1
13C3 HFPO-DA	88		25 - 150				06/03/22 05:10	06/06/22 22:35	1
13C4 PFOS	88		25 - 150				06/03/22 05:10	06/06/22 22:35	1
d3-NMeFOSAA	85		25 - 150				06/03/22 05:10	06/06/22 22:35	1
13C3 PFBS	97		25 - 150				06/03/22 05:10	06/06/22 22:35	1
13C2 PFDoA	69		25 - 150				06/03/22 05:10	06/06/22 22:35	1
13C2 PFTeDA	52		25 - 150				06/03/22 05:10	06/06/22 22:35	1
13C5 PFNA	91		25 - 150				06/03/22 05:10	06/06/22 22:35	1
13C4 PFOA	92		25 - 150				06/03/22 05:10	06/06/22 22:35	1
13C2 PFUnA	81		25 - 150				06/03/22 05:10	06/06/22 22:35	1
13C4 PFHpA	94		25 - 150				06/03/22 05:10	06/06/22 22:35	1

Method: 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanesulfonic acid (PFHxS)	530		9.0	2.6	ng/L		06/03/22 05:10	06/11/22 10:39	5
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
18O2 PFHxS	103		25 - 150				06/03/22 05:10	06/11/22 10:39	5

Client Sample ID: FP-P3:1.2

Lab Sample ID: 320-88345-12

Date Collected: 05/23/22 13:30

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 72.5

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	6.0		0.27	0.041	ug/Kg	✱	06/01/22 19:03	06/03/22 04:35	1
Perfluoroheptanoic acid (PFHpA)	2.8		0.27	0.051	ug/Kg	✱	06/01/22 19:03	06/03/22 04:35	1
Perfluorooctanoic acid (PFOA)	0.082	J	0.27	0.071	ug/Kg	✱	06/01/22 19:03	06/03/22 04:35	1
Perfluorononanoic acid (PFNA)	0.083	J	0.27	0.029	ug/Kg	✱	06/01/22 19:03	06/03/22 04:35	1
Perfluorodecanoic acid (PFDA)	ND		0.27	0.064	ug/Kg	✱	06/01/22 19:03	06/03/22 04:35	1
Perfluoroundecanoic acid (PFUnA)	ND		0.27	0.056	ug/Kg	✱	06/01/22 19:03	06/03/22 04:35	1
Perfluorododecanoic acid (PFDoA)	ND		0.27	0.040	ug/Kg	✱	06/01/22 19:03	06/03/22 04:35	1
Perfluorotridecanoic acid (PFTriA)	ND		0.27	0.028	ug/Kg	✱	06/01/22 19:03	06/03/22 04:35	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.27	0.049	ug/Kg	✱	06/01/22 19:03	06/03/22 04:35	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.27	0.051	ug/Kg	✱	06/01/22 19:03	06/03/22 04:35	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P3:1.2

Lab Sample ID: 320-88345-12

Date Collected: 05/23/22 13:30

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 72.5

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanesulfonic acid (PFHxS)	0.11	J I	0.27	0.039	ug/Kg	☆	06/01/22 19:03	06/03/22 04:35	1
Perfluorooctanesulfonic acid (PFOS)	7.3		0.27	0.057	ug/Kg	☆	06/01/22 19:03	06/03/22 04:35	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.27	0.031	ug/Kg	☆	06/01/22 19:03	06/03/22 04:35	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.27	0.064	ug/Kg	☆	06/01/22 19:03	06/03/22 04:35	1
F-53B Major	ND		0.27	0.047	ug/Kg	☆	06/01/22 19:03	06/03/22 04:35	1
HFPO-DA (GenX)	ND		0.27	0.055	ug/Kg	☆	06/01/22 19:03	06/03/22 04:35	1
F-53B Minor	ND		0.27	0.041	ug/Kg	☆	06/01/22 19:03	06/03/22 04:35	1
DONA	ND		0.27	0.052	ug/Kg	☆	06/01/22 19:03	06/03/22 04:35	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	89		25 - 150				06/01/22 19:03	06/03/22 04:35	1
13C2 PFDA	89		25 - 150				06/01/22 19:03	06/03/22 04:35	1
13C4 PFOS	83		25 - 150				06/01/22 19:03	06/03/22 04:35	1
d3-NMeFOSAA	104		25 - 150				06/01/22 19:03	06/03/22 04:35	1
d5-NEtFOSAA	112		25 - 150				06/01/22 19:03	06/03/22 04:35	1
13C3 HFPO-DA	86		25 - 150				06/01/22 19:03	06/03/22 04:35	1
18O2 PFHxS	85		25 - 150				06/01/22 19:03	06/03/22 04:35	1
13C3 PFBS	83		25 - 150				06/01/22 19:03	06/03/22 04:35	1
13C2 PFDoA	93		25 - 150				06/01/22 19:03	06/03/22 04:35	1
13C2 PFTeDA	85		25 - 150				06/01/22 19:03	06/03/22 04:35	1
13C5 PFNA	88		25 - 150				06/01/22 19:03	06/03/22 04:35	1
13C4 PFOA	86		25 - 150				06/01/22 19:03	06/03/22 04:35	1
13C2 PFUnA	90		25 - 150				06/01/22 19:03	06/03/22 04:35	1
13C4 PFHpA	92		25 - 150				06/01/22 19:03	06/03/22 04:35	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	27.5		0.1	0.1	%			05/27/22 10:41	1
Percent Solids	72.5		0.1	0.1	%			05/27/22 10:41	1

Client Sample ID: FP-P3:6.3

Lab Sample ID: 320-88345-13

Date Collected: 05/23/22 13:35

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 80.6

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	3.0		0.23	0.036	ug/Kg	☆	06/01/22 19:03	06/03/22 04:45	1
Perfluoroheptanoic acid (PFHpA)	0.63		0.23	0.044	ug/Kg	☆	06/01/22 19:03	06/03/22 04:45	1
Perfluorooctanoic acid (PFOA)	ND		0.23	0.061	ug/Kg	☆	06/01/22 19:03	06/03/22 04:45	1
Perfluorononanoic acid (PFNA)	ND		0.23	0.025	ug/Kg	☆	06/01/22 19:03	06/03/22 04:45	1
Perfluorodecanoic acid (PFDA)	ND		0.23	0.055	ug/Kg	☆	06/01/22 19:03	06/03/22 04:45	1
Perfluoroundecanoic acid (PFUnA)	ND		0.23	0.048	ug/Kg	☆	06/01/22 19:03	06/03/22 04:45	1
Perfluorododecanoic acid (PFDoA)	ND		0.23	0.034	ug/Kg	☆	06/01/22 19:03	06/03/22 04:45	1
Perfluorotridecanoic acid (PFTriA)	ND		0.23	0.024	ug/Kg	☆	06/01/22 19:03	06/03/22 04:45	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.23	0.042	ug/Kg	☆	06/01/22 19:03	06/03/22 04:45	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.23	0.044	ug/Kg	☆	06/01/22 19:03	06/03/22 04:45	1
Perfluorohexanesulfonic acid (PFHxS)	0.14	J	0.23	0.033	ug/Kg	☆	06/01/22 19:03	06/03/22 04:45	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P3:6.3

Lab Sample ID: 320-88345-13

Date Collected: 05/23/22 13:35

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 80.6

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.11	J	0.23	0.049	ug/Kg	☆	06/01/22 19:03	06/03/22 04:45	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.23	0.026	ug/Kg	☆	06/01/22 19:03	06/03/22 04:45	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.23	0.055	ug/Kg	☆	06/01/22 19:03	06/03/22 04:45	1
F-53B Major	ND		0.23	0.040	ug/Kg	☆	06/01/22 19:03	06/03/22 04:45	1
HFPO-DA (GenX)	ND		0.23	0.047	ug/Kg	☆	06/01/22 19:03	06/03/22 04:45	1
F-53B Minor	ND		0.23	0.036	ug/Kg	☆	06/01/22 19:03	06/03/22 04:45	1
DONA	ND		0.23	0.045	ug/Kg	☆	06/01/22 19:03	06/03/22 04:45	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	101		25 - 150				06/01/22 19:03	06/03/22 04:45	1
13C2 PFDA	108		25 - 150				06/01/22 19:03	06/03/22 04:45	1
13C4 PFOS	99		25 - 150				06/01/22 19:03	06/03/22 04:45	1
d3-NMeFOSAA	109		25 - 150				06/01/22 19:03	06/03/22 04:45	1
d5-NEtFOSAA	130		25 - 150				06/01/22 19:03	06/03/22 04:45	1
13C3 HFPO-DA	104		25 - 150				06/01/22 19:03	06/03/22 04:45	1
18O2 PFHxS	110		25 - 150				06/01/22 19:03	06/03/22 04:45	1
13C3 PFBS	99		25 - 150				06/01/22 19:03	06/03/22 04:45	1
13C2 PFDoA	115		25 - 150				06/01/22 19:03	06/03/22 04:45	1
13C2 PFTeDA	100		25 - 150				06/01/22 19:03	06/03/22 04:45	1
13C5 PFNA	104		25 - 150				06/01/22 19:03	06/03/22 04:45	1
13C4 PFOA	96		25 - 150				06/01/22 19:03	06/03/22 04:45	1
13C2 PFUnA	96		25 - 150				06/01/22 19:03	06/03/22 04:45	1
13C4 PFHpA	107		25 - 150				06/01/22 19:03	06/03/22 04:45	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	19.4		0.1	0.1	%			05/27/22 10:41	1
Percent Solids	80.6		0.1	0.1	%			05/27/22 10:41	1

Client Sample ID: FP-SH1:0.5

Lab Sample ID: 320-88345-15

Date Collected: 05/23/22 13:50

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 88.1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	5.9		0.22	0.035	ug/Kg	☆	06/01/22 19:03	06/03/22 05:06	1
Perfluoroheptanoic acid (PFHpA)	0.97		0.22	0.042	ug/Kg	☆	06/01/22 19:03	06/03/22 05:06	1
Perfluorooctanoic acid (PFOA)	0.70		0.22	0.059	ug/Kg	☆	06/01/22 19:03	06/03/22 05:06	1
Perfluorononanoic acid (PFNA)	1.2		0.22	0.025	ug/Kg	☆	06/01/22 19:03	06/03/22 05:06	1
Perfluorodecanoic acid (PFDA)	1.9		0.22	0.054	ug/Kg	☆	06/01/22 19:03	06/03/22 05:06	1
Perfluoroundecanoic acid (PFUnA)	0.74		0.22	0.047	ug/Kg	☆	06/01/22 19:03	06/03/22 05:06	1
Perfluorododecanoic acid (PFDoA)	0.32		0.22	0.033	ug/Kg	☆	06/01/22 19:03	06/03/22 05:06	1
Perfluorotridecanoic acid (PFTriA)	0.097	J	0.22	0.023	ug/Kg	☆	06/01/22 19:03	06/03/22 05:06	1
Perfluorotetradecanoic acid (PFTeA)	0.087	J	0.22	0.041	ug/Kg	☆	06/01/22 19:03	06/03/22 05:06	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.042	ug/Kg	☆	06/01/22 19:03	06/03/22 05:06	1
Perfluorohexanesulfonic acid (PFHxS)	0.20	J	0.22	0.032	ug/Kg	☆	06/01/22 19:03	06/03/22 05:06	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-SH1:0.5

Lab Sample ID: 320-88345-15

Date Collected: 05/23/22 13:50

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 88.1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	5.1		0.22	0.048	ug/Kg	☆	06/01/22 19:03	06/03/22 05:06	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.22	0.026	ug/Kg	☆	06/01/22 19:03	06/03/22 05:06	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.22	0.054	ug/Kg	☆	06/01/22 19:03	06/03/22 05:06	1
F-53B Major	ND		0.22	0.039	ug/Kg	☆	06/01/22 19:03	06/03/22 05:06	1
HFPO-DA (GenX)	ND		0.22	0.046	ug/Kg	☆	06/01/22 19:03	06/03/22 05:06	1
F-53B Minor	ND		0.22	0.035	ug/Kg	☆	06/01/22 19:03	06/03/22 05:06	1
DONA	ND		0.22	0.043	ug/Kg	☆	06/01/22 19:03	06/03/22 05:06	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	95		25 - 150				06/01/22 19:03	06/03/22 05:06	1
13C2 PFDA	101		25 - 150				06/01/22 19:03	06/03/22 05:06	1
13C4 PFOS	91		25 - 150				06/01/22 19:03	06/03/22 05:06	1
d3-NMeFOSAA	99		25 - 150				06/01/22 19:03	06/03/22 05:06	1
d5-NEtFOSAA	113		25 - 150				06/01/22 19:03	06/03/22 05:06	1
13C3 HFPO-DA	97		25 - 150				06/01/22 19:03	06/03/22 05:06	1
18O2 PFHxS	80		25 - 150				06/01/22 19:03	06/03/22 05:06	1
13C3 PFBS	91		25 - 150				06/01/22 19:03	06/03/22 05:06	1
13C2 PFDoA	101		25 - 150				06/01/22 19:03	06/03/22 05:06	1
13C2 PFTeDA	96		25 - 150				06/01/22 19:03	06/03/22 05:06	1
13C5 PFNA	101		25 - 150				06/01/22 19:03	06/03/22 05:06	1
13C4 PFOA	94		25 - 150				06/01/22 19:03	06/03/22 05:06	1
13C2 PFUnA	104		25 - 150				06/01/22 19:03	06/03/22 05:06	1
13C4 PFHpA	92		25 - 150				06/01/22 19:03	06/03/22 05:06	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	11.9		0.1	0.1	%			05/27/22 10:41	1
Percent Solids	88.1		0.1	0.1	%			05/27/22 10:41	1

Client Sample ID: FP-P3:GW

Lab Sample ID: 320-88345-16

Date Collected: 05/23/22 14:20

Matrix: Water

Date Received: 05/26/22 09:35

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	12		1.7	0.74	ng/L		06/03/22 05:10	06/06/22 22:46	1
Perfluorononanoic acid (PFNA)	ND		1.7	0.24	ng/L		06/03/22 05:10	06/06/22 22:46	1
Perfluorodecanoic acid (PFDA)	ND		1.7	0.27	ng/L		06/03/22 05:10	06/06/22 22:46	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.96	ng/L		06/03/22 05:10	06/06/22 22:46	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.48	ng/L		06/03/22 05:10	06/06/22 22:46	1
Perfluorotridecanoic acid (PFTriA)	ND		1.7	1.1	ng/L		06/03/22 05:10	06/06/22 22:46	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.7	0.64	ng/L		06/03/22 05:10	06/06/22 22:46	1
Perfluorobutanesulfonic acid (PFBS)	9.4		1.7	0.17	ng/L		06/03/22 05:10	06/06/22 22:46	1
Perfluorohexanesulfonic acid (PFHxS)	130		1.7	0.50	ng/L		06/03/22 05:10	06/06/22 22:46	1
Perfluorooctanesulfonic acid (PFOS)	1.9		1.7	0.47	ng/L		06/03/22 05:10	06/06/22 22:46	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.4	1.0	ng/L		06/03/22 05:10	06/06/22 22:46	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P3:GW

Lab Sample ID: 320-88345-16

Date Collected: 05/23/22 14:20

Matrix: Water

Date Received: 05/26/22 09:35

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.4	1.1	ng/L		06/03/22 05:10	06/06/22 22:46	1
F-53B Major	ND		1.7	0.21	ng/L		06/03/22 05:10	06/06/22 22:46	1
F-53B Minor	ND		1.7	0.28	ng/L		06/03/22 05:10	06/06/22 22:46	1
HFPO-DA (GenX)	ND		3.5	1.3	ng/L		06/03/22 05:10	06/06/22 22:46	1
DONA	ND		1.7	0.35	ng/L		06/03/22 05:10	06/06/22 22:46	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	142		25 - 150				06/03/22 05:10	06/06/22 22:46	1
d5-NEtFOSAA	120		25 - 150				06/03/22 05:10	06/06/22 22:46	1
13C3 HFPO-DA	141		25 - 150				06/03/22 05:10	06/06/22 22:46	1
13C4 PFOS	129		25 - 150				06/03/22 05:10	06/06/22 22:46	1
d3-NMeFOSAA	126		25 - 150				06/03/22 05:10	06/06/22 22:46	1
18O2 PFHxS	152	*5+	25 - 150				06/03/22 05:10	06/06/22 22:46	1
13C3 PFBS	125		25 - 150				06/03/22 05:10	06/06/22 22:46	1
13C2 PFDoA	108		25 - 150				06/03/22 05:10	06/06/22 22:46	1
13C2 PFTeDA	87		25 - 150				06/03/22 05:10	06/06/22 22:46	1
13C5 PFNA	143		25 - 150				06/03/22 05:10	06/06/22 22:46	1
13C4 PFOA	92		25 - 150				06/03/22 05:10	06/06/22 22:46	1
13C2 PFUnA	116		25 - 150				06/03/22 05:10	06/06/22 22:46	1

Method: 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	660		17	2.2	ng/L		06/03/22 05:10	06/11/22 11:00	10
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFHpA	102		25 - 150				06/03/22 05:10	06/11/22 11:00	10

Method: 537 (modified) - Fluorinated Alkyl Substances - DL2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	3500		35	10	ng/L		06/03/22 05:10	06/20/22 11:39	20
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	98		25 - 150				06/03/22 05:10	06/20/22 11:39	20

Client Sample ID: FP-P4:1.4

Lab Sample ID: 320-88345-17

Date Collected: 05/23/22 15:15

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 91.4

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.58		0.20	0.030	ug/Kg	☆	06/01/22 19:03	06/03/22 05:16	1
Perfluoroheptanoic acid (PFHpA)	0.62		0.20	0.037	ug/Kg	☆	06/01/22 19:03	06/03/22 05:16	1
Perfluorooctanoic acid (PFOA)	0.48		0.20	0.052	ug/Kg	☆	06/01/22 19:03	06/03/22 05:16	1
Perfluorononanoic acid (PFNA)	0.47		0.20	0.022	ug/Kg	☆	06/01/22 19:03	06/03/22 05:16	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.047	ug/Kg	☆	06/01/22 19:03	06/03/22 05:16	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.041	ug/Kg	☆	06/01/22 19:03	06/03/22 05:16	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.029	ug/Kg	☆	06/01/22 19:03	06/03/22 05:16	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.021	ug/Kg	☆	06/01/22 19:03	06/03/22 05:16	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.036	ug/Kg	☆	06/01/22 19:03	06/03/22 05:16	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.037	ug/Kg	☆	06/01/22 19:03	06/03/22 05:16	1
Perfluorohexanesulfonic acid (PFHxS)	0.24		0.20	0.028	ug/Kg	☆	06/01/22 19:03	06/03/22 05:16	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P4:1.4

Lab Sample ID: 320-88345-17

Date Collected: 05/23/22 15:15

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 91.4

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	3.0		0.20	0.042	ug/Kg	☆	06/01/22 19:03	06/03/22 05:16	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.20	0.023	ug/Kg	☆	06/01/22 19:03	06/03/22 05:16	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.20	0.047	ug/Kg	☆	06/01/22 19:03	06/03/22 05:16	1
F-53B Major	ND		0.20	0.034	ug/Kg	☆	06/01/22 19:03	06/03/22 05:16	1
HFPO-DA (GenX)	ND		0.20	0.040	ug/Kg	☆	06/01/22 19:03	06/03/22 05:16	1
F-53B Minor	ND		0.20	0.030	ug/Kg	☆	06/01/22 19:03	06/03/22 05:16	1
DONA	ND		0.20	0.038	ug/Kg	☆	06/01/22 19:03	06/03/22 05:16	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	89		25 - 150				06/01/22 19:03	06/03/22 05:16	1
13C2 PFDA	92		25 - 150				06/01/22 19:03	06/03/22 05:16	1
13C4 PFOS	76		25 - 150				06/01/22 19:03	06/03/22 05:16	1
d3-NMeFOSAA	96		25 - 150				06/01/22 19:03	06/03/22 05:16	1
d5-NEtFOSAA	105		25 - 150				06/01/22 19:03	06/03/22 05:16	1
13C3 HFPO-DA	91		25 - 150				06/01/22 19:03	06/03/22 05:16	1
18O2 PFHxS	85		25 - 150				06/01/22 19:03	06/03/22 05:16	1
13C3 PFBS	75		25 - 150				06/01/22 19:03	06/03/22 05:16	1
13C2 PFDoA	94		25 - 150				06/01/22 19:03	06/03/22 05:16	1
13C2 PFTeDA	88		25 - 150				06/01/22 19:03	06/03/22 05:16	1
13C5 PFNA	93		25 - 150				06/01/22 19:03	06/03/22 05:16	1
13C4 PFOA	87		25 - 150				06/01/22 19:03	06/03/22 05:16	1
13C2 PFUnA	84		25 - 150				06/01/22 19:03	06/03/22 05:16	1
13C4 PFHpA	90		25 - 150				06/01/22 19:03	06/03/22 05:16	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	8.6		0.1	0.1	%			05/27/22 10:41	1
Percent Solids	91.4		0.1	0.1	%			05/27/22 10:41	1

Client Sample ID: FP-P4:11.6

Lab Sample ID: 320-88345-18

Date Collected: 05/23/22 15:20

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 77.7

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	3.0		0.25	0.038	ug/Kg	☆	06/01/22 19:03	06/03/22 05:26	1
Perfluoroheptanoic acid (PFHpA)	1.3		0.25	0.047	ug/Kg	☆	06/01/22 19:03	06/03/22 05:26	1
Perfluorooctanoic acid (PFOA)	0.53		0.25	0.065	ug/Kg	☆	06/01/22 19:03	06/03/22 05:26	1
Perfluorononanoic acid (PFNA)	0.028	J	0.25	0.027	ug/Kg	☆	06/01/22 19:03	06/03/22 05:26	1
Perfluorodecanoic acid (PFDA)	ND		0.25	0.059	ug/Kg	☆	06/01/22 19:03	06/03/22 05:26	1
Perfluoroundecanoic acid (PFUnA)	ND		0.25	0.051	ug/Kg	☆	06/01/22 19:03	06/03/22 05:26	1
Perfluorododecanoic acid (PFDoA)	ND		0.25	0.037	ug/Kg	☆	06/01/22 19:03	06/03/22 05:26	1
Perfluorotridecanoic acid (PFTriA)	ND		0.25	0.026	ug/Kg	☆	06/01/22 19:03	06/03/22 05:26	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.25	0.045	ug/Kg	☆	06/01/22 19:03	06/03/22 05:26	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.25	0.047	ug/Kg	☆	06/01/22 19:03	06/03/22 05:26	1
Perfluorohexanesulfonic acid (PFHxS)	0.27		0.25	0.036	ug/Kg	☆	06/01/22 19:03	06/03/22 05:26	1
Perfluorooctanesulfonic acid (PFOS)	0.12	J	0.25	0.053	ug/Kg	☆	06/01/22 19:03	06/03/22 05:26	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P4:11.6

Lab Sample ID: 320-88345-18

Date Collected: 05/23/22 15:20

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 77.7

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.25	0.028	ug/Kg	✱	06/01/22 19:03	06/03/22 05:26	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.25	0.059	ug/Kg	✱	06/01/22 19:03	06/03/22 05:26	1
F-53B Major	ND		0.25	0.043	ug/Kg	✱	06/01/22 19:03	06/03/22 05:26	1
HFPO-DA (GenX)	ND		0.25	0.050	ug/Kg	✱	06/01/22 19:03	06/03/22 05:26	1
F-53B Minor	ND		0.25	0.038	ug/Kg	✱	06/01/22 19:03	06/03/22 05:26	1
DONA	ND		0.25	0.048	ug/Kg	✱	06/01/22 19:03	06/03/22 05:26	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	93		25 - 150				06/01/22 19:03	06/03/22 05:26	1
13C2 PFDA	101		25 - 150				06/01/22 19:03	06/03/22 05:26	1
13C4 PFOS	86		25 - 150				06/01/22 19:03	06/03/22 05:26	1
d3-NMeFOSAA	105		25 - 150				06/01/22 19:03	06/03/22 05:26	1
d5-NEtFOSAA	126		25 - 150				06/01/22 19:03	06/03/22 05:26	1
13C3 HFPO-DA	95		25 - 150				06/01/22 19:03	06/03/22 05:26	1
18O2 PFHxS	93		25 - 150				06/01/22 19:03	06/03/22 05:26	1
13C3 PFBS	90		25 - 150				06/01/22 19:03	06/03/22 05:26	1
13C2 PFDoA	108		25 - 150				06/01/22 19:03	06/03/22 05:26	1
13C2 PFTeDA	103		25 - 150				06/01/22 19:03	06/03/22 05:26	1
13C5 PFNA	98		25 - 150				06/01/22 19:03	06/03/22 05:26	1
13C4 PFOA	102		25 - 150				06/01/22 19:03	06/03/22 05:26	1
13C2 PFUnA	101		25 - 150				06/01/22 19:03	06/03/22 05:26	1
13C4 PFHpA	98		25 - 150				06/01/22 19:03	06/03/22 05:26	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	22.3		0.1	0.1	%			05/27/22 10:41	1
Percent Solids	77.7		0.1	0.1	%			05/27/22 10:41	1

Client Sample ID: FP-P4:GW

Lab Sample ID: 320-88345-20

Date Collected: 05/23/22 15:55

Matrix: Water

Date Received: 05/26/22 09:35

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	320		1.8	0.22	ng/L		06/03/22 05:10	06/06/22 22:56	1
Perfluorooctanoic acid (PFOA)	180		1.8	0.76	ng/L		06/03/22 05:10	06/06/22 22:56	1
Perfluorononanoic acid (PFNA)	7.1		1.8	0.24	ng/L		06/03/22 05:10	06/06/22 22:56	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.28	ng/L		06/03/22 05:10	06/06/22 22:56	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.99	ng/L		06/03/22 05:10	06/06/22 22:56	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.49	ng/L		06/03/22 05:10	06/06/22 22:56	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		06/03/22 05:10	06/06/22 22:56	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.65	ng/L		06/03/22 05:10	06/06/22 22:56	1
Perfluorobutanesulfonic acid (PFBS)	79		1.8	0.18	ng/L		06/03/22 05:10	06/06/22 22:56	1
Perfluorooctanesulfonic acid (PFOS)	89		1.8	0.48	ng/L		06/03/22 05:10	06/06/22 22:56	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.5	1.1	ng/L		06/03/22 05:10	06/06/22 22:56	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.5	1.2	ng/L		06/03/22 05:10	06/06/22 22:56	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P4:GW

Lab Sample ID: 320-88345-20

Date Collected: 05/23/22 15:55

Matrix: Water

Date Received: 05/26/22 09:35

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
F-53B Major	ND		1.8	0.22	ng/L		06/03/22 05:10	06/06/22 22:56	1
F-53B Minor	ND		1.8	0.29	ng/L		06/03/22 05:10	06/06/22 22:56	1
HFPO-DA (GenX)	ND		3.6	1.3	ng/L		06/03/22 05:10	06/06/22 22:56	1
DONA	ND		1.8	0.36	ng/L		06/03/22 05:10	06/06/22 22:56	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	87		25 - 150				06/03/22 05:10	06/06/22 22:56	1
d5-NEtFOSAA	78		25 - 150				06/03/22 05:10	06/06/22 22:56	1
13C3 HFPO-DA	97		25 - 150				06/03/22 05:10	06/06/22 22:56	1
13C4 PFOS	88		25 - 150				06/03/22 05:10	06/06/22 22:56	1
d3-NMeFOSAA	86		25 - 150				06/03/22 05:10	06/06/22 22:56	1
13C3 PFBS	91		25 - 150				06/03/22 05:10	06/06/22 22:56	1
13C2 PFDoA	76		25 - 150				06/03/22 05:10	06/06/22 22:56	1
13C2 PFTeDA	59		25 - 150				06/03/22 05:10	06/06/22 22:56	1
13C5 PFNA	93		25 - 150				06/03/22 05:10	06/06/22 22:56	1
13C4 PFOA	91		25 - 150				06/03/22 05:10	06/06/22 22:56	1
13C2 PFUnA	78		25 - 150				06/03/22 05:10	06/06/22 22:56	1
13C4 PFHpA	92		25 - 150				06/03/22 05:10	06/06/22 22:56	1

Method: 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	1000		9.0	2.6	ng/L		06/03/22 05:10	06/11/22 10:50	5
Perfluorohexanesulfonic acid (PFHxS)	440		9.0	2.6	ng/L		06/03/22 05:10	06/11/22 10:50	5
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	89		25 - 150				06/03/22 05:10	06/11/22 10:50	5
18O2 PFHxS	92		25 - 150				06/03/22 05:10	06/11/22 10:50	5

Client Sample ID: FP-SH2:0.5

Lab Sample ID: 320-88345-21

Date Collected: 05/23/22 16:00

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 89.2

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	2.0		0.21	0.032	ug/Kg	✱	06/01/22 19:03	06/03/22 05:46	1
Perfluoroheptanoic acid (PFHpA)	0.84		0.21	0.039	ug/Kg	✱	06/01/22 19:03	06/03/22 05:46	1
Perfluorooctanoic acid (PFOA)	0.50		0.21	0.055	ug/Kg	✱	06/01/22 19:03	06/03/22 05:46	1
Perfluorononanoic acid (PFNA)	1.8		0.21	0.023	ug/Kg	✱	06/01/22 19:03	06/03/22 05:46	1
Perfluorodecanoic acid (PFDA)	3.5		0.21	0.050	ug/Kg	✱	06/01/22 19:03	06/03/22 05:46	1
Perfluoroundecanoic acid (PFUnA)	1.4		0.21	0.044	ug/Kg	✱	06/01/22 19:03	06/03/22 05:46	1
Perfluorododecanoic acid (PFDoA)	0.26		0.21	0.031	ug/Kg	✱	06/01/22 19:03	06/03/22 05:46	1
Perfluorotridecanoic acid (PFTriA)	0.085 J		0.21	0.022	ug/Kg	✱	06/01/22 19:03	06/03/22 05:46	1
Perfluorotetradecanoic acid (PFTeA)	0.068 J		0.21	0.038	ug/Kg	✱	06/01/22 19:03	06/03/22 05:46	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.039	ug/Kg	✱	06/01/22 19:03	06/03/22 05:46	1
Perfluorohexanesulfonic acid (PFHxS)	0.26		0.21	0.030	ug/Kg	✱	06/01/22 19:03	06/03/22 05:46	1
Perfluorooctanesulfonic acid (PFOS)	4.7		0.21	0.045	ug/Kg	✱	06/01/22 19:03	06/03/22 05:46	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-SH2:0.5

Lab Sample ID: 320-88345-21

Date Collected: 05/23/22 16:00

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 89.2

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.21	0.024	ug/Kg	☆	06/01/22 19:03	06/03/22 05:46	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.21	0.050	ug/Kg	☆	06/01/22 19:03	06/03/22 05:46	1
F-53B Major	ND		0.21	0.036	ug/Kg	☆	06/01/22 19:03	06/03/22 05:46	1
HFPO-DA (GenX)	ND		0.21	0.043	ug/Kg	☆	06/01/22 19:03	06/03/22 05:46	1
F-53B Minor	ND		0.21	0.032	ug/Kg	☆	06/01/22 19:03	06/03/22 05:46	1
DONA	ND		0.21	0.040	ug/Kg	☆	06/01/22 19:03	06/03/22 05:46	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	85		25 - 150				06/01/22 19:03	06/03/22 05:46	1
13C2 PFDA	88		25 - 150				06/01/22 19:03	06/03/22 05:46	1
13C4 PFOS	78		25 - 150				06/01/22 19:03	06/03/22 05:46	1
d3-NMeFOSAA	99		25 - 150				06/01/22 19:03	06/03/22 05:46	1
d5-NEtFOSAA	104		25 - 150				06/01/22 19:03	06/03/22 05:46	1
13C3 HFPO-DA	90		25 - 150				06/01/22 19:03	06/03/22 05:46	1
18O2 PFHxS	85		25 - 150				06/01/22 19:03	06/03/22 05:46	1
13C3 PFBS	82		25 - 150				06/01/22 19:03	06/03/22 05:46	1
13C2 PFDoA	96		25 - 150				06/01/22 19:03	06/03/22 05:46	1
13C2 PFTeDA	90		25 - 150				06/01/22 19:03	06/03/22 05:46	1
13C5 PFNA	93		25 - 150				06/01/22 19:03	06/03/22 05:46	1
13C4 PFOA	93		25 - 150				06/01/22 19:03	06/03/22 05:46	1
13C2 PFUnA	96		25 - 150				06/01/22 19:03	06/03/22 05:46	1
13C4 PFHpA	94		25 - 150				06/01/22 19:03	06/03/22 05:46	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	10.8		0.1	0.1	%			05/27/22 10:41	1
Percent Solids	89.2		0.1	0.1	%			05/27/22 10:41	1

Client Sample ID: FP-P5:0.5

Lab Sample ID: 320-88345-22

Date Collected: 05/24/22 08:20

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 90.1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.049	J	0.20	0.032	ug/Kg	☆	06/01/22 19:03	06/03/22 05:56	1
Perfluoroheptanoic acid (PFHpA)	0.045	J	0.20	0.039	ug/Kg	☆	06/01/22 19:03	06/03/22 05:56	1
Perfluorooctanoic acid (PFOA)	0.17	J	0.20	0.054	ug/Kg	☆	06/01/22 19:03	06/03/22 05:56	1
Perfluorononanoic acid (PFNA)	0.31		0.20	0.022	ug/Kg	☆	06/01/22 19:03	06/03/22 05:56	1
Perfluorodecanoic acid (PFDA)	0.076	J	0.20	0.049	ug/Kg	☆	06/01/22 19:03	06/03/22 05:56	1
Perfluoroundecanoic acid (PFUnA)	0.14	J	0.20	0.043	ug/Kg	☆	06/01/22 19:03	06/03/22 05:56	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.030	ug/Kg	☆	06/01/22 19:03	06/03/22 05:56	1
Perfluorotridecanoic acid (PFTriA)	0.071	J	0.20	0.021	ug/Kg	☆	06/01/22 19:03	06/03/22 05:56	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.038	ug/Kg	☆	06/01/22 19:03	06/03/22 05:56	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.039	ug/Kg	☆	06/01/22 19:03	06/03/22 05:56	1
Perfluorohexanesulfonic acid (PFHxS)	0.36		0.20	0.029	ug/Kg	☆	06/01/22 19:03	06/03/22 05:56	1
Perfluorooctanesulfonic acid (PFOS)	5.3		0.20	0.044	ug/Kg	☆	06/01/22 19:03	06/03/22 05:56	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P5:0.5

Lab Sample ID: 320-88345-22

Date Collected: 05/24/22 08:20

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 90.1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.20	0.023	ug/Kg	☆	06/01/22 19:03	06/03/22 05:56	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.20	0.049	ug/Kg	☆	06/01/22 19:03	06/03/22 05:56	1
F-53B Major	ND		0.20	0.036	ug/Kg	☆	06/01/22 19:03	06/03/22 05:56	1
HFPO-DA (GenX)	ND		0.20	0.042	ug/Kg	☆	06/01/22 19:03	06/03/22 05:56	1
F-53B Minor	ND		0.20	0.032	ug/Kg	☆	06/01/22 19:03	06/03/22 05:56	1
DONA	ND		0.20	0.040	ug/Kg	☆	06/01/22 19:03	06/03/22 05:56	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	94		25 - 150				06/01/22 19:03	06/03/22 05:56	1
13C2 PFDA	106		25 - 150				06/01/22 19:03	06/03/22 05:56	1
13C4 PFOS	87		25 - 150				06/01/22 19:03	06/03/22 05:56	1
d3-NMeFOSAA	108		25 - 150				06/01/22 19:03	06/03/22 05:56	1
d5-NEtFOSAA	115		25 - 150				06/01/22 19:03	06/03/22 05:56	1
13C3 HFPO-DA	97		25 - 150				06/01/22 19:03	06/03/22 05:56	1
18O2 PFHxS	87		25 - 150				06/01/22 19:03	06/03/22 05:56	1
13C3 PFBS	90		25 - 150				06/01/22 19:03	06/03/22 05:56	1
13C2 PFDoA	101		25 - 150				06/01/22 19:03	06/03/22 05:56	1
13C2 PFTeDA	95		25 - 150				06/01/22 19:03	06/03/22 05:56	1
13C5 PFNA	101		25 - 150				06/01/22 19:03	06/03/22 05:56	1
13C4 PFOA	96		25 - 150				06/01/22 19:03	06/03/22 05:56	1
13C2 PFUnA	94		25 - 150				06/01/22 19:03	06/03/22 05:56	1
13C4 PFHpA	106		25 - 150				06/01/22 19:03	06/03/22 05:56	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	9.9		0.1	0.1	%			05/27/22 10:41	1
Percent Solids	90.1		0.1	0.1	%			05/27/22 10:41	1

Client Sample ID: FP-P5:7.5

Lab Sample ID: 320-88345-23

Date Collected: 05/24/22 08:25

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 83.8

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.29		0.23	0.036	ug/Kg	☆	06/01/22 19:03	06/03/22 06:06	1
Perfluoroheptanoic acid (PFHpA)	0.22	J	0.23	0.044	ug/Kg	☆	06/01/22 19:03	06/03/22 06:06	1
Perfluorooctanoic acid (PFOA)	1.2		0.23	0.061	ug/Kg	☆	06/01/22 19:03	06/03/22 06:06	1
Perfluorononanoic acid (PFNA)	ND		0.23	0.025	ug/Kg	☆	06/01/22 19:03	06/03/22 06:06	1
Perfluorodecanoic acid (PFDA)	ND		0.23	0.055	ug/Kg	☆	06/01/22 19:03	06/03/22 06:06	1
Perfluoroundecanoic acid (PFUnA)	ND		0.23	0.048	ug/Kg	☆	06/01/22 19:03	06/03/22 06:06	1
Perfluorododecanoic acid (PFDoA)	ND		0.23	0.035	ug/Kg	☆	06/01/22 19:03	06/03/22 06:06	1
Perfluorotridecanoic acid (PFTriA)	ND		0.23	0.024	ug/Kg	☆	06/01/22 19:03	06/03/22 06:06	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.23	0.043	ug/Kg	☆	06/01/22 19:03	06/03/22 06:06	1
Perfluorobutanesulfonic acid (PFBS)	0.14	J	0.23	0.044	ug/Kg	☆	06/01/22 19:03	06/03/22 06:06	1
Perfluorohexanesulfonic acid (PFHxS)	2.4		0.23	0.033	ug/Kg	☆	06/01/22 19:03	06/03/22 06:06	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.23	0.050	ug/Kg	☆	06/01/22 19:03	06/03/22 06:06	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.23	0.027	ug/Kg	☆	06/01/22 19:03	06/03/22 06:06	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P5:7.5

Lab Sample ID: 320-88345-23

Date Collected: 05/24/22 08:25

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 83.8

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.23	0.055	ug/Kg	☆	06/01/22 19:03	06/03/22 06:06	1
F-53B Major	ND		0.23	0.040	ug/Kg	☆	06/01/22 19:03	06/03/22 06:06	1
HFPO-DA (GenX)	ND		0.23	0.047	ug/Kg	☆	06/01/22 19:03	06/03/22 06:06	1
F-53B Minor	ND		0.23	0.036	ug/Kg	☆	06/01/22 19:03	06/03/22 06:06	1
DONA	ND		0.23	0.045	ug/Kg	☆	06/01/22 19:03	06/03/22 06:06	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	87		25 - 150				06/01/22 19:03	06/03/22 06:06	1
13C2 PFDA	91		25 - 150				06/01/22 19:03	06/03/22 06:06	1
13C4 PFOS	76		25 - 150				06/01/22 19:03	06/03/22 06:06	1
d3-NMeFOSAA	100		25 - 150				06/01/22 19:03	06/03/22 06:06	1
d5-NEtFOSAA	106		25 - 150				06/01/22 19:03	06/03/22 06:06	1
13C3 HFPO-DA	85		25 - 150				06/01/22 19:03	06/03/22 06:06	1
18O2 PFHxS	81		25 - 150				06/01/22 19:03	06/03/22 06:06	1
13C3 PFBS	81		25 - 150				06/01/22 19:03	06/03/22 06:06	1
13C2 PFDoA	95		25 - 150				06/01/22 19:03	06/03/22 06:06	1
13C2 PFTeDA	86		25 - 150				06/01/22 19:03	06/03/22 06:06	1
13C5 PFNA	91		25 - 150				06/01/22 19:03	06/03/22 06:06	1
13C4 PFOA	93		25 - 150				06/01/22 19:03	06/03/22 06:06	1
13C2 PFUnA	89		25 - 150				06/01/22 19:03	06/03/22 06:06	1
13C4 PFHpA	84		25 - 150				06/01/22 19:03	06/03/22 06:06	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	16.2		0.1	0.1	%			05/27/22 10:41	1
Percent Solids	83.8		0.1	0.1	%			05/27/22 10:41	1

Client Sample ID: FP-P6:0.5

Lab Sample ID: 320-88345-25

Date Collected: 05/24/22 09:20

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 89.0

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.058	J	0.22	0.033	ug/Kg	☆	06/01/22 19:03	06/03/22 06:47	1
Perfluoroheptanoic acid (PFHpA)	0.055	J	0.22	0.041	ug/Kg	☆	06/01/22 19:03	06/03/22 06:47	1
Perfluorooctanoic acid (PFOA)	ND		0.22	0.057	ug/Kg	☆	06/01/22 19:03	06/03/22 06:47	1
Perfluorononanoic acid (PFNA)	0.35		0.22	0.024	ug/Kg	☆	06/01/22 19:03	06/03/22 06:47	1
Perfluorodecanoic acid (PFDA)	0.11	J	0.22	0.052	ug/Kg	☆	06/01/22 19:03	06/03/22 06:47	1
Perfluoroundecanoic acid (PFUnA)	1.4		0.22	0.045	ug/Kg	☆	06/01/22 19:03	06/03/22 06:47	1
Perfluorododecanoic acid (PFDoA)	0.035	J	0.22	0.032	ug/Kg	☆	06/01/22 19:03	06/03/22 06:47	1
Perfluorotridecanoic acid (PFTriA)	0.51		0.22	0.023	ug/Kg	☆	06/01/22 19:03	06/03/22 06:47	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.040	ug/Kg	☆	06/01/22 19:03	06/03/22 06:47	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.041	ug/Kg	☆	06/01/22 19:03	06/03/22 06:47	1
Perfluorohexanesulfonic acid (PFHxS)	0.27		0.22	0.031	ug/Kg	☆	06/01/22 19:03	06/03/22 06:47	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.22	0.025	ug/Kg	☆	06/01/22 19:03	06/03/22 06:47	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.22	0.052	ug/Kg	☆	06/01/22 19:03	06/03/22 06:47	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P6:0.5

Lab Sample ID: 320-88345-25

Date Collected: 05/24/22 09:20

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 89.0

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
F-53B Major	ND		0.22	0.038	ug/Kg	☆	06/01/22 19:03	06/03/22 06:47	1
HFPO-DA (GenX)	ND		0.22	0.044	ug/Kg	☆	06/01/22 19:03	06/03/22 06:47	1
F-53B Minor	ND		0.22	0.033	ug/Kg	☆	06/01/22 19:03	06/03/22 06:47	1
DONA	ND		0.22	0.042	ug/Kg	☆	06/01/22 19:03	06/03/22 06:47	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	89		25 - 150	06/01/22 19:03	06/03/22 06:47	1
13C2 PFDA	90		25 - 150	06/01/22 19:03	06/03/22 06:47	1
13C4 PFOS	73		25 - 150	06/01/22 19:03	06/03/22 06:47	1
d3-NMeFOSAA	95		25 - 150	06/01/22 19:03	06/03/22 06:47	1
d5-NEtFOSAA	105		25 - 150	06/01/22 19:03	06/03/22 06:47	1
13C3 HFPO-DA	79		25 - 150	06/01/22 19:03	06/03/22 06:47	1
18O2 PFHxS	86		25 - 150	06/01/22 19:03	06/03/22 06:47	1
13C3 PFBS	80		25 - 150	06/01/22 19:03	06/03/22 06:47	1
13C2 PFDoA	95		25 - 150	06/01/22 19:03	06/03/22 06:47	1
13C2 PFTeDA	84		25 - 150	06/01/22 19:03	06/03/22 06:47	1
13C5 PFNA	84		25 - 150	06/01/22 19:03	06/03/22 06:47	1
13C4 PFOA	89		25 - 150	06/01/22 19:03	06/03/22 06:47	1
13C2 PFUnA	94		25 - 150	06/01/22 19:03	06/03/22 06:47	1
13C4 PFHpA	95		25 - 150	06/01/22 19:03	06/03/22 06:47	1

Method: 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	28		1.1	0.23	ug/Kg	☼	06/01/22 19:03	06/03/22 19:12	5
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOS	80		25 - 150				06/01/22 19:03	06/03/22 19:12	5

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	11.0		0.1	0.1	%			05/27/22 10:41	1
Percent Solids	89.0		0.1	0.1	%			05/27/22 10:41	1

Client Sample ID: FP-P6:3.4

Lab Sample ID: 320-88345-26

Date Collected: 05/24/22 09:25

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 72.7

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.10	J	0.25	0.038	ug/Kg	☆	06/01/22 19:03	06/03/22 06:57	1
Perfluoroheptanoic acid (PFHpA)	0.087	J	0.25	0.047	ug/Kg	☆	06/01/22 19:03	06/03/22 06:57	1
Perfluorooctanoic acid (PFOA)	0.17	J	0.25	0.065	ug/Kg	☆	06/01/22 19:03	06/03/22 06:57	1
Perfluorononanoic acid (PFNA)	0.032	J	0.25	0.027	ug/Kg	☆	06/01/22 19:03	06/03/22 06:57	1
Perfluorodecanoic acid (PFDA)	ND		0.25	0.059	ug/Kg	☆	06/01/22 19:03	06/03/22 06:57	1
Perfluoroundecanoic acid (PFUnA)	ND		0.25	0.052	ug/Kg	☆	06/01/22 19:03	06/03/22 06:57	1
Perfluorododecanoic acid (PFDoA)	ND		0.25	0.037	ug/Kg	☆	06/01/22 19:03	06/03/22 06:57	1
Perfluorotridecanoic acid (PFTriA)	ND		0.25	0.026	ug/Kg	☆	06/01/22 19:03	06/03/22 06:57	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.25	0.045	ug/Kg	☆	06/01/22 19:03	06/03/22 06:57	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.25	0.047	ug/Kg	☆	06/01/22 19:03	06/03/22 06:57	1
Perfluorohexanesulfonic acid (PFHxS)	0.58		0.25	0.036	ug/Kg	☆	06/01/22 19:03	06/03/22 06:57	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P6:3.4

Lab Sample ID: 320-88345-26

Date Collected: 05/24/22 09:25

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 72.7

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.89		0.25	0.053	ug/Kg	☆	06/01/22 19:03	06/03/22 06:57	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.25	0.028	ug/Kg	☆	06/01/22 19:03	06/03/22 06:57	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.25	0.059	ug/Kg	☆	06/01/22 19:03	06/03/22 06:57	1
F-53B Major	ND		0.25	0.043	ug/Kg	☆	06/01/22 19:03	06/03/22 06:57	1
HFPO-DA (GenX)	ND		0.25	0.050	ug/Kg	☆	06/01/22 19:03	06/03/22 06:57	1
F-53B Minor	ND		0.25	0.038	ug/Kg	☆	06/01/22 19:03	06/03/22 06:57	1
DONA	ND		0.25	0.048	ug/Kg	☆	06/01/22 19:03	06/03/22 06:57	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	90		25 - 150				06/01/22 19:03	06/03/22 06:57	1
13C2 PFDA	90		25 - 150				06/01/22 19:03	06/03/22 06:57	1
13C4 PFOS	84		25 - 150				06/01/22 19:03	06/03/22 06:57	1
d3-NMeFOSAA	99		25 - 150				06/01/22 19:03	06/03/22 06:57	1
d5-NEtFOSAA	111		25 - 150				06/01/22 19:03	06/03/22 06:57	1
13C3 HFPO-DA	89		25 - 150				06/01/22 19:03	06/03/22 06:57	1
18O2 PFHxS	87		25 - 150				06/01/22 19:03	06/03/22 06:57	1
13C3 PFBS	84		25 - 150				06/01/22 19:03	06/03/22 06:57	1
13C2 PFDoA	95		25 - 150				06/01/22 19:03	06/03/22 06:57	1
13C2 PFTeDA	91		25 - 150				06/01/22 19:03	06/03/22 06:57	1
13C5 PFNA	93		25 - 150				06/01/22 19:03	06/03/22 06:57	1
13C4 PFOA	91		25 - 150				06/01/22 19:03	06/03/22 06:57	1
13C2 PFUnA	92		25 - 150				06/01/22 19:03	06/03/22 06:57	1
13C4 PFHpA	96		25 - 150				06/01/22 19:03	06/03/22 06:57	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	27.3		0.1	0.1	%			05/27/22 10:41	1
Percent Solids	72.7		0.1	0.1	%			05/27/22 10:41	1

Client Sample ID: FP-P7:0.5

Lab Sample ID: 320-88345-28

Date Collected: 05/24/22 10:15

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 90.9

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.63	F1	0.20	0.032	ug/Kg	☆	06/01/22 19:07	06/02/22 23:42	1
Perfluoroheptanoic acid (PFHpA)	0.14	J	0.20	0.039	ug/Kg	☆	06/01/22 19:07	06/02/22 23:42	1
Perfluorooctanoic acid (PFOA)	1.5	F1	0.20	0.054	ug/Kg	☆	06/01/22 19:07	06/02/22 23:42	1
Perfluorononanoic acid (PFNA)	6.7	F1	0.20	0.022	ug/Kg	☆	06/01/22 19:07	06/02/22 23:42	1
Perfluorodecanoic acid (PFDA)	0.83		0.20	0.049	ug/Kg	☆	06/01/22 19:07	06/02/22 23:42	1
Perfluorododecanoic acid (PFDoA)	0.48		0.20	0.031	ug/Kg	☆	06/01/22 19:07	06/02/22 23:42	1
Perfluorotridecanoic acid (PFTriA)	11		0.20	0.021	ug/Kg	☆	06/01/22 19:07	06/02/22 23:42	1
Perfluorotetradecanoic acid (PFTeA)	0.32		0.20	0.038	ug/Kg	☆	06/01/22 19:07	06/02/22 23:42	1
Perfluorobutanesulfonic acid (PFBS)	0.26		0.20	0.039	ug/Kg	☆	06/01/22 19:07	06/02/22 23:42	1
Perfluorohexanesulfonic acid (PFHxS)	10		0.20	0.030	ug/Kg	☆	06/01/22 19:07	06/02/22 23:42	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P7:0.5

Lab Sample ID: 320-88345-28

Date Collected: 05/24/22 10:15

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 90.9

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-methylperfluorooctanesulfona midoacetic acid (NMeFOSAA)	0.13	J I	0.20	0.023	ug/Kg	☆	06/01/22 19:07	06/02/22 23:42	1
N-ethylperfluorooctanesulfonami doacetic acid (NEtFOSAA)	0.32		0.20	0.049	ug/Kg	☆	06/01/22 19:07	06/02/22 23:42	1
F-53B Major	ND	F1	0.20	0.036	ug/Kg	☆	06/01/22 19:07	06/02/22 23:42	1
HFPO-DA (GenX)	ND		0.20	0.042	ug/Kg	☆	06/01/22 19:07	06/02/22 23:42	1
F-53B Minor	ND	F1	0.20	0.032	ug/Kg	☆	06/01/22 19:07	06/02/22 23:42	1
DONA	ND	F1	0.20	0.040	ug/Kg	☆	06/01/22 19:07	06/02/22 23:42	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	91		25 - 150				06/01/22 19:07	06/02/22 23:42	1
13C2 PFDA	102		25 - 150				06/01/22 19:07	06/02/22 23:42	1
13C4 PFOS	50		25 - 150				06/01/22 19:07	06/02/22 23:42	1
d3-NMeFOSAA	102		25 - 150				06/01/22 19:07	06/02/22 23:42	1
d5-NEtFOSAA	109		25 - 150				06/01/22 19:07	06/02/22 23:42	1
13C3 HFPO-DA	96		25 - 150				06/01/22 19:07	06/02/22 23:42	1
18O2 PFHxS	96		25 - 150				06/01/22 19:07	06/02/22 23:42	1
13C3 PFBS	93		25 - 150				06/01/22 19:07	06/02/22 23:42	1
13C2 PFDoA	116		25 - 150				06/01/22 19:07	06/02/22 23:42	1
13C2 PFTeDA	103		25 - 150				06/01/22 19:07	06/02/22 23:42	1
13C5 PFNA	54		25 - 150				06/01/22 19:07	06/02/22 23:42	1
13C4 PFOA	100		25 - 150				06/01/22 19:07	06/02/22 23:42	1
13C2 PFUnA	94		25 - 150				06/01/22 19:07	06/02/22 23:42	1
13C4 PFHpA	106		25 - 150				06/01/22 19:07	06/02/22 23:42	1

Method: 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroundecanoic acid (PFUnA)	29		10	2.1	ug/Kg	☆	06/01/22 19:07	06/04/22 00:21	50
Perfluorooctanesulfonic acid (PFOS)	820	B	10	2.2	ug/Kg	☆	06/01/22 19:07	06/04/22 00:21	50
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOS	80		25 - 150				06/01/22 19:07	06/04/22 00:21	50
13C2 PFUnA	80		25 - 150				06/01/22 19:07	06/04/22 00:21	50

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	9.1		0.1	0.1	%			05/27/22 10:41	1
Percent Solids	90.9		0.1	0.1	%			05/27/22 10:41	1

Client Sample ID: FP-P7:7.0

Lab Sample ID: 320-88345-29

Date Collected: 05/24/22 10:20

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 88.4

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.63		0.22	0.034	ug/Kg	☆	06/01/22 19:07	06/03/22 00:12	1
Perfluoroheptanoic acid (PFHpA)	0.11	J	0.22	0.041	ug/Kg	☆	06/01/22 19:07	06/03/22 00:12	1
Perfluorooctanoic acid (PFOA)	0.82		0.22	0.058	ug/Kg	☆	06/01/22 19:07	06/03/22 00:12	1
Perfluorononanoic acid (PFNA)	3.8		0.22	0.024	ug/Kg	☆	06/01/22 19:07	06/03/22 00:12	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.052	ug/Kg	☆	06/01/22 19:07	06/03/22 00:12	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.046	ug/Kg	☆	06/01/22 19:07	06/03/22 00:12	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P7:7.0

Lab Sample ID: 320-88345-29

Date Collected: 05/24/22 10:20

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 88.4

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.033	ug/Kg	☆	06/01/22 19:07	06/03/22 00:12	1
Perfluorotridecanoic acid (PFTrIA)	ND		0.22	0.023	ug/Kg	☆	06/01/22 19:07	06/03/22 00:12	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.040	ug/Kg	☆	06/01/22 19:07	06/03/22 00:12	1
Perfluorobutanesulfonic acid (PFBS)	0.18	J	0.22	0.041	ug/Kg	☆	06/01/22 19:07	06/03/22 00:12	1
Perfluorohexanesulfonic acid (PFHxS)	7.1		0.22	0.031	ug/Kg	☆	06/01/22 19:07	06/03/22 00:12	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.22	0.025	ug/Kg	☆	06/01/22 19:07	06/03/22 00:12	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.22	0.052	ug/Kg	☆	06/01/22 19:07	06/03/22 00:12	1
F-53B Major	ND		0.22	0.038	ug/Kg	☆	06/01/22 19:07	06/03/22 00:12	1
HFPO-DA (GenX)	ND		0.22	0.045	ug/Kg	☆	06/01/22 19:07	06/03/22 00:12	1
F-53B Minor	ND		0.22	0.034	ug/Kg	☆	06/01/22 19:07	06/03/22 00:12	1
DONA	ND		0.22	0.042	ug/Kg	☆	06/01/22 19:07	06/03/22 00:12	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	101		25 - 150				06/01/22 19:07	06/03/22 00:12	1
13C2 PFDA	93		25 - 150				06/01/22 19:07	06/03/22 00:12	1
13C4 PFOS	61		25 - 150				06/01/22 19:07	06/03/22 00:12	1
d3-NMeFOSAA	99		25 - 150				06/01/22 19:07	06/03/22 00:12	1
d5-NEtFOSAA	107		25 - 150				06/01/22 19:07	06/03/22 00:12	1
13C3 HFPO-DA	84		25 - 150				06/01/22 19:07	06/03/22 00:12	1
18O2 PFHxS	79		25 - 150				06/01/22 19:07	06/03/22 00:12	1
13C3 PFBS	80		25 - 150				06/01/22 19:07	06/03/22 00:12	1
13C2 PFDoA	91		25 - 150				06/01/22 19:07	06/03/22 00:12	1
13C2 PFTeDA	72		25 - 150				06/01/22 19:07	06/03/22 00:12	1
13C5 PFNA	74		25 - 150				06/01/22 19:07	06/03/22 00:12	1
13C4 PFOA	91		25 - 150				06/01/22 19:07	06/03/22 00:12	1
13C2 PFUnA	89		25 - 150				06/01/22 19:07	06/03/22 00:12	1
13C4 PFHpA	94		25 - 150				06/01/22 19:07	06/03/22 00:12	1

Method: 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	270	B	4.3	0.93	ug/Kg	☆	06/01/22 19:07	06/04/22 00:00	20
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOS	99		25 - 150				06/01/22 19:07	06/04/22 00:00	20

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	11.6		0.1	0.1	%			05/27/22 10:41	1
Percent Solids	88.4		0.1	0.1	%			05/27/22 10:41	1

Client Sample ID: FP-P100:0.5

Lab Sample ID: 320-88345-31

Date Collected: 05/24/22 16:00

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 88.9

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.49		0.20	0.031	ug/Kg	☆	06/01/22 19:07	06/03/22 00:32	1
Perfluoroheptanoic acid (PFHpA)	0.11	J	0.20	0.038	ug/Kg	☆	06/01/22 19:07	06/03/22 00:32	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P100:0.5

Lab Sample ID: 320-88345-31

Date Collected: 05/24/22 16:00

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 88.9

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	1.4		0.20	0.053	ug/Kg	☆	06/01/22 19:07	06/03/22 00:32	1
Perfluorononanoic acid (PFNA)	6.5		0.20	0.022	ug/Kg	☆	06/01/22 19:07	06/03/22 00:32	1
Perfluorodecanoic acid (PFDA)	0.73		0.20	0.048	ug/Kg	☆	06/01/22 19:07	06/03/22 00:32	1
Perfluorododecanoic acid (PFDoA)	0.42		0.20	0.030	ug/Kg	☆	06/01/22 19:07	06/03/22 00:32	1
Perfluorotridecanoic acid (PFTriA)	7.7		0.20	0.021	ug/Kg	☆	06/01/22 19:07	06/03/22 00:32	1
Perfluorotetradecanoic acid (PFTeA)	0.19	J	0.20	0.037	ug/Kg	☆	06/01/22 19:07	06/03/22 00:32	1
Perfluorobutanesulfonic acid (PFBS)	0.20		0.20	0.038	ug/Kg	☆	06/01/22 19:07	06/03/22 00:32	1
Perfluorohexanesulfonic acid (PFHxS)	9.0		0.20	0.029	ug/Kg	☆	06/01/22 19:07	06/03/22 00:32	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.093	J I	0.20	0.023	ug/Kg	☆	06/01/22 19:07	06/03/22 00:32	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.33		0.20	0.048	ug/Kg	☆	06/01/22 19:07	06/03/22 00:32	1
F-53B Major	ND		0.20	0.035	ug/Kg	☆	06/01/22 19:07	06/03/22 00:32	1
HFPO-DA (GenX)	ND		0.20	0.041	ug/Kg	☆	06/01/22 19:07	06/03/22 00:32	1
F-53B Minor	ND		0.20	0.031	ug/Kg	☆	06/01/22 19:07	06/03/22 00:32	1
DONA	ND		0.20	0.039	ug/Kg	☆	06/01/22 19:07	06/03/22 00:32	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	106		25 - 150	06/01/22 19:07	06/03/22 00:32	1
13C2 PFDA	118		25 - 150	06/01/22 19:07	06/03/22 00:32	1
13C4 PFOS	56		25 - 150	06/01/22 19:07	06/03/22 00:32	1
d3-NMeFOSAA	115		25 - 150	06/01/22 19:07	06/03/22 00:32	1
d5-NEtFOSAA	114		25 - 150	06/01/22 19:07	06/03/22 00:32	1
13C3 HFPO-DA	98		25 - 150	06/01/22 19:07	06/03/22 00:32	1
18O2 PFHxS	103		25 - 150	06/01/22 19:07	06/03/22 00:32	1
13C3 PFBS	98		25 - 150	06/01/22 19:07	06/03/22 00:32	1
13C2 PFDoA	112		25 - 150	06/01/22 19:07	06/03/22 00:32	1
13C2 PFTeDA	106		25 - 150	06/01/22 19:07	06/03/22 00:32	1
13C5 PFNA	65		25 - 150	06/01/22 19:07	06/03/22 00:32	1
13C4 PFOA	100		25 - 150	06/01/22 19:07	06/03/22 00:32	1
13C2 PFUnA	101		25 - 150	06/01/22 19:07	06/03/22 00:32	1
13C4 PFHpA	115		25 - 150	06/01/22 19:07	06/03/22 00:32	1

Method: 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroundecanoic acid (PFUnA)	23		10	2.1	ug/Kg	☼	06/01/22 19:07	06/04/22 00:51	50
Perfluorooctanesulfonic acid (PFOS)	720	B	10	2.2	ug/Kg	☼	06/01/22 19:07	06/04/22 00:51	50
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOS	92		25 - 150				06/01/22 19:07	06/04/22 00:51	50
13C2 PFUnA	102		25 - 150				06/01/22 19:07	06/04/22 00:51	50

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	11.1		0.1	0.1	%			05/27/22 10:41	1
Percent Solids	88.9		0.1	0.1	%			05/27/22 10:41	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P8:1.5

Lab Sample ID: 320-88345-32

Date Collected: 05/24/22 10:50

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 87.9

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.14	J	0.21	0.033	ug/Kg	☆	06/01/22 19:07	06/03/22 00:43	1
Perfluoroheptanoic acid (PFHpA)	0.075	J	0.21	0.041	ug/Kg	☆	06/01/22 19:07	06/03/22 00:43	1
Perfluorooctanoic acid (PFOA)	0.13	J	0.21	0.057	ug/Kg	☆	06/01/22 19:07	06/03/22 00:43	1
Perfluorononanoic acid (PFNA)	0.78		0.21	0.024	ug/Kg	☆	06/01/22 19:07	06/03/22 00:43	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.051	ug/Kg	☆	06/01/22 19:07	06/03/22 00:43	1
Perfluoroundecanoic acid (PFUnA)	0.13	J	0.21	0.045	ug/Kg	☆	06/01/22 19:07	06/03/22 00:43	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.032	ug/Kg	☆	06/01/22 19:07	06/03/22 00:43	1
Perfluorotridecanoic acid (PFTriA)	0.14	J	0.21	0.022	ug/Kg	☆	06/01/22 19:07	06/03/22 00:43	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.040	ug/Kg	☆	06/01/22 19:07	06/03/22 00:43	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.041	ug/Kg	☆	06/01/22 19:07	06/03/22 00:43	1
Perfluorohexanesulfonic acid (PFHxS)	0.18	J	0.21	0.031	ug/Kg	☆	06/01/22 19:07	06/03/22 00:43	1
Perfluorooctanesulfonic acid (PFOS)	14	B	0.21	0.046	ug/Kg	☆	06/01/22 19:07	06/03/22 00:43	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.21	0.025	ug/Kg	☆	06/01/22 19:07	06/03/22 00:43	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.21	0.051	ug/Kg	☆	06/01/22 19:07	06/03/22 00:43	1
F-53B Major	ND		0.21	0.037	ug/Kg	☆	06/01/22 19:07	06/03/22 00:43	1
HFPO-DA (GenX)	ND		0.21	0.044	ug/Kg	☆	06/01/22 19:07	06/03/22 00:43	1
F-53B Minor	ND		0.21	0.033	ug/Kg	☆	06/01/22 19:07	06/03/22 00:43	1
DONA	ND		0.21	0.042	ug/Kg	☆	06/01/22 19:07	06/03/22 00:43	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	107		25 - 150	06/01/22 19:07	06/03/22 00:43	1
13C2 PFDA	109		25 - 150	06/01/22 19:07	06/03/22 00:43	1
13C4 PFOS	94		25 - 150	06/01/22 19:07	06/03/22 00:43	1
d3-NMeFOSAA	114		25 - 150	06/01/22 19:07	06/03/22 00:43	1
d5-NEtFOSAA	118		25 - 150	06/01/22 19:07	06/03/22 00:43	1
13C3 HFPO-DA	108		25 - 150	06/01/22 19:07	06/03/22 00:43	1
18O2 PFHxS	93		25 - 150	06/01/22 19:07	06/03/22 00:43	1
13C3 PFBS	95		25 - 150	06/01/22 19:07	06/03/22 00:43	1
13C2 PFDoA	114		25 - 150	06/01/22 19:07	06/03/22 00:43	1
13C2 PFTeDA	109		25 - 150	06/01/22 19:07	06/03/22 00:43	1
13C5 PFNA	104		25 - 150	06/01/22 19:07	06/03/22 00:43	1
13C4 PFOA	103		25 - 150	06/01/22 19:07	06/03/22 00:43	1
13C2 PFUnA	103		25 - 150	06/01/22 19:07	06/03/22 00:43	1
13C4 PFHpA	107		25 - 150	06/01/22 19:07	06/03/22 00:43	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	12.1		0.1	0.1	%			05/27/22 10:41	1
Percent Solids	87.9		0.1	0.1	%			05/27/22 10:41	1

Client Sample ID: FP-P8:6.3

Lab Sample ID: 320-88345-33

Date Collected: 05/24/22 10:55

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 87.7

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.17	J	0.22	0.034	ug/Kg	☆	06/06/22 19:06	06/07/22 11:05	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P8:6.3

Lab Sample ID: 320-88345-33

Date Collected: 05/24/22 10:55

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 87.7

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.090	J	0.22	0.042	ug/Kg	☆	06/06/22 19:06	06/07/22 11:05	1
Perfluorooctanoic acid (PFOA)	0.31		0.22	0.058	ug/Kg	☆	06/06/22 19:06	06/07/22 11:05	1
Perfluorononanoic acid (PFNA)	0.049	J	0.22	0.024	ug/Kg	☆	06/06/22 19:06	06/07/22 11:05	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.053	ug/Kg	☆	06/06/22 19:06	06/07/22 11:05	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.046	ug/Kg	☆	06/06/22 19:06	06/07/22 11:05	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.033	ug/Kg	☆	06/06/22 19:06	06/07/22 11:05	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.023	ug/Kg	☆	06/06/22 19:06	06/07/22 11:05	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.041	ug/Kg	☆	06/06/22 19:06	06/07/22 11:05	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.042	ug/Kg	☆	06/06/22 19:06	06/07/22 11:05	1
Perfluorohexanesulfonic acid (PFHxS)	0.22		0.22	0.032	ug/Kg	☆	06/06/22 19:06	06/07/22 11:05	1
Perfluorooctanesulfonic acid (PFOS)	1.2		0.22	0.047	ug/Kg	☆	06/06/22 19:06	06/07/22 11:05	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.22	0.025	ug/Kg	☆	06/06/22 19:06	06/07/22 11:05	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.22	0.053	ug/Kg	☆	06/06/22 19:06	06/07/22 11:05	1
F-53B Major	ND		0.22	0.038	ug/Kg	☆	06/06/22 19:06	06/07/22 11:05	1
HFPO-DA (GenX)	ND		0.22	0.045	ug/Kg	☆	06/06/22 19:06	06/07/22 11:05	1
F-53B Minor	ND		0.22	0.034	ug/Kg	☆	06/06/22 19:06	06/07/22 11:05	1
DONA	ND		0.22	0.043	ug/Kg	☆	06/06/22 19:06	06/07/22 11:05	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	87		25 - 150	06/06/22 19:06	06/07/22 11:05	1
13C2 PFDA	82		25 - 150	06/06/22 19:06	06/07/22 11:05	1
13C4 PFOS	74		25 - 150	06/06/22 19:06	06/07/22 11:05	1
d3-NMeFOSAA	84		25 - 150	06/06/22 19:06	06/07/22 11:05	1
d5-NEtFOSAA	84		25 - 150	06/06/22 19:06	06/07/22 11:05	1
13C3 HFPO-DA	96		25 - 150	06/06/22 19:06	06/07/22 11:05	1
18O2 PFHxS	88		25 - 150	06/06/22 19:06	06/07/22 11:05	1
13C3 PFBS	84		25 - 150	06/06/22 19:06	06/07/22 11:05	1
13C2 PFDoA	82		25 - 150	06/06/22 19:06	06/07/22 11:05	1
13C2 PFTeDA	67		25 - 150	06/06/22 19:06	06/07/22 11:05	1
13C5 PFNA	87		25 - 150	06/06/22 19:06	06/07/22 11:05	1
13C4 PFOA	87		25 - 150	06/06/22 19:06	06/07/22 11:05	1
13C2 PFUnA	80		25 - 150	06/06/22 19:06	06/07/22 11:05	1
13C4 PFHpA	89		25 - 150	06/06/22 19:06	06/07/22 11:05	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	12.3		0.1	0.1	%			05/27/22 12:40	1
Percent Solids	87.7		0.1	0.1	%			05/27/22 12:40	1

Client Sample ID: FP-P101:1.5

Lab Sample ID: 320-88345-35

Date Collected: 05/24/22 16:15

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 87.4

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.21		0.21	0.032	ug/Kg	☆	06/01/22 19:07	06/03/22 01:33	1
Perfluoroheptanoic acid (PFHpA)	0.093	J	0.21	0.039	ug/Kg	☆	06/01/22 19:07	06/03/22 01:33	1
Perfluorooctanoic acid (PFOA)	0.19	J	0.21	0.055	ug/Kg	☆	06/01/22 19:07	06/03/22 01:33	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P101:1.5

Lab Sample ID: 320-88345-35

Date Collected: 05/24/22 16:15

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 87.4

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	1.6		0.21	0.023	ug/Kg	☆	06/01/22 19:07	06/03/22 01:33	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.050	ug/Kg	☆	06/01/22 19:07	06/03/22 01:33	1
Perfluoroundecanoic acid (PFUnA)	0.13	J	0.21	0.044	ug/Kg	☆	06/01/22 19:07	06/03/22 01:33	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.031	ug/Kg	☆	06/01/22 19:07	06/03/22 01:33	1
Perfluorotridecanoic acid (PFTriA)	0.14	J	0.21	0.022	ug/Kg	☆	06/01/22 19:07	06/03/22 01:33	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.038	ug/Kg	☆	06/01/22 19:07	06/03/22 01:33	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.039	ug/Kg	☆	06/01/22 19:07	06/03/22 01:33	1
Perfluorohexanesulfonic acid (PFHxS)	0.39		0.21	0.030	ug/Kg	☆	06/01/22 19:07	06/03/22 01:33	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.21	0.024	ug/Kg	☆	06/01/22 19:07	06/03/22 01:33	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.21	0.050	ug/Kg	☆	06/01/22 19:07	06/03/22 01:33	1
F-53B Major	ND		0.21	0.036	ug/Kg	☆	06/01/22 19:07	06/03/22 01:33	1
HFPO-DA (GenX)	ND		0.21	0.043	ug/Kg	☆	06/01/22 19:07	06/03/22 01:33	1
F-53B Minor	ND		0.21	0.032	ug/Kg	☆	06/01/22 19:07	06/03/22 01:33	1
DONA	ND		0.21	0.040	ug/Kg	☆	06/01/22 19:07	06/03/22 01:33	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	88		25 - 150	06/01/22 19:07	06/03/22 01:33	1
13C2 PFDA	96		25 - 150	06/01/22 19:07	06/03/22 01:33	1
13C4 PFOS	81		25 - 150	06/01/22 19:07	06/03/22 01:33	1
d3-NMeFOSAA	94		25 - 150	06/01/22 19:07	06/03/22 01:33	1
d5-NEtFOSAA	94		25 - 150	06/01/22 19:07	06/03/22 01:33	1
13C3 HFPO-DA	89		25 - 150	06/01/22 19:07	06/03/22 01:33	1
18O2 PFHxS	87		25 - 150	06/01/22 19:07	06/03/22 01:33	1
13C3 PFBS	84		25 - 150	06/01/22 19:07	06/03/22 01:33	1
13C2 PFDoA	100		25 - 150	06/01/22 19:07	06/03/22 01:33	1
13C2 PFTeDA	94		25 - 150	06/01/22 19:07	06/03/22 01:33	1
13C5 PFNA	86		25 - 150	06/01/22 19:07	06/03/22 01:33	1
13C4 PFOA	96		25 - 150	06/01/22 19:07	06/03/22 01:33	1
13C2 PFUnA	91		25 - 150	06/01/22 19:07	06/03/22 01:33	1
13C4 PFHpA	92		25 - 150	06/01/22 19:07	06/03/22 01:33	1

Method: 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	25	B	1.0	0.22	ug/Kg	☼	06/01/22 19:07	06/05/22 22:00	5
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOS	80		25 - 150				06/01/22 19:07	06/05/22 22:00	5

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	12.6		0.1	0.1	%			05/27/22 12:40	1
Percent Solids	87.4		0.1	0.1	%			05/27/22 12:40	1

Eurofins Sacramento

Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-MW1:0.4

Lab Sample ID: 320-88345-36

Date Collected: 05/24/22 13:00

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 92.3

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.24		0.21	0.032	ug/Kg	✱	06/03/22 11:31	06/15/22 18:58	1
Perfluoroheptanoic acid (PFHpA)	0.053	J	0.21	0.039	ug/Kg	✱	06/03/22 11:31	06/15/22 18:58	1
Perfluorooctanoic acid (PFOA)	0.22		0.21	0.055	ug/Kg	✱	06/03/22 11:31	06/15/22 18:58	1
Perfluorononanoic acid (PFNA)	0.47		0.21	0.023	ug/Kg	✱	06/03/22 11:31	06/15/22 18:58	1
Perfluorodecanoic acid (PFDA)	0.29		0.21	0.049	ug/Kg	✱	06/03/22 11:31	06/15/22 18:58	1
Perfluoroundecanoic acid (PFUnA)	14		0.21	0.043	ug/Kg	✱	06/03/22 11:31	06/15/22 18:58	1
Perfluorododecanoic acid (PFDoA)	0.41		0.21	0.031	ug/Kg	✱	06/03/22 11:31	06/15/22 18:58	1
Perfluorotridecanoic acid (PFTriA)	11		0.21	0.022	ug/Kg	✱	06/03/22 11:31	06/15/22 18:58	1
Perfluorotetradecanoic acid (PFTeA)	0.19	J	0.21	0.038	ug/Kg	✱	06/03/22 11:31	06/15/22 18:58	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.039	ug/Kg	✱	06/03/22 11:31	06/15/22 18:58	1
Perfluorohexanesulfonic acid (PFHxS)	2.7		0.21	0.030	ug/Kg	✱	06/03/22 11:31	06/15/22 18:58	1
Perfluorooctanesulfonic acid (PFOS)	75	E	0.21	0.044	ug/Kg	✱	06/03/22 11:31	06/15/22 18:58	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.039	J	0.21	0.024	ug/Kg	✱	06/03/22 11:31	06/15/22 18:58	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.087	J	0.21	0.049	ug/Kg	✱	06/03/22 11:31	06/15/22 18:58	1
F-53B Major	ND		0.21	0.036	ug/Kg	✱	06/03/22 11:31	06/15/22 18:58	1
HFPO-DA (GenX)	ND		0.21	0.042	ug/Kg	✱	06/03/22 11:31	06/15/22 18:58	1
F-53B Minor	ND		0.21	0.032	ug/Kg	✱	06/03/22 11:31	06/15/22 18:58	1
DONA	ND		0.21	0.040	ug/Kg	✱	06/03/22 11:31	06/15/22 18:58	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	85		25 - 150	06/03/22 11:31	06/15/22 18:58	1
13C2 PFDA	70		25 - 150	06/03/22 11:31	06/15/22 18:58	1
13C4 PFOS	77		25 - 150	06/03/22 11:31	06/15/22 18:58	1
d3-NMeFOSAA	37		25 - 150	06/03/22 11:31	06/15/22 18:58	1
d5-NEtFOSAA	33		25 - 150	06/03/22 11:31	06/15/22 18:58	1
13C3 HFPO-DA	88		25 - 150	06/03/22 11:31	06/15/22 18:58	1
18O2 PFHxS	90		25 - 150	06/03/22 11:31	06/15/22 18:58	1
13C3 PFBS	86		25 - 150	06/03/22 11:31	06/15/22 18:58	1
13C2 PFDoA	41		25 - 150	06/03/22 11:31	06/15/22 18:58	1
13C2 PFTeDA	68		25 - 150	06/03/22 11:31	06/15/22 18:58	1
13C5 PFNA	87		25 - 150	06/03/22 11:31	06/15/22 18:58	1
13C4 PFOA	88		25 - 150	06/03/22 11:31	06/15/22 18:58	1
13C2 PFUnA	44		25 - 150	06/03/22 11:31	06/15/22 18:58	1
13C4 PFHpA	87		25 - 150	06/03/22 11:31	06/15/22 18:58	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	7.7		0.1	0.1	%			05/27/22 12:40	1
Percent Solids	92.3		0.1	0.1	%			05/27/22 12:40	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-MW1:7.6

Lab Sample ID: 320-88345-37

Date Collected: 05/24/22 13:05

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 86.8

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.34		0.22	0.034	ug/Kg	☆	06/01/22 19:07	06/03/22 01:43	1
Perfluoroheptanoic acid (PFHpA)	0.050	J	0.22	0.042	ug/Kg	☆	06/01/22 19:07	06/03/22 01:43	1
Perfluorooctanoic acid (PFOA)	0.26		0.22	0.058	ug/Kg	☆	06/01/22 19:07	06/03/22 01:43	1
Perfluorononanoic acid (PFNA)	4.9		0.22	0.024	ug/Kg	☆	06/01/22 19:07	06/03/22 01:43	1
Perfluorodecanoic acid (PFDA)	0.055	J	0.22	0.052	ug/Kg	☆	06/01/22 19:07	06/03/22 01:43	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.046	ug/Kg	☆	06/01/22 19:07	06/03/22 01:43	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.033	ug/Kg	☆	06/01/22 19:07	06/03/22 01:43	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.023	ug/Kg	☆	06/01/22 19:07	06/03/22 01:43	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.040	ug/Kg	☆	06/01/22 19:07	06/03/22 01:43	1
Perfluorobutanesulfonic acid (PFBS)	0.14	J	0.22	0.042	ug/Kg	☆	06/01/22 19:07	06/03/22 01:43	1
Perfluorohexanesulfonic acid (PFHxS)	7.5		0.22	0.032	ug/Kg	☆	06/01/22 19:07	06/03/22 01:43	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.22	0.025	ug/Kg	☆	06/01/22 19:07	06/03/22 01:43	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.22	0.052	ug/Kg	☆	06/01/22 19:07	06/03/22 01:43	1
F-53B Major	ND		0.22	0.038	ug/Kg	☆	06/01/22 19:07	06/03/22 01:43	1
HFPO-DA (GenX)	ND		0.22	0.045	ug/Kg	☆	06/01/22 19:07	06/03/22 01:43	1
F-53B Minor	ND		0.22	0.034	ug/Kg	☆	06/01/22 19:07	06/03/22 01:43	1
DONA	ND		0.22	0.043	ug/Kg	☆	06/01/22 19:07	06/03/22 01:43	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	94		25 - 150				06/01/22 19:07	06/03/22 01:43	1
13C2 PFDA	99		25 - 150				06/01/22 19:07	06/03/22 01:43	1
13C4 PFOS	69		25 - 150				06/01/22 19:07	06/03/22 01:43	1
d3-NMeFOSAA	109		25 - 150				06/01/22 19:07	06/03/22 01:43	1
d5-NEtFOSAA	110		25 - 150				06/01/22 19:07	06/03/22 01:43	1
13C3 HFPO-DA	93		25 - 150				06/01/22 19:07	06/03/22 01:43	1
18O2 PFHxS	88		25 - 150				06/01/22 19:07	06/03/22 01:43	1
13C3 PFBS	84		25 - 150				06/01/22 19:07	06/03/22 01:43	1
13C2 PFDoA	106		25 - 150				06/01/22 19:07	06/03/22 01:43	1
13C2 PFTeDA	97		25 - 150				06/01/22 19:07	06/03/22 01:43	1
13C5 PFNA	75		25 - 150				06/01/22 19:07	06/03/22 01:43	1
13C4 PFOA	96		25 - 150				06/01/22 19:07	06/03/22 01:43	1
13C2 PFUnA	94		25 - 150				06/01/22 19:07	06/03/22 01:43	1
13C4 PFHpA	88		25 - 150				06/01/22 19:07	06/03/22 01:43	1

Method: 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	200	B	4.4	0.94	ug/Kg	☆	06/01/22 19:07	06/04/22 00:11	20
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOS	108		25 - 150				06/01/22 19:07	06/04/22 00:11	20

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	13.2		0.1	0.1	%	-		05/27/22 09:57	1
Percent Solids	86.8		0.1	0.1	%	-		05/27/22 09:57	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-MW100:0.4

Lab Sample ID: 320-88345-39

Date Collected: 05/24/22 16:30

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 92.0

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.25		0.21	0.032	ug/Kg	✱	06/03/22 11:31	06/15/22 19:19	1
Perfluoroheptanoic acid (PFHpA)	0.054	J	0.21	0.039	ug/Kg	✱	06/03/22 11:31	06/15/22 19:19	1
Perfluorooctanoic acid (PFOA)	0.25		0.21	0.054	ug/Kg	✱	06/03/22 11:31	06/15/22 19:19	1
Perfluorononanoic acid (PFNA)	0.48		0.21	0.023	ug/Kg	✱	06/03/22 11:31	06/15/22 19:19	1
Perfluorodecanoic acid (PFDA)	0.40		0.21	0.049	ug/Kg	✱	06/03/22 11:31	06/15/22 19:19	1
Perfluoroundecanoic acid (PFUnA)	11		0.21	0.043	ug/Kg	✱	06/03/22 11:31	06/15/22 19:19	1
Perfluorododecanoic acid (PFDoA)	0.27		0.21	0.031	ug/Kg	✱	06/03/22 11:31	06/15/22 19:19	1
Perfluorotridecanoic acid (PFTriA)	5.6		0.21	0.022	ug/Kg	✱	06/03/22 11:31	06/15/22 19:19	1
Perfluorotetradecanoic acid (PFTeA)	0.067	J	0.21	0.038	ug/Kg	✱	06/03/22 11:31	06/15/22 19:19	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.039	ug/Kg	✱	06/03/22 11:31	06/15/22 19:19	1
Perfluorohexanesulfonic acid (PFHxS)	2.6		0.21	0.030	ug/Kg	✱	06/03/22 11:31	06/15/22 19:19	1
Perfluorooctanesulfonic acid (PFOS)	94	E	0.21	0.044	ug/Kg	✱	06/03/22 11:31	06/15/22 19:19	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.21	0.024	ug/Kg	✱	06/03/22 11:31	06/15/22 19:19	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.058	J	0.21	0.049	ug/Kg	✱	06/03/22 11:31	06/15/22 19:19	1
F-53B Major	ND		0.21	0.036	ug/Kg	✱	06/03/22 11:31	06/15/22 19:19	1
HFPO-DA (GenX)	ND		0.21	0.042	ug/Kg	✱	06/03/22 11:31	06/15/22 19:19	1
F-53B Minor	ND		0.21	0.032	ug/Kg	✱	06/03/22 11:31	06/15/22 19:19	1
DONA	ND		0.21	0.040	ug/Kg	✱	06/03/22 11:31	06/15/22 19:19	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	92		25 - 150	06/03/22 11:31	06/15/22 19:19	1
13C2 PFDA	54		25 - 150	06/03/22 11:31	06/15/22 19:19	1
13C4 PFOS	63		25 - 150	06/03/22 11:31	06/15/22 19:19	1
d3-NMeFOSAA	47		25 - 150	06/03/22 11:31	06/15/22 19:19	1
d5-NEtFOSAA	46		25 - 150	06/03/22 11:31	06/15/22 19:19	1
13C3 HFPO-DA	89		25 - 150	06/03/22 11:31	06/15/22 19:19	1
18O2 PFHxS	90		25 - 150	06/03/22 11:31	06/15/22 19:19	1
13C3 PFBS	83		25 - 150	06/03/22 11:31	06/15/22 19:19	1
13C2 PFDoA	63		25 - 150	06/03/22 11:31	06/15/22 19:19	1
13C2 PFTeDA	80		25 - 150	06/03/22 11:31	06/15/22 19:19	1
13C5 PFNA	76		25 - 150	06/03/22 11:31	06/15/22 19:19	1
13C4 PFOA	87		25 - 150	06/03/22 11:31	06/15/22 19:19	1
13C2 PFUnA	47		25 - 150	06/03/22 11:31	06/15/22 19:19	1
13C4 PFHpA	91		25 - 150	06/03/22 11:31	06/15/22 19:19	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	8.0		0.1	0.1	%			05/27/22 09:57	1
Percent Solids	92.0		0.1	0.1	%			05/27/22 09:57	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-MW2:0.5

Lab Sample ID: 320-88345-40

Date Collected: 05/25/22 08:00

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 87.1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.053	J	0.21	0.032	ug/Kg	☆	06/03/22 11:31	06/15/22 19:29	1
Perfluoroheptanoic acid (PFHpA)	ND		0.21	0.039	ug/Kg	☆	06/03/22 11:31	06/15/22 19:29	1
Perfluorooctanoic acid (PFOA)	0.060	J	0.21	0.055	ug/Kg	☆	06/03/22 11:31	06/15/22 19:29	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.023	ug/Kg	☆	06/03/22 11:31	06/15/22 19:29	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.049	ug/Kg	☆	06/03/22 11:31	06/15/22 19:29	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.043	ug/Kg	☆	06/03/22 11:31	06/15/22 19:29	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.031	ug/Kg	☆	06/03/22 11:31	06/15/22 19:29	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.022	ug/Kg	☆	06/03/22 11:31	06/15/22 19:29	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.038	ug/Kg	☆	06/03/22 11:31	06/15/22 19:29	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.039	ug/Kg	☆	06/03/22 11:31	06/15/22 19:29	1
Perfluorohexanesulfonic acid (PFHxS)	0.040	J	0.21	0.030	ug/Kg	☆	06/03/22 11:31	06/15/22 19:29	1
Perfluorooctanesulfonic acid (PFOS)	0.39		0.21	0.044	ug/Kg	☆	06/03/22 11:31	06/15/22 19:29	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.21	0.024	ug/Kg	☆	06/03/22 11:31	06/15/22 19:29	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.21	0.049	ug/Kg	☆	06/03/22 11:31	06/15/22 19:29	1
F-53B Major	ND		0.21	0.036	ug/Kg	☆	06/03/22 11:31	06/15/22 19:29	1
HFPO-DA (GenX)	ND		0.21	0.042	ug/Kg	☆	06/03/22 11:31	06/15/22 19:29	1
F-53B Minor	ND		0.21	0.032	ug/Kg	☆	06/03/22 11:31	06/15/22 19:29	1
DONA	ND		0.21	0.040	ug/Kg	☆	06/03/22 11:31	06/15/22 19:29	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	77		25 - 150				06/03/22 11:31	06/15/22 19:29	1
13C2 PFDA	76		25 - 150				06/03/22 11:31	06/15/22 19:29	1
13C4 PFOS	73		25 - 150				06/03/22 11:31	06/15/22 19:29	1
d3-NMeFOSAA	47		25 - 150				06/03/22 11:31	06/15/22 19:29	1
d5-NEtFOSAA	40		25 - 150				06/03/22 11:31	06/15/22 19:29	1
13C3 HFPO-DA	81		25 - 150				06/03/22 11:31	06/15/22 19:29	1
18O2 PFHxS	82		25 - 150				06/03/22 11:31	06/15/22 19:29	1
13C3 PFBS	77		25 - 150				06/03/22 11:31	06/15/22 19:29	1
13C2 PFDoA	49		25 - 150				06/03/22 11:31	06/15/22 19:29	1
13C2 PFTeDA	68		25 - 150				06/03/22 11:31	06/15/22 19:29	1
13C5 PFNA	83		25 - 150				06/03/22 11:31	06/15/22 19:29	1
13C4 PFOA	81		25 - 150				06/03/22 11:31	06/15/22 19:29	1
13C2 PFUnA	55		25 - 150				06/03/22 11:31	06/15/22 19:29	1
13C4 PFHpA	83		25 - 150				06/03/22 11:31	06/15/22 19:29	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	12.9		0.1	0.1	%			05/27/22 09:57	1
Percent Solids	87.1		0.1	0.1	%			05/27/22 09:57	1

Client Sample ID: FP-MW2:7.0

Lab Sample ID: 320-88345-41

Date Collected: 05/25/22 08:05

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 87.2

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.22	0.035	ug/Kg	☆	06/03/22 11:31	06/15/22 19:39	1
Perfluoroheptanoic acid (PFHpA)	ND		0.22	0.043	ug/Kg	☆	06/03/22 11:31	06/15/22 19:39	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-MW2:7.0

Lab Sample ID: 320-88345-41

Date Collected: 05/25/22 08:05

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 87.2

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	ND		0.22	0.060	ug/Kg	☆	06/03/22 11:31	06/15/22 19:39	1
Perfluorononanoic acid (PFNA)	ND		0.22	0.025	ug/Kg	☆	06/03/22 11:31	06/15/22 19:39	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.054	ug/Kg	☆	06/03/22 11:31	06/15/22 19:39	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.047	ug/Kg	☆	06/03/22 11:31	06/15/22 19:39	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.034	ug/Kg	☆	06/03/22 11:31	06/15/22 19:39	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.024	ug/Kg	☆	06/03/22 11:31	06/15/22 19:39	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.042	ug/Kg	☆	06/03/22 11:31	06/15/22 19:39	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.043	ug/Kg	☆	06/03/22 11:31	06/15/22 19:39	1
Perfluorohexanesulfonic acid (PFHxS)	0.16	J	0.22	0.033	ug/Kg	☆	06/03/22 11:31	06/15/22 19:39	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.22	0.048	ug/Kg	☆	06/03/22 11:31	06/15/22 19:39	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.22	0.026	ug/Kg	☆	06/03/22 11:31	06/15/22 19:39	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.22	0.054	ug/Kg	☆	06/03/22 11:31	06/15/22 19:39	1
F-53B Major	ND		0.22	0.039	ug/Kg	☆	06/03/22 11:31	06/15/22 19:39	1
HFPO-DA (GenX)	ND		0.22	0.046	ug/Kg	☆	06/03/22 11:31	06/15/22 19:39	1
F-53B Minor	ND		0.22	0.035	ug/Kg	☆	06/03/22 11:31	06/15/22 19:39	1
DONA	ND		0.22	0.044	ug/Kg	☆	06/03/22 11:31	06/15/22 19:39	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	92		25 - 150				06/03/22 11:31	06/15/22 19:39	1
13C2 PFDA	99		25 - 150				06/03/22 11:31	06/15/22 19:39	1
13C4 PFOS	88		25 - 150				06/03/22 11:31	06/15/22 19:39	1
d3-NMeFOSAA	91		25 - 150				06/03/22 11:31	06/15/22 19:39	1
d5-NEtFOSAA	85		25 - 150				06/03/22 11:31	06/15/22 19:39	1
13C3 HFPO-DA	95		25 - 150				06/03/22 11:31	06/15/22 19:39	1
18O2 PFHxS	88		25 - 150				06/03/22 11:31	06/15/22 19:39	1
13C3 PFBS	86		25 - 150				06/03/22 11:31	06/15/22 19:39	1
13C2 PFDoA	82		25 - 150				06/03/22 11:31	06/15/22 19:39	1
13C2 PFTeDA	79		25 - 150				06/03/22 11:31	06/15/22 19:39	1
13C5 PFNA	100		25 - 150				06/03/22 11:31	06/15/22 19:39	1
13C4 PFOA	88		25 - 150				06/03/22 11:31	06/15/22 19:39	1
13C2 PFUnA	86		25 - 150				06/03/22 11:31	06/15/22 19:39	1
13C4 PFHpA	86		25 - 150				06/03/22 11:31	06/15/22 19:39	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	12.8		0.1	0.1	%			05/27/22 09:57	1
Percent Solids	87.2		0.1	0.1	%			05/27/22 09:57	1

Client Sample ID: FP-MW101:0.5

Lab Sample ID: 320-88345-43

Date Collected: 05/25/22 16:00

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 87.5

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.034	J	0.22	0.034	ug/Kg	☆	06/03/22 11:31	06/15/22 19:59	1
Perfluoroheptanoic acid (PFHpA)	ND		0.22	0.041	ug/Kg	☆	06/03/22 11:31	06/15/22 19:59	1
Perfluorooctanoic acid (PFOA)	ND		0.22	0.058	ug/Kg	☆	06/03/22 11:31	06/15/22 19:59	1
Perfluorononanoic acid (PFNA)	ND		0.22	0.024	ug/Kg	☆	06/03/22 11:31	06/15/22 19:59	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.052	ug/Kg	☆	06/03/22 11:31	06/15/22 19:59	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-MW101:0.5

Lab Sample ID: 320-88345-43

Date Collected: 05/25/22 16:00

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 87.5

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.046	ug/Kg	☆	06/03/22 11:31	06/15/22 19:59	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.033	ug/Kg	☆	06/03/22 11:31	06/15/22 19:59	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.023	ug/Kg	☆	06/03/22 11:31	06/15/22 19:59	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.040	ug/Kg	☆	06/03/22 11:31	06/15/22 19:59	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.041	ug/Kg	☆	06/03/22 11:31	06/15/22 19:59	1
Perfluorohexanesulfonic acid (PFHxS)	0.040	J	0.22	0.032	ug/Kg	☆	06/03/22 11:31	06/15/22 19:59	1
Perfluorooctanesulfonic acid (PFOS)	0.25		0.22	0.047	ug/Kg	☆	06/03/22 11:31	06/15/22 19:59	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.22	0.025	ug/Kg	☆	06/03/22 11:31	06/15/22 19:59	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.22	0.052	ug/Kg	☆	06/03/22 11:31	06/15/22 19:59	1
F-53B Major	ND		0.22	0.038	ug/Kg	☆	06/03/22 11:31	06/15/22 19:59	1
HFPO-DA (GenX)	ND		0.22	0.045	ug/Kg	☆	06/03/22 11:31	06/15/22 19:59	1
F-53B Minor	ND		0.22	0.034	ug/Kg	☆	06/03/22 11:31	06/15/22 19:59	1
DONA	ND		0.22	0.042	ug/Kg	☆	06/03/22 11:31	06/15/22 19:59	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	78		25 - 150				06/03/22 11:31	06/15/22 19:59	1
13C2 PFDA	81		25 - 150				06/03/22 11:31	06/15/22 19:59	1
13C4 PFOS	81		25 - 150				06/03/22 11:31	06/15/22 19:59	1
d3-NMeFOSAA	69		25 - 150				06/03/22 11:31	06/15/22 19:59	1
d5-NEtFOSAA	61		25 - 150				06/03/22 11:31	06/15/22 19:59	1
13C3 HFPO-DA	85		25 - 150				06/03/22 11:31	06/15/22 19:59	1
18O2 PFHxS	80		25 - 150				06/03/22 11:31	06/15/22 19:59	1
13C3 PFBS	73		25 - 150				06/03/22 11:31	06/15/22 19:59	1
13C2 PFDoA	61		25 - 150				06/03/22 11:31	06/15/22 19:59	1
13C2 PFTeDA	65		25 - 150				06/03/22 11:31	06/15/22 19:59	1
13C5 PFNA	89		25 - 150				06/03/22 11:31	06/15/22 19:59	1
13C4 PFOA	79		25 - 150				06/03/22 11:31	06/15/22 19:59	1
13C2 PFUnA	69		25 - 150				06/03/22 11:31	06/15/22 19:59	1
13C4 PFHpA	81		25 - 150				06/03/22 11:31	06/15/22 19:59	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	12.5		0.1	0.1	%			05/27/22 09:57	1
Percent Solids	87.5		0.1	0.1	%			05/27/22 09:57	1

Client Sample ID: FP-HA1:0.8

Lab Sample ID: 320-88345-44

Date Collected: 05/25/22 09:05

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 90.9

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	1.5		0.21	0.033	ug/Kg	☆	06/03/22 11:31	06/15/22 20:09	1
Perfluoroheptanoic acid (PFHpA)	0.81		0.21	0.040	ug/Kg	☆	06/03/22 11:31	06/15/22 20:09	1
Perfluorooctanoic acid (PFOA)	0.15	J	0.21	0.056	ug/Kg	☆	06/03/22 11:31	06/15/22 20:09	1
Perfluorononanoic acid (PFNA)	1.1		0.21	0.023	ug/Kg	☆	06/03/22 11:31	06/15/22 20:09	1
Perfluorodecanoic acid (PFDA)	0.40		0.21	0.051	ug/Kg	☆	06/03/22 11:31	06/15/22 20:09	1
Perfluoroundecanoic acid (PFUnA)	0.26		0.21	0.045	ug/Kg	☆	06/03/22 11:31	06/15/22 20:09	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-HA1:0.8

Lab Sample ID: 320-88345-44

Date Collected: 05/25/22 09:05

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 90.9

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorododecanoic acid (PFDoA)	0.037	J	0.21	0.032	ug/Kg	☆	06/03/22 11:31	06/15/22 20:09	1
Perfluorotridecanoic acid (PFTriA)	0.066	J	0.21	0.022	ug/Kg	☆	06/03/22 11:31	06/15/22 20:09	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.039	ug/Kg	☆	06/03/22 11:31	06/15/22 20:09	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.040	ug/Kg	☆	06/03/22 11:31	06/15/22 20:09	1
Perfluorohexanesulfonic acid (PFHxS)	0.060	J	0.21	0.031	ug/Kg	☆	06/03/22 11:31	06/15/22 20:09	1
Perfluorooctanesulfonic acid (PFOS)	1.2		0.21	0.046	ug/Kg	☆	06/03/22 11:31	06/15/22 20:09	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.21	0.025	ug/Kg	☆	06/03/22 11:31	06/15/22 20:09	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.21	0.051	ug/Kg	☆	06/03/22 11:31	06/15/22 20:09	1
F-53B Major	ND		0.21	0.037	ug/Kg	☆	06/03/22 11:31	06/15/22 20:09	1
HFPO-DA (GenX)	ND		0.21	0.044	ug/Kg	☆	06/03/22 11:31	06/15/22 20:09	1
F-53B Minor	ND		0.21	0.033	ug/Kg	☆	06/03/22 11:31	06/15/22 20:09	1
DONA	ND		0.21	0.042	ug/Kg	☆	06/03/22 11:31	06/15/22 20:09	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	89		25 - 150				06/03/22 11:31	06/15/22 20:09	1
13C2 PFDA	91		25 - 150				06/03/22 11:31	06/15/22 20:09	1
13C4 PFOS	86		25 - 150				06/03/22 11:31	06/15/22 20:09	1
d3-NMeFOSAA	81		25 - 150				06/03/22 11:31	06/15/22 20:09	1
d5-NEtFOSAA	74		25 - 150				06/03/22 11:31	06/15/22 20:09	1
13C3 HFPO-DA	87		25 - 150				06/03/22 11:31	06/15/22 20:09	1
18O2 PFHxS	88		25 - 150				06/03/22 11:31	06/15/22 20:09	1
13C3 PFBS	84		25 - 150				06/03/22 11:31	06/15/22 20:09	1
13C2 PFDoA	69		25 - 150				06/03/22 11:31	06/15/22 20:09	1
13C2 PFTeDA	74		25 - 150				06/03/22 11:31	06/15/22 20:09	1
13C5 PFNA	95		25 - 150				06/03/22 11:31	06/15/22 20:09	1
13C4 PFOA	91		25 - 150				06/03/22 11:31	06/15/22 20:09	1
13C2 PFUnA	82		25 - 150				06/03/22 11:31	06/15/22 20:09	1
13C4 PFHpA	89		25 - 150				06/03/22 11:31	06/15/22 20:09	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	9.1		0.1	0.1	%			05/27/22 09:57	1
Percent Solids	90.9		0.1	0.1	%			05/27/22 09:57	1

Client Sample ID: FP-HA1:4.0

Lab Sample ID: 320-88345-45

Date Collected: 05/25/22 09:15

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 89.4

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	3.1		0.22	0.034	ug/Kg	☆	06/03/22 11:31	06/15/22 20:30	1
Perfluoroheptanoic acid (PFHpA)	1.3		0.22	0.042	ug/Kg	☆	06/03/22 11:31	06/15/22 20:30	1
Perfluorooctanoic acid (PFOA)	0.084	J	0.22	0.058	ug/Kg	☆	06/03/22 11:31	06/15/22 20:30	1
Perfluorononanoic acid (PFNA)	0.13	J	0.22	0.024	ug/Kg	☆	06/03/22 11:31	06/15/22 20:30	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.053	ug/Kg	☆	06/03/22 11:31	06/15/22 20:30	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.046	ug/Kg	☆	06/03/22 11:31	06/15/22 20:30	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.033	ug/Kg	☆	06/03/22 11:31	06/15/22 20:30	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-HA1:4.0

Lab Sample ID: 320-88345-45

Date Collected: 05/25/22 09:15

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 89.4

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.023	ug/Kg	☆	06/03/22 11:31	06/15/22 20:30	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.040	ug/Kg	☆	06/03/22 11:31	06/15/22 20:30	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.042	ug/Kg	☆	06/03/22 11:31	06/15/22 20:30	1
Perfluorohexanesulfonic acid (PFHxS)	0.12	J	0.22	0.032	ug/Kg	☆	06/03/22 11:31	06/15/22 20:30	1
Perfluorooctanesulfonic acid (PFOS)	0.38		0.22	0.047	ug/Kg	☆	06/03/22 11:31	06/15/22 20:30	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.22	0.025	ug/Kg	☆	06/03/22 11:31	06/15/22 20:30	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.22	0.053	ug/Kg	☆	06/03/22 11:31	06/15/22 20:30	1
F-53B Major	ND		0.22	0.038	ug/Kg	☆	06/03/22 11:31	06/15/22 20:30	1
HFPO-DA (GenX)	ND		0.22	0.045	ug/Kg	☆	06/03/22 11:31	06/15/22 20:30	1
F-53B Minor	ND		0.22	0.034	ug/Kg	☆	06/03/22 11:31	06/15/22 20:30	1
DONA	ND		0.22	0.043	ug/Kg	☆	06/03/22 11:31	06/15/22 20:30	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	82		25 - 150				06/03/22 11:31	06/15/22 20:30	1
13C2 PFDA	87		25 - 150				06/03/22 11:31	06/15/22 20:30	1
13C4 PFOS	77		25 - 150				06/03/22 11:31	06/15/22 20:30	1
d3-NMeFOSAA	76		25 - 150				06/03/22 11:31	06/15/22 20:30	1
d5-NEtFOSAA	75		25 - 150				06/03/22 11:31	06/15/22 20:30	1
13C3 HFPO-DA	85		25 - 150				06/03/22 11:31	06/15/22 20:30	1
18O2 PFHxS	77		25 - 150				06/03/22 11:31	06/15/22 20:30	1
13C3 PFBS	73		25 - 150				06/03/22 11:31	06/15/22 20:30	1
13C2 PFDoA	75		25 - 150				06/03/22 11:31	06/15/22 20:30	1
13C2 PFTeDA	65		25 - 150				06/03/22 11:31	06/15/22 20:30	1
13C5 PFNA	87		25 - 150				06/03/22 11:31	06/15/22 20:30	1
13C4 PFOA	82		25 - 150				06/03/22 11:31	06/15/22 20:30	1
13C2 PFUnA	80		25 - 150				06/03/22 11:31	06/15/22 20:30	1
13C4 PFHpA	80		25 - 150				06/03/22 11:31	06/15/22 20:30	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	10.6		0.1	0.1	%			05/27/22 09:57	1
Percent Solids	89.4		0.1	0.1	%			05/27/22 09:57	1

Client Sample ID: FP-MW3:0.5

Lab Sample ID: 320-88345-46

Date Collected: 05/25/22 10:40

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 86.7

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.12	J	0.21	0.032	ug/Kg	☆	06/03/22 11:31	06/15/22 20:40	1
Perfluoroheptanoic acid (PFHpA)	0.067	J	0.21	0.039	ug/Kg	☆	06/03/22 11:31	06/15/22 20:40	1
Perfluorooctanoic acid (PFOA)	0.16	J	0.21	0.055	ug/Kg	☆	06/03/22 11:31	06/15/22 20:40	1
Perfluorononanoic acid (PFNA)	0.16	J	0.21	0.023	ug/Kg	☆	06/03/22 11:31	06/15/22 20:40	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.049	ug/Kg	☆	06/03/22 11:31	06/15/22 20:40	1
Perfluoroundecanoic acid (PFUnA)	0.14	J	0.21	0.043	ug/Kg	☆	06/03/22 11:31	06/15/22 20:40	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.031	ug/Kg	☆	06/03/22 11:31	06/15/22 20:40	1
Perfluorotridecanoic acid (PFTriA)	0.060	J	0.21	0.022	ug/Kg	☆	06/03/22 11:31	06/15/22 20:40	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-MW3:0.5

Lab Sample ID: 320-88345-46

Date Collected: 05/25/22 10:40

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 86.7

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.038	ug/Kg	☆	06/03/22 11:31	06/15/22 20:40	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.039	ug/Kg	☆	06/03/22 11:31	06/15/22 20:40	1
Perfluorohexanesulfonic acid (PFHxS)	3.6		0.21	0.030	ug/Kg	☆	06/03/22 11:31	06/15/22 20:40	1
Perfluorooctanesulfonic acid (PFOS)	18		0.21	0.044	ug/Kg	☆	06/03/22 11:31	06/15/22 20:40	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.21	0.024	ug/Kg	☆	06/03/22 11:31	06/15/22 20:40	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.21	0.049	ug/Kg	☆	06/03/22 11:31	06/15/22 20:40	1
F-53B Major	ND		0.21	0.036	ug/Kg	☆	06/03/22 11:31	06/15/22 20:40	1
HFPO-DA (GenX)	ND		0.21	0.042	ug/Kg	☆	06/03/22 11:31	06/15/22 20:40	1
F-53B Minor	ND		0.21	0.032	ug/Kg	☆	06/03/22 11:31	06/15/22 20:40	1
DONA	ND		0.21	0.040	ug/Kg	☆	06/03/22 11:31	06/15/22 20:40	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	84		25 - 150	06/03/22 11:31	06/15/22 20:40	1
13C2 PFDA	81		25 - 150	06/03/22 11:31	06/15/22 20:40	1
13C4 PFOS	78		25 - 150	06/03/22 11:31	06/15/22 20:40	1
d3-NMeFOSAA	58		25 - 150	06/03/22 11:31	06/15/22 20:40	1
d5-NEtFOSAA	49		25 - 150	06/03/22 11:31	06/15/22 20:40	1
13C3 HFPO-DA	83		25 - 150	06/03/22 11:31	06/15/22 20:40	1
18O2 PFHxS	84		25 - 150	06/03/22 11:31	06/15/22 20:40	1
13C3 PFBS	77		25 - 150	06/03/22 11:31	06/15/22 20:40	1
13C2 PFDoA	53		25 - 150	06/03/22 11:31	06/15/22 20:40	1
13C2 PFTeDA	71		25 - 150	06/03/22 11:31	06/15/22 20:40	1
13C5 PFNA	89		25 - 150	06/03/22 11:31	06/15/22 20:40	1
13C4 PFOA	82		25 - 150	06/03/22 11:31	06/15/22 20:40	1
13C2 PFUnA	60		25 - 150	06/03/22 11:31	06/15/22 20:40	1
13C4 PFHpA	82		25 - 150	06/03/22 11:31	06/15/22 20:40	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	13.3		0.1	0.1	%			05/27/22 09:57	1
Percent Solids	86.7		0.1	0.1	%			05/27/22 09:57	1

Client Sample ID: FP-MW3:2.7

Lab Sample ID: 320-88345-47

Date Collected: 05/25/22 10:45

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 88.4

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.30		0.20	0.032	ug/Kg	☆	06/03/22 11:31	06/15/22 20:50	1
Perfluoroheptanoic acid (PFHpA)	0.18	J	0.20	0.039	ug/Kg	☆	06/03/22 11:31	06/15/22 20:50	1
Perfluorooctanoic acid (PFOA)	0.12	J	0.20	0.054	ug/Kg	☆	06/03/22 11:31	06/15/22 20:50	1
Perfluorononanoic acid (PFNA)	0.085	J	0.20	0.022	ug/Kg	☆	06/03/22 11:31	06/15/22 20:50	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.049	ug/Kg	☆	06/03/22 11:31	06/15/22 20:50	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.043	ug/Kg	☆	06/03/22 11:31	06/15/22 20:50	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.031	ug/Kg	☆	06/03/22 11:31	06/15/22 20:50	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.021	ug/Kg	☆	06/03/22 11:31	06/15/22 20:50	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.038	ug/Kg	☆	06/03/22 11:31	06/15/22 20:50	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.039	ug/Kg	☆	06/03/22 11:31	06/15/22 20:50	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-MW3:2.7

Lab Sample ID: 320-88345-47

Date Collected: 05/25/22 10:45

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 88.4

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanesulfonic acid (PFHxS)	1.0		0.20	0.029	ug/Kg	☆	06/03/22 11:31	06/15/22 20:50	1
Perfluorooctanesulfonic acid (PFOS)	3.1		0.20	0.044	ug/Kg	☆	06/03/22 11:31	06/15/22 20:50	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.20	0.023	ug/Kg	☆	06/03/22 11:31	06/15/22 20:50	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.20	0.049	ug/Kg	☆	06/03/22 11:31	06/15/22 20:50	1
F-53B Major	ND		0.20	0.036	ug/Kg	☆	06/03/22 11:31	06/15/22 20:50	1
HFPO-DA (GenX)	ND		0.20	0.042	ug/Kg	☆	06/03/22 11:31	06/15/22 20:50	1
F-53B Minor	ND		0.20	0.032	ug/Kg	☆	06/03/22 11:31	06/15/22 20:50	1
DONA	ND		0.20	0.040	ug/Kg	☆	06/03/22 11:31	06/15/22 20:50	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	78		25 - 150				06/03/22 11:31	06/15/22 20:50	1
13C2 PFDA	76		25 - 150				06/03/22 11:31	06/15/22 20:50	1
13C4 PFOS	78		25 - 150				06/03/22 11:31	06/15/22 20:50	1
d3-NMeFOSAA	55		25 - 150				06/03/22 11:31	06/15/22 20:50	1
d5-NEtFOSAA	48		25 - 150				06/03/22 11:31	06/15/22 20:50	1
13C3 HFPO-DA	84		25 - 150				06/03/22 11:31	06/15/22 20:50	1
18O2 PFHxS	84		25 - 150				06/03/22 11:31	06/15/22 20:50	1
13C3 PFBS	79		25 - 150				06/03/22 11:31	06/15/22 20:50	1
13C2 PFDoA	50		25 - 150				06/03/22 11:31	06/15/22 20:50	1
13C2 PFTeDA	57		25 - 150				06/03/22 11:31	06/15/22 20:50	1
13C5 PFNA	88		25 - 150				06/03/22 11:31	06/15/22 20:50	1
13C4 PFOA	78		25 - 150				06/03/22 11:31	06/15/22 20:50	1
13C2 PFUnA	61		25 - 150				06/03/22 11:31	06/15/22 20:50	1
13C4 PFHpA	80		25 - 150				06/03/22 11:31	06/15/22 20:50	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	11.6		0.1	0.1	%			05/27/22 09:57	1
Percent Solids	88.4		0.1	0.1	%			05/27/22 09:57	1

Client Sample ID: FP-MW102:0.5

Lab Sample ID: 320-88345-49

Date Collected: 05/25/22 16:15

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 90.5

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.072	J	0.22	0.034	ug/Kg	☆	06/03/22 11:31	06/15/22 21:10	1
Perfluoroheptanoic acid (PFHpA)	0.049	J	0.22	0.041	ug/Kg	☆	06/03/22 11:31	06/15/22 21:10	1
Perfluorooctanoic acid (PFOA)	0.11	J	0.22	0.058	ug/Kg	☆	06/03/22 11:31	06/15/22 21:10	1
Perfluorononanoic acid (PFNA)	0.090	J	0.22	0.024	ug/Kg	☆	06/03/22 11:31	06/15/22 21:10	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.052	ug/Kg	☆	06/03/22 11:31	06/15/22 21:10	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.046	ug/Kg	☆	06/03/22 11:31	06/15/22 21:10	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.033	ug/Kg	☆	06/03/22 11:31	06/15/22 21:10	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.023	ug/Kg	☆	06/03/22 11:31	06/15/22 21:10	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.040	ug/Kg	☆	06/03/22 11:31	06/15/22 21:10	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.041	ug/Kg	☆	06/03/22 11:31	06/15/22 21:10	1
Perfluorohexanesulfonic acid (PFHxS)	2.5		0.22	0.032	ug/Kg	☆	06/03/22 11:31	06/15/22 21:10	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-MW102:0.5

Lab Sample ID: 320-88345-49

Date Collected: 05/25/22 16:15

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 90.5

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	5.0		0.22	0.047	ug/Kg	☆	06/03/22 11:31	06/15/22 21:10	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.22	0.025	ug/Kg	☆	06/03/22 11:31	06/15/22 21:10	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.22	0.052	ug/Kg	☆	06/03/22 11:31	06/15/22 21:10	1
F-53B Major	ND		0.22	0.038	ug/Kg	☆	06/03/22 11:31	06/15/22 21:10	1
HFPO-DA (GenX)	ND		0.22	0.045	ug/Kg	☆	06/03/22 11:31	06/15/22 21:10	1
F-53B Minor	ND		0.22	0.034	ug/Kg	☆	06/03/22 11:31	06/15/22 21:10	1
DONA	ND		0.22	0.042	ug/Kg	☆	06/03/22 11:31	06/15/22 21:10	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	81		25 - 150				06/03/22 11:31	06/15/22 21:10	1
13C2 PFDA	87		25 - 150				06/03/22 11:31	06/15/22 21:10	1
13C4 PFOS	84		25 - 150				06/03/22 11:31	06/15/22 21:10	1
d3-NMeFOSAA	73		25 - 150				06/03/22 11:31	06/15/22 21:10	1
d5-NEtFOSAA	77		25 - 150				06/03/22 11:31	06/15/22 21:10	1
13C3 HFPO-DA	79		25 - 150				06/03/22 11:31	06/15/22 21:10	1
18O2 PFHxS	78		25 - 150				06/03/22 11:31	06/15/22 21:10	1
13C3 PFBS	73		25 - 150				06/03/22 11:31	06/15/22 21:10	1
13C2 PFDoA	71		25 - 150				06/03/22 11:31	06/15/22 21:10	1
13C2 PFTeDA	58		25 - 150				06/03/22 11:31	06/15/22 21:10	1
13C5 PFNA	87		25 - 150				06/03/22 11:31	06/15/22 21:10	1
13C4 PFOA	85		25 - 150				06/03/22 11:31	06/15/22 21:10	1
13C2 PFUnA	84		25 - 150				06/03/22 11:31	06/15/22 21:10	1
13C4 PFHpA	79		25 - 150				06/03/22 11:31	06/15/22 21:10	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	9.5		0.1	0.1	%			05/27/22 09:57	1
Percent Solids	90.5		0.1	0.1	%			05/27/22 09:57	1

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)							C3PFBS (25-150)
		PFHxA (25-150)	PFDA (25-150)	PFOS (25-150)	d3NMFOS (25-150)	d5NEFOS (25-150)	HFPODA (25-150)	PFHxS (25-150)	
320-88345-1	FP-P9:0.5	87	85	65	71	78	78	77	69
320-88345-1 - DL	FP-P9:0.5			85					
320-88345-2	FP-P9:6.5	86	88	72	74	81	79	82	79
320-88345-2 - DL	FP-P9:6.5			83					
320-88345-5	FP-P1:0.2	86	90	73	100	115	86	78	82
320-88345-5 MS	FP-P1:0.2	93	105	88	104	126	96	92	83
320-88345-5 MSD	FP-P1:0.2	93	92	82	100	109	89	83	82
320-88345-6	FP-P1:10.2	89	100	90	108	114	92	86	83
320-88345-8	FP-P2:0.2	91	106	84	89	119	98	81	74
320-88345-9	FP-P2:5.3	82	83	77	83	92	80		82
320-88345-9 - DL	FP-P2:5.3							92	
320-88345-12	FP-P3:1.2	89	89	83	104	112	86	85	83
320-88345-13	FP-P3:6.3	101	108	99	109	130	104	110	99
320-88345-15	FP-SH1:0.5	95	101	91	99	113	97	80	91
320-88345-17	FP-P4:1.4	89	92	76	96	105	91	85	75
320-88345-18	FP-P4:11.6	93	101	86	105	126	95	93	90
320-88345-21	FP-SH2:0.5	85	88	78	99	104	90	85	82
320-88345-22	FP-P5:0.5	94	106	87	108	115	97	87	90
320-88345-23	FP-P5:7.5	87	91	76	100	106	85	81	81
320-88345-25	FP-P6:0.5	89	90	73	95	105	79	86	80
320-88345-25 - DL	FP-P6:0.5			80					
320-88345-26	FP-P6:3.4	90	90	84	99	111	89	87	84
320-88345-28	FP-P7:0.5	91	102	50	102	109	96	96	93
320-88345-28 - DL	FP-P7:0.5			80					
320-88345-28 MS	FP-P7:0.5	97	94	46	108	92	92	94	82
320-88345-28 MS - DL	FP-P7:0.5			93					
320-88345-28 MSD	FP-P7:0.5	115	113	53	117	126	111	103	107
320-88345-28 MSD - DL	FP-P7:0.5			109					
320-88345-29	FP-P7:7.0	101	93	61	99	107	84	79	80
320-88345-29 - DL	FP-P7:7.0			99					
320-88345-31	FP-P100:0.5	106	118	56	115	114	98	103	98
320-88345-31 - DL	FP-P100:0.5			92					
320-88345-32	FP-P8:1.5	107	109	94	114	118	108	93	95
320-88345-33	FP-P8:6.3	87	82	74	84	84	96	88	84
320-88345-33 MS	FP-P8:6.3	92	88	86	89	86	90	97	91
320-88345-33 MSD	FP-P8:6.3	88	81	80	79	87	82	87	85
320-88345-35	FP-P101:1.5	88	96	81	94	94	89	87	84
320-88345-35 - DL	FP-P101:1.5			80					
320-88345-36	FP-MW1:0.4	85	70	77	37	33	88	90	86
320-88345-37	FP-MW1:7.6	94	99	69	109	110	93	88	84
320-88345-37 - DL	FP-MW1:7.6			108					
320-88345-39	FP-MW100:0.4	92	54	63	47	46	89	90	83
320-88345-40	FP-MW2:0.5	77	76	73	47	40	81	82	77
320-88345-41	FP-MW2:7.0	92	99	88	91	85	95	88	86
320-88345-43	FP-MW101:0.5	78	81	81	69	61	85	80	73
320-88345-44	FP-HA1:0.8	89	91	86	81	74	87	88	84
320-88345-45	FP-HA1:4.0	82	87	77	76	75	85	77	73
320-88345-46	FP-MW3:0.5	84	81	78	58	49	83	84	77
320-88345-47	FP-MW3:2.7	78	76	78	55	48	84	84	79

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Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Matrix: Solid

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFHxA (25-150)	PFDA (25-150)	PFOS (25-150)	d3NMFOs (25-150)	d5NEFOs (25-150)	HFPODA (25-150)	PFHxS (25-150)	C3PFBS (25-150)
320-88345-49	FP-MW102:0.5	81	87	84	73	77	79	78	73
LCS 320-591338/2-A	Lab Control Sample	103	89	83	78	81	85	91	81
LCS 320-592016/2-A	Lab Control Sample	96	109	95	113	123	100	103	97
LCS 320-592017/2-A	Lab Control Sample	90	86	82	75	79	81	86	78
LCS 320-592524/2-A	Lab Control Sample	90	94	97	86	81	87	96	89
LCS 320-593335/2-A	Lab Control Sample	95	87	83	89	94	95	96	96
MB 320-591338/1-A	Method Blank	96	91	86	84	81	95	95	87
MB 320-592016/1-A	Method Blank	93	99	93	111	118	94	93	103
MB 320-592017/1-A	Method Blank	91	88	84	76	81	85	91	80
MB 320-592524/1-A	Method Blank	96	97	95	85	80	94	97	90
MB 320-593335/1-A	Method Blank	83	78	78	83	87	79	86	84
		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFDaA (25-150)	PFTDA (25-150)	PFNA (25-150)	PFOA (25-150)	PFUnA (25-150)	C4PFHA (25-150)		
320-88345-1	FP-P9:0.5	79	68	78	83	80	93		
320-88345-1 - DL	FP-P9:0.5								
320-88345-2	FP-P9:6.5	80	75	79	83	82	91		
320-88345-2 - DL	FP-P9:6.5								
320-88345-5	FP-P1:0.2	94	95	90	94	94	86		
320-88345-5 MS	FP-P1:0.2	111	100	102	95	100	102		
320-88345-5 MSD	FP-P1:0.2	108	95	96	98	92	98		
320-88345-6	FP-P1:10.2	98	88	96	92	93	94		
320-88345-8	FP-P2:0.2	107	95	104	94	99	100		
320-88345-9	FP-P2:5.3	92	86	85	85	84	83		
320-88345-9 - DL	FP-P2:5.3								
320-88345-12	FP-P3:1.2	93	85	88	86	90	92		
320-88345-13	FP-P3:6.3	115	100	104	96	96	107		
320-88345-15	FP-SH1:0.5	101	96	101	94	104	92		
320-88345-17	FP-P4:1.4	94	88	93	87	84	90		
320-88345-18	FP-P4:11.6	108	103	98	102	101	98		
320-88345-21	FP-SH2:0.5	96	90	93	93	96	94		
320-88345-22	FP-P5:0.5	101	95	101	96	94	106		
320-88345-23	FP-P5:7.5	95	86	91	93	89	84		
320-88345-25	FP-P6:0.5	95	84	84	89	94	95		
320-88345-25 - DL	FP-P6:0.5								
320-88345-26	FP-P6:3.4	95	91	93	91	92	96		
320-88345-28	FP-P7:0.5	116	103	54	100	94	106		
320-88345-28 - DL	FP-P7:0.5					80			
320-88345-28 MS	FP-P7:0.5	101	98	49	95	95	97		
320-88345-28 MS - DL	FP-P7:0.5					105			
320-88345-28 MSD	FP-P7:0.5	118	110	60	107	112	120		
320-88345-28 MSD - DL	FP-P7:0.5					100			
320-88345-29	FP-P7:7.0	91	72	74	91	89	94		
320-88345-29 - DL	FP-P7:7.0								
320-88345-31	FP-P100:0.5	112	106	65	100	101	115		
320-88345-31 - DL	FP-P100:0.5					102			
320-88345-32	FP-P8:1.5	114	109	104	103	103	107		
320-88345-33	FP-P8:6.3	82	67	87	87	80	89		
320-88345-33 MS	FP-P8:6.3	85	72	90	92	86	94		
320-88345-33 MSD	FP-P8:6.3	83	66	86	89	79	90		

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Isotope Dilution Summary

Client: Shannon & Wilson, Inc

Job ID: 320-88345-1

Project/Site: Paine Field

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)					
		PFDaA (25-150)	PFTDA (25-150)	PFNA (25-150)	PFOA (25-150)	PFUnA (25-150)	C4PFHA (25-150)
320-88345-35	FP-P101:1.5	100	94	86	96	91	92
320-88345-35 - DL	FP-P101:1.5						
320-88345-36	FP-MW1:0.4	41	68	87	88	44	87
320-88345-37	FP-MW1:7.6	106	97	75	96	94	88
320-88345-37 - DL	FP-MW1:7.6						
320-88345-39	FP-MW100:0.4	63	80	76	87	47	91
320-88345-40	FP-MW2:0.5	49	68	83	81	55	83
320-88345-41	FP-MW2:7.0	82	79	100	88	86	86
320-88345-43	FP-MW101:0.5	61	65	89	79	69	81
320-88345-44	FP-HA1:0.8	69	74	95	91	82	89
320-88345-45	FP-HA1:4.0	75	65	87	82	80	80
320-88345-46	FP-MW3:0.5	53	71	89	82	60	82
320-88345-47	FP-MW3:2.7	50	57	88	78	61	80
320-88345-49	FP-MW102:0.5	71	58	87	85	84	79
LCS 320-591338/2-A	Lab Control Sample	80	68	90	87	80	101
LCS 320-592016/2-A	Lab Control Sample	114	99	103	98	105	111
LCS 320-592017/2-A	Lab Control Sample	82	73	83	83	77	95
LCS 320-592524/2-A	Lab Control Sample	83	90	99	91	87	97
LCS 320-593335/2-A	Lab Control Sample	84	66	88	91	82	93
MB 320-591338/1-A	Method Blank	82	72	89	91	83	104
MB 320-592016/1-A	Method Blank	104	95	96	101	93	102
MB 320-592017/1-A	Method Blank	86	80	86	87	78	97
MB 320-592524/1-A	Method Blank	85	90	102	96	88	95
MB 320-593335/1-A	Method Blank	76	63	79	83	77	81

Surrogate Legend

PFHxA = 13C2 PFHxA

PFDA = 13C2 PFDA

PFOS = 13C4 PFOS

d3NMFOS = d3-NMeFOSAA

d5NEFOS = d5-NEtFOSAA

HFPODA = 13C3 HFPO-DA

PFHxS = 18O2 PFHxS

C3PFBS = 13C3 PFBS

PFDaA = 13C2 PFDaA

PFTDA = 13C2 PFTeDA

PFNA = 13C5 PFNA

PFOA = 13C4 PFOA

PFUnA = 13C2 PFUnA

C4PFHA = 13C4 PFHpA

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)							
		PFHxA (25-150)	PFDA (25-150)	d5NEFOS (25-150)	HFPODA (25-150)	PFOS (25-150)	d3NMFOS (25-150)	PFHxS (25-150)	C3PFBS (25-150)
320-88345-4	FP-P9:GW	93	85	69	91	91	78	97	95
320-88345-11	FP-P2:GW	96	88	79	88	88	85		97
320-88345-11 - DL	FP-P2:GW							103	
320-88345-16	FP-P3:GW		142	120	141	129	126	152 *5+	125

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Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Matrix: Water

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFHxA (25-150)	PFDA (25-150)	d5NEFOS (25-150)	HFPODA (25-150)	PFOS (25-150)	d3NMFOS (25-150)	PFHxS (25-150)	C3PFBS (25-150)
320-88345-16 - DL	FP-P3:GW								
320-88345-16 - DL2	FP-P3:GW	98							
320-88345-20	FP-P4:GW		87	78	97	88	86		91
320-88345-20 - DL	FP-P4:GW	89						92	
LCS 320-592403/2-A	Lab Control Sample	106	95	94	97	95	98	108	105
LCSD 320-592403/3-A	Lab Control Sample Dup	94	98	96	91	93	93	94	91
MB 320-592403/1-A	Method Blank	105	92	96	95	95	92	104	104

		Percent Isotope Dilution Recovery (Acceptance Limits)					
Lab Sample ID	Client Sample ID	PFDaA (25-150)	PFTDA (25-150)	PFNA (25-150)	PFOA (25-150)	PFUnA (25-150)	C4PFHA (25-150)
320-88345-4	FP-P9:GW	58	53	89	95	73	92
320-88345-11	FP-P2:GW	69	52	91	92	81	94
320-88345-11 - DL	FP-P2:GW						
320-88345-16	FP-P3:GW	108	87	143	92	116	
320-88345-16 - DL	FP-P3:GW						102
320-88345-16 - DL2	FP-P3:GW						
320-88345-20	FP-P4:GW	76	59	93	91	78	92
320-88345-20 - DL	FP-P4:GW						
LCS 320-592403/2-A	Lab Control Sample	97	88	91	102	92	107
LCSD 320-592403/3-A	Lab Control Sample Dup	87	78	94	93	89	91
MB 320-592403/1-A	Method Blank	90	82	97	102	90	98

Surrogate Legend

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA
d5NEFOS = d5-NEtFOSAA
HFPODA = 13C3 HFPO-DA
PFOS = 13C4 PFOS
d3NMFOS = d3-NMeFOSAA
PFHxS = 18O2 PFHxS
C3PFBS = 13C3 PFBS
PFDaA = 13C2 PFDaA
PFTDA = 13C2 PFTeDA
PFNA = 13C5 PFNA
PFOA = 13C4 PFOA
PFUnA = 13C2 PFUnA
C4PFHA = 13C4 PFHpA

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-591338/1-A

Matrix: Solid

Analysis Batch: 592050

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 591338

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.031	ug/Kg		05/30/22 12:03	06/02/22 16:09	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.038	ug/Kg		05/30/22 12:03	06/02/22 16:09	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.053	ug/Kg		05/30/22 12:03	06/02/22 16:09	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.022	ug/Kg		05/30/22 12:03	06/02/22 16:09	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.048	ug/Kg		05/30/22 12:03	06/02/22 16:09	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.042	ug/Kg		05/30/22 12:03	06/02/22 16:09	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.030	ug/Kg		05/30/22 12:03	06/02/22 16:09	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.021	ug/Kg		05/30/22 12:03	06/02/22 16:09	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.037	ug/Kg		05/30/22 12:03	06/02/22 16:09	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.038	ug/Kg		05/30/22 12:03	06/02/22 16:09	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.029	ug/Kg		05/30/22 12:03	06/02/22 16:09	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.20	0.043	ug/Kg		05/30/22 12:03	06/02/22 16:09	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.20	0.023	ug/Kg		05/30/22 12:03	06/02/22 16:09	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.20	0.048	ug/Kg		05/30/22 12:03	06/02/22 16:09	1
F-53B Major	ND		0.20	0.035	ug/Kg		05/30/22 12:03	06/02/22 16:09	1
HFPO-DA (GenX)	ND		0.20	0.041	ug/Kg		05/30/22 12:03	06/02/22 16:09	1
F-53B Minor	ND		0.20	0.031	ug/Kg		05/30/22 12:03	06/02/22 16:09	1
DONA	ND		0.20	0.039	ug/Kg		05/30/22 12:03	06/02/22 16:09	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	96		25 - 150	05/30/22 12:03	06/02/22 16:09	1
13C2 PFDA	91		25 - 150	05/30/22 12:03	06/02/22 16:09	1
d5-NEtFOSAA	81		25 - 150	05/30/22 12:03	06/02/22 16:09	1
13C3 HFPO-DA	95		25 - 150	05/30/22 12:03	06/02/22 16:09	1
13C4 PFOS	86		25 - 150	05/30/22 12:03	06/02/22 16:09	1
d3-NMeFOSAA	84		25 - 150	05/30/22 12:03	06/02/22 16:09	1
18O2 PFHxS	95		25 - 150	05/30/22 12:03	06/02/22 16:09	1
13C3 PFBS	87		25 - 150	05/30/22 12:03	06/02/22 16:09	1
13C2 PFDoA	82		25 - 150	05/30/22 12:03	06/02/22 16:09	1
13C2 PFTeDA	72		25 - 150	05/30/22 12:03	06/02/22 16:09	1
13C5 PFNA	89		25 - 150	05/30/22 12:03	06/02/22 16:09	1
13C4 PFOA	91		25 - 150	05/30/22 12:03	06/02/22 16:09	1
13C2 PFUnA	83		25 - 150	05/30/22 12:03	06/02/22 16:09	1
13C4 PFHpA	104		25 - 150	05/30/22 12:03	06/02/22 16:09	1

Lab Sample ID: LCS 320-591338/2-A

Matrix: Solid

Analysis Batch: 592050

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 591338

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Perfluorohexanoic acid (PFHxA)	2.00	1.81		ug/Kg		91	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	2.04		ug/Kg		102	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	2.04		ug/Kg		102	72 - 132
Perfluorononanoic acid (PFNA)	2.00	2.07		ug/Kg		103	73 - 133
Perfluorodecanoic acid (PFDA)	2.00	1.49		ug/Kg		75	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	2.21		ug/Kg		110	66 - 126

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-591338/2-A

Matrix: Solid

Analysis Batch: 592050

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 591338

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorododecanoic acid (PFDoA)	2.00	1.97		ug/Kg		98	71 - 131
Perfluorotridecanoic acid (PFTriA)	2.00	1.98		ug/Kg		99	71 - 131
Perfluorotetradecanoic acid (PFTeA)	2.00	2.06		ug/Kg		103	67 - 127
Perfluorobutanesulfonic acid (PFBS)	1.77	1.86		ug/Kg		105	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.69		ug/Kg		93	62 - 122
Perfluorooctanesulfonic acid (PFOS)	1.86	1.89		ug/Kg		102	68 - 141
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.00	2.01		ug/Kg		101	72 - 132
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.00	2.01		ug/Kg		101	72 - 132
F-53B Major	1.86	1.88		ug/Kg		101	74 - 134
HFPO-DA (GenX)	2.00	2.30		ug/Kg		115	53 - 158
F-53B Minor	1.88	1.80		ug/Kg		95	66 - 136
DONA	1.88	2.08		ug/Kg		110	79 - 139

Isotope Dilution	LCS		Limits
	%Recovery	Qualifier	
13C2 PFHxA	103		25 - 150
13C2 PFDA	89		25 - 150
d5-NEtFOSAA	81		25 - 150
13C3 HFPO-DA	85		25 - 150
13C4 PFOS	83		25 - 150
d3-NMeFOSAA	78		25 - 150
18O2 PFHxS	91		25 - 150
13C3 PFBS	81		25 - 150
13C2 PFDoA	80		25 - 150
13C2 PFTeDA	68		25 - 150
13C5 PFNA	90		25 - 150
13C4 PFOA	87		25 - 150
13C2 PFUnA	80		25 - 150
13C4 PFHpA	101		25 - 150

Lab Sample ID: MB 320-592016/1-A

Matrix: Solid

Analysis Batch: 592377

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 592016

Analyte	MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.031	ug/Kg		06/01/22 19:03	06/03/22 02:34	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.038	ug/Kg		06/01/22 19:03	06/03/22 02:34	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.053	ug/Kg		06/01/22 19:03	06/03/22 02:34	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.022	ug/Kg		06/01/22 19:03	06/03/22 02:34	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.048	ug/Kg		06/01/22 19:03	06/03/22 02:34	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.042	ug/Kg		06/01/22 19:03	06/03/22 02:34	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.030	ug/Kg		06/01/22 19:03	06/03/22 02:34	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.021	ug/Kg		06/01/22 19:03	06/03/22 02:34	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.037	ug/Kg		06/01/22 19:03	06/03/22 02:34	1

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-592016/1-A

Matrix: Solid

Analysis Batch: 592377

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 592016

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.038	ug/Kg		06/01/22 19:03	06/03/22 02:34	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.029	ug/Kg		06/01/22 19:03	06/03/22 02:34	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.20	0.043	ug/Kg		06/01/22 19:03	06/03/22 02:34	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.20	0.023	ug/Kg		06/01/22 19:03	06/03/22 02:34	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.20	0.048	ug/Kg		06/01/22 19:03	06/03/22 02:34	1
F-53B Major	ND		0.20	0.035	ug/Kg		06/01/22 19:03	06/03/22 02:34	1
HFPO-DA (GenX)	ND		0.20	0.041	ug/Kg		06/01/22 19:03	06/03/22 02:34	1
F-53B Minor	ND		0.20	0.031	ug/Kg		06/01/22 19:03	06/03/22 02:34	1
DONA	ND		0.20	0.039	ug/Kg		06/01/22 19:03	06/03/22 02:34	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	93		25 - 150	06/01/22 19:03	06/03/22 02:34	1
13C2 PFDA	99		25 - 150	06/01/22 19:03	06/03/22 02:34	1
d5-NEtFOSAA	118		25 - 150	06/01/22 19:03	06/03/22 02:34	1
13C3 HFPO-DA	94		25 - 150	06/01/22 19:03	06/03/22 02:34	1
13C4 PFOS	93		25 - 150	06/01/22 19:03	06/03/22 02:34	1
d3-NMeFOSAA	111		25 - 150	06/01/22 19:03	06/03/22 02:34	1
18O2 PFHxS	93		25 - 150	06/01/22 19:03	06/03/22 02:34	1
13C3 PFBS	103		25 - 150	06/01/22 19:03	06/03/22 02:34	1
13C2 PFDoA	104		25 - 150	06/01/22 19:03	06/03/22 02:34	1
13C2 PFTeDA	95		25 - 150	06/01/22 19:03	06/03/22 02:34	1
13C5 PFNA	96		25 - 150	06/01/22 19:03	06/03/22 02:34	1
13C4 PFOA	101		25 - 150	06/01/22 19:03	06/03/22 02:34	1
13C2 PFUnA	93		25 - 150	06/01/22 19:03	06/03/22 02:34	1
13C4 PFHpA	102		25 - 150	06/01/22 19:03	06/03/22 02:34	1

Lab Sample ID: LCS 320-592016/2-A

Matrix: Solid

Analysis Batch: 592377

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 592016

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Perfluorohexanoic acid (PFHxA)	2.00	1.94		ug/Kg		97	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	1.90		ug/Kg		95	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	1.96		ug/Kg		98	72 - 132
Perfluorononanoic acid (PFNA)	2.00	1.95		ug/Kg		98	73 - 133
Perfluorodecanoic acid (PFDA)	2.00	1.83		ug/Kg		92	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	1.77		ug/Kg		89	66 - 126
Perfluorododecanoic acid (PFDoA)	2.00	1.73		ug/Kg		86	71 - 131
Perfluorotridecanoic acid (PFTriA)	2.00	1.95		ug/Kg		98	71 - 131
Perfluorotetradecanoic acid (PFTeA)	2.00	1.88		ug/Kg		94	67 - 127
Perfluorobutanesulfonic acid (PFBS)	1.77	1.68		ug/Kg		95	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.63		ug/Kg		90	62 - 122

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-592016/2-A

Matrix: Solid

Analysis Batch: 592377

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 592016

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorooctanesulfonic acid (PFOS)	1.86	1.97		ug/Kg		106	68 - 141
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.00	1.71		ug/Kg		85	72 - 132
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.00	1.88		ug/Kg		94	72 - 132
F-53B Major	1.86	1.84		ug/Kg		99	74 - 134
HFPO-DA (GenX)	2.00	2.00		ug/Kg		100	53 - 158
F-53B Minor	1.88	2.01		ug/Kg		106	66 - 136
DONA	1.88	1.97		ug/Kg		105	79 - 139

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C2 PFHxA	96		25 - 150
13C2 PFDA	109		25 - 150
d5-NEtFOSAA	123		25 - 150
13C3 HFPO-DA	100		25 - 150
13C4 PFOS	95		25 - 150
d3-NMeFOSAA	113		25 - 150
18O2 PFHxS	103		25 - 150
13C3 PFBS	97		25 - 150
13C2 PFDoA	114		25 - 150
13C2 PFTeDA	99		25 - 150
13C5 PFNA	103		25 - 150
13C4 PFOA	98		25 - 150
13C2 PFUnA	105		25 - 150
13C4 PFHpA	111		25 - 150

Lab Sample ID: 320-88345-5 MS

Matrix: Solid

Analysis Batch: 592377

Client Sample ID: FP-P1:0.2

Prep Type: Total/NA

Prep Batch: 592016

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanoic acid (PFHxA)	0.057	J	2.14	2.28		ug/Kg	✱	104	71 - 131
Perfluoroheptanoic acid (PFHpA)	0.041	J	2.14	2.28		ug/Kg	✱	105	71 - 131
Perfluorooctanoic acid (PFOA)	ND		2.14	2.16		ug/Kg	✱	101	72 - 132
Perfluorononanoic acid (PFNA)	0.16	J	2.14	2.41		ug/Kg	✱	105	73 - 133
Perfluorodecanoic acid (PFDA)	ND		2.14	2.16		ug/Kg	✱	101	72 - 132
Perfluoroundecanoic acid (PFUnA)	ND		2.14	2.16		ug/Kg	✱	101	66 - 126
Perfluorododecanoic acid (PFDoA)	ND		2.14	2.02		ug/Kg	✱	94	71 - 131
Perfluorotridecanoic acid (PFTriA)	ND		2.14	2.15		ug/Kg	✱	101	71 - 131
Perfluorotetradecanoic acid (PFTeA)	ND		2.14	2.09		ug/Kg	✱	98	67 - 127
Perfluorobutanesulfonic acid (PFBS)	ND		1.89	2.07		ug/Kg	✱	109	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	0.032	J	1.95	1.86		ug/Kg	✱	94	62 - 122
Perfluorooctanesulfonic acid (PFOS)	0.35		1.98	2.98		ug/Kg	✱	133	68 - 141

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-88345-5 MS

Matrix: Solid

Analysis Batch: 592377

Client Sample ID: FP-P1:0.2

Prep Type: Total/NA

Prep Batch: 592016

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.14	1.96		ug/Kg	✱	92	72 - 132
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.14	1.97		ug/Kg	✱	92	72 - 132
F-53B Major	ND		1.99	2.10		ug/Kg	✱	106	74 - 134
HFPO-DA (GenX)	ND		2.14	2.10		ug/Kg	✱	98	53 - 158
F-53B Minor	ND		2.01	2.27		ug/Kg	✱	113	66 - 136
DONA	ND		2.01	2.20		ug/Kg	✱	109	79 - 139
MS MS									
Isotope Dilution	%Recovery	Qualifier	Limits						
13C2 PFHxA	93		25 - 150						
13C2 PFDA	105		25 - 150						
d5-NEtFOSAA	126		25 - 150						
13C3 HFPO-DA	96		25 - 150						
13C4 PFOS	88		25 - 150						
d3-NMeFOSAA	104		25 - 150						
18O2 PFHxS	92		25 - 150						
13C3 PFBS	83		25 - 150						
13C2 PFDoA	111		25 - 150						
13C2 PFTeDA	100		25 - 150						
13C5 PFNA	102		25 - 150						
13C4 PFOA	95		25 - 150						
13C2 PFUnA	100		25 - 150						
13C4 PFHpA	102		25 - 150						

Lab Sample ID: 320-88345-5 MSD

Matrix: Solid

Analysis Batch: 592377

Client Sample ID: FP-P1:0.2

Prep Type: Total/NA

Prep Batch: 592016

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	0.057	J	2.13	2.09		ug/Kg	✱	95	71 - 131	9	30
Perfluoroheptanoic acid (PFHpA)	0.041	J	2.13	2.04		ug/Kg	✱	94	71 - 131	11	30
Perfluorooctanoic acid (PFOA)	ND		2.13	2.01		ug/Kg	✱	94	72 - 132	7	30
Perfluorononanoic acid (PFNA)	0.16	J	2.13	2.51		ug/Kg	✱	110	73 - 133	4	30
Perfluorodecanoic acid (PFDA)	ND		2.13	2.24		ug/Kg	✱	105	72 - 132	4	30
Perfluoroundecanoic acid (PFUnA)	ND		2.13	2.14		ug/Kg	✱	100	66 - 126	1	30
Perfluorododecanoic acid (PFDoA)	ND		2.13	1.91		ug/Kg	✱	89	71 - 131	6	30
Perfluorotridecanoic acid (PFTriA)	ND		2.13	1.87		ug/Kg	✱	88	71 - 131	14	30
Perfluorotetradecanoic acid (PFTeA)	ND		2.13	2.05		ug/Kg	✱	96	67 - 127	2	30
Perfluorobutanesulfonic acid (PFBS)	ND		1.89	1.85		ug/Kg	✱	98	69 - 129	11	30
Perfluorohexanesulfonic acid (PFHxS)	0.032	J	1.94	1.88		ug/Kg	✱	95	62 - 122	1	30
Perfluorooctanesulfonic acid (PFOS)	0.35		1.98	2.72		ug/Kg	✱	120	68 - 141	9	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.13	1.92		ug/Kg	✱	90	72 - 132	2	30

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-88345-5 MSD

Matrix: Solid

Analysis Batch: 592377

Client Sample ID: FP-P1:0.2

Prep Type: Total/NA

Prep Batch: 592016

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.13	2.04		ug/Kg	✱	96	72 - 132	4	30
F-53B Major	ND		1.99	2.16		ug/Kg	✱	109	74 - 134	3	30
HFPO-DA (GenX)	ND		2.13	2.08		ug/Kg	✱	98	53 - 158	1	30
F-53B Minor	ND		2.01	2.03		ug/Kg	✱	101	66 - 136	11	30
DONA	ND		2.01	2.45		ug/Kg	✱	122	79 - 139	11	30

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C2 PFHxA	93		25 - 150
13C2 PFDA	92		25 - 150
d5-NEtFOSAA	109		25 - 150
13C3 HFPO-DA	89		25 - 150
13C4 PFOS	82		25 - 150
d3-NMeFOSAA	100		25 - 150
18O2 PFHxS	83		25 - 150
13C3 PFBS	82		25 - 150
13C2 PFDoA	108		25 - 150
13C2 PFTeDA	95		25 - 150
13C5 PFNA	96		25 - 150
13C4 PFOA	98		25 - 150
13C2 PFUnA	92		25 - 150
13C4 PFHpA	98		25 - 150

Lab Sample ID: MB 320-592017/1-A

Matrix: Solid

Analysis Batch: 592730

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 592017

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.031	ug/Kg		06/01/22 19:07	06/03/22 23:20	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.038	ug/Kg		06/01/22 19:07	06/03/22 23:20	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.053	ug/Kg		06/01/22 19:07	06/03/22 23:20	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.022	ug/Kg		06/01/22 19:07	06/03/22 23:20	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.048	ug/Kg		06/01/22 19:07	06/03/22 23:20	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.042	ug/Kg		06/01/22 19:07	06/03/22 23:20	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.030	ug/Kg		06/01/22 19:07	06/03/22 23:20	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.021	ug/Kg		06/01/22 19:07	06/03/22 23:20	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.037	ug/Kg		06/01/22 19:07	06/03/22 23:20	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.038	ug/Kg		06/01/22 19:07	06/03/22 23:20	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.029	ug/Kg		06/01/22 19:07	06/03/22 23:20	1
Perfluorooctanesulfonic acid (PFOS)	0.405		0.20	0.043	ug/Kg		06/01/22 19:07	06/03/22 23:20	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.20	0.023	ug/Kg		06/01/22 19:07	06/03/22 23:20	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.20	0.048	ug/Kg		06/01/22 19:07	06/03/22 23:20	1
F-53B Major	ND		0.20	0.035	ug/Kg		06/01/22 19:07	06/03/22 23:20	1
HFPO-DA (GenX)	ND		0.20	0.041	ug/Kg		06/01/22 19:07	06/03/22 23:20	1
F-53B Minor	ND		0.20	0.031	ug/Kg		06/01/22 19:07	06/03/22 23:20	1
DONA	ND		0.20	0.039	ug/Kg		06/01/22 19:07	06/03/22 23:20	1

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C2 PFHxA	91		25 - 150	06/01/22 19:07	06/03/22 23:20	1
13C2 PFDA	88		25 - 150	06/01/22 19:07	06/03/22 23:20	1
d5-NEtFOSAA	81		25 - 150	06/01/22 19:07	06/03/22 23:20	1
13C3 HFPO-DA	85		25 - 150	06/01/22 19:07	06/03/22 23:20	1
13C4 PFOS	84		25 - 150	06/01/22 19:07	06/03/22 23:20	1
d3-NMeFOSAA	76		25 - 150	06/01/22 19:07	06/03/22 23:20	1
18O2 PFHxS	91		25 - 150	06/01/22 19:07	06/03/22 23:20	1
13C3 PFBS	80		25 - 150	06/01/22 19:07	06/03/22 23:20	1
13C2 PFDoA	86		25 - 150	06/01/22 19:07	06/03/22 23:20	1
13C2 PFTeDA	80		25 - 150	06/01/22 19:07	06/03/22 23:20	1
13C5 PFNA	86		25 - 150	06/01/22 19:07	06/03/22 23:20	1
13C4 PFOA	87		25 - 150	06/01/22 19:07	06/03/22 23:20	1
13C2 PFUnA	78		25 - 150	06/01/22 19:07	06/03/22 23:20	1
13C4 PFHpA	97		25 - 150	06/01/22 19:07	06/03/22 23:20	1

Lab Sample ID: LCS 320-592017/2-A

Matrix: Solid

Analysis Batch: 592730

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 592017

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanoic acid (PFHxA)	2.00	1.87		ug/Kg		93	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	1.89		ug/Kg		94	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	2.01		ug/Kg		101	72 - 132
Perfluorononanoic acid (PFNA)	2.00	2.14		ug/Kg		107	73 - 133
Perfluorodecanoic acid (PFDA)	2.00	1.48		ug/Kg		74	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	2.16		ug/Kg		108	66 - 126
Perfluorododecanoic acid (PFDoA)	2.00	1.94		ug/Kg		97	71 - 131
Perfluorotridecanoic acid (PFTriA)	2.00	1.92		ug/Kg		96	71 - 131
Perfluorotetradecanoic acid (PFTeA)	2.00	1.89		ug/Kg		94	67 - 127
Perfluorobutanesulfonic acid (PFBS)	1.77	1.64		ug/Kg		93	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.63		ug/Kg		90	62 - 122
Perfluorooctanesulfonic acid (PFOS)	1.86	1.82		ug/Kg		98	68 - 141
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.00	1.97		ug/Kg		99	72 - 132
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.00	2.03		ug/Kg		101	72 - 132
F-53B Major	1.86	1.78		ug/Kg		96	74 - 134
HFPO-DA (GenX)	2.00	2.09		ug/Kg		104	53 - 158
F-53B Minor	1.88	1.89		ug/Kg		100	66 - 136
DONA	1.88	2.03		ug/Kg		108	79 - 139

Isotope Dilution	LCS LCS		Limits
	%Recovery	Qualifier	
13C2 PFHxA	90		25 - 150
13C2 PFDA	86		25 - 150
d5-NEtFOSAA	79		25 - 150
13C3 HFPO-DA	81		25 - 150
13C4 PFOS	82		25 - 150

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-592017/2-A

Matrix: Solid

Analysis Batch: 592730

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 592017

	LCS	LCS	
Isotope Dilution	%Recovery	Qualifier	Limits
d3-NMeFOSAA	75		25 - 150
18O2 PFHxS	86		25 - 150
13C3 PFBS	78		25 - 150
13C2 PFDoA	82		25 - 150
13C2 PFTeDA	73		25 - 150
13C5 PFNA	83		25 - 150
13C4 PFOA	83		25 - 150
13C2 PFUnA	77		25 - 150
13C4 PFHpA	95		25 - 150

Lab Sample ID: 320-88345-28 MS

Matrix: Solid

Analysis Batch: 592371

Client Sample ID: FP-P7:0.5

Prep Type: Total/NA

Prep Batch: 592017

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanoic acid (PFHxA)	0.63	F1	2.08	2.86		ug/Kg	✱	108	71 - 131
Perfluoroheptanoic acid (PFHpA)	0.14	J	2.08	2.46		ug/Kg	✱	112	71 - 131
Perfluorooctanoic acid (PFOA)	1.5	F1	2.08	4.09		ug/Kg	✱	127	72 - 132
Perfluorononanoic acid (PFNA)	6.7	F1	2.08	10.2	F1	ug/Kg	✱	167	73 - 133
Perfluorodecanoic acid (PFDA)	0.83		2.08	3.18		ug/Kg	✱	113	72 - 132
Perfluorododecanoic acid (PFDoA)	0.48		2.08	2.91		ug/Kg	✱	117	71 - 131
Perfluorotridecanoic acid (PFTriA)	11		2.08	19.6	4	ug/Kg	✱	418	71 - 131
Perfluorotetradecanoic acid (PFTeA)	0.32		2.08	2.44		ug/Kg	✱	102	67 - 127
Perfluorobutanesulfonic acid (PFBS)	0.26		1.84	2.48		ug/Kg	✱	121	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	10		1.89	17.0	4	ug/Kg	✱	361	62 - 122
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.13	J I	2.08	2.05		ug/Kg	✱	92	72 - 132
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.32		2.08	2.62		ug/Kg	✱	111	72 - 132
F-53B Major	ND	F1	1.93	4.18	F1	ug/Kg	✱	216	74 - 134
HFPO-DA (GenX)	ND		2.08	2.14		ug/Kg	✱	103	53 - 158
F-53B Minor	ND	F1	1.96	3.98	F1	ug/Kg	✱	203	66 - 136
DONA	ND	F1	1.96	4.17	F1	ug/Kg	✱	213	79 - 139
	MS	MS							
Isotope Dilution	%Recovery	Qualifier	Limits						
13C2 PFHxA	97		25 - 150						
13C2 PFDA	94		25 - 150						
d5-NEtFOSAA	92		25 - 150						
13C3 HFPO-DA	92		25 - 150						
13C4 PFOS	46		25 - 150						
d3-NMeFOSAA	108		25 - 150						
18O2 PFHxS	94		25 - 150						
13C3 PFBS	82		25 - 150						
13C2 PFDoA	101		25 - 150						
13C2 PFTeDA	98		25 - 150						
13C5 PFNA	49		25 - 150						

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-88345-28 MS

Matrix: Solid

Analysis Batch: 592371

Client Sample ID: FP-P7:0.5

Prep Type: Total/NA

Prep Batch: 592017

<i>Isotope Dilution</i>	<i>MS</i> <i>%Recovery</i>	<i>MS</i> <i>Qualifier</i>	<i>Limits</i>
13C4 PFOA	95		25 - 150
13C2 PFUnA	95		25 - 150
13C4 PFHpA	97		25 - 150

Lab Sample ID: 320-88345-28 MSD

Matrix: Solid

Analysis Batch: 592371

Client Sample ID: FP-P7:0.5

Prep Type: Total/NA

Prep Batch: 592017

<i>Analyte</i>	<i>Sample</i> <i>Result</i>	<i>Sample</i> <i>Qualifier</i>	<i>Spike</i> <i>Added</i>	<i>MSD</i> <i>Result</i>	<i>MSD</i> <i>Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec</i> <i>Limits</i>	<i>RPD</i>	<i>RPD</i> <i>Limit</i>
Perfluorohexanoic acid (PFHxA)	0.63	F1	2.04	3.40	F1	ug/Kg	⊛	135	71 - 131	17	30
Perfluoroheptanoic acid (PFHpA)	0.14	J	2.04	2.27		ug/Kg	⊛	104	71 - 131	8	30
Perfluorooctanoic acid (PFOA)	1.5	F1	2.04	5.18	F1	ug/Kg	⊛	182	72 - 132	24	30
Perfluorononanoic acid (PFNA)	6.7	F1	2.04	10.9	F1	ug/Kg	⊛	207	73 - 133	7	30
Perfluorodecanoic acid (PFDA)	0.83		2.04	3.25		ug/Kg	⊛	119	72 - 132	2	30
Perfluorododecanoic acid (PFDoA)	0.48		2.04	2.82		ug/Kg	⊛	114	71 - 131	3	30
Perfluorotridecanoic acid (PFTriA)	11		2.04	20.7	E 4	ug/Kg	⊛	481	71 - 131	6	30
Perfluorotetradecanoic acid (PFTeA)	0.32		2.04	2.35		ug/Kg	⊛	99	67 - 127	4	30
Perfluorobutanesulfonic acid (PFBS)	0.26		1.81	2.10		ug/Kg	⊛	102	69 - 129	16	30
Perfluorohexanesulfonic acid (PFHxS)	10		1.86	19.8	E 4	ug/Kg	⊛	519	62 - 122	15	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.13	J I	2.04	2.19		ug/Kg	⊛	100	72 - 132	7	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.32		2.04	2.39		ug/Kg	⊛	101	72 - 132	9	30
F-53B Major	ND	F1	1.91	3.89	F1	ug/Kg	⊛	204	74 - 134	7	30
HFPO-DA (GenX)	ND		2.04	2.03		ug/Kg	⊛	100	53 - 158	5	30
F-53B Minor	ND	F1	1.93	4.08	F1	ug/Kg	⊛	212	66 - 136	2	30
DONA	ND	F1	1.93	4.08	F1	ug/Kg	⊛	212	79 - 139	2	30

<i>Isotope Dilution</i>	<i>MSD</i> <i>%Recovery</i>	<i>MSD</i> <i>Qualifier</i>	<i>Limits</i>
13C2 PFHxA	115		25 - 150
13C2 PFDA	113		25 - 150
d5-NEtFOSAA	126		25 - 150
13C3 HFPO-DA	111		25 - 150
13C4 PFOS	53		25 - 150
d3-NMeFOSAA	117		25 - 150
18O2 PFHxS	103		25 - 150
13C3 PFBS	107		25 - 150
13C2 PFDoA	118		25 - 150
13C2 PFTeDA	110		25 - 150
13C5 PFNA	60		25 - 150
13C4 PFOA	107		25 - 150
13C2 PFUnA	112		25 - 150
13C4 PFHpA	120		25 - 150

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-592403/1-A

Matrix: Water

Analysis Batch: 593211

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 592403

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.58	ng/L		06/03/22 05:10	06/06/22 21:33	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.25	ng/L		06/03/22 05:10	06/06/22 21:33	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.85	ng/L		06/03/22 05:10	06/06/22 21:33	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.27	ng/L		06/03/22 05:10	06/06/22 21:33	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.31	ng/L		06/03/22 05:10	06/06/22 21:33	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		06/03/22 05:10	06/06/22 21:33	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.55	ng/L		06/03/22 05:10	06/06/22 21:33	1
Perfluorotridecanoic acid (PFTriA)	ND		2.0	1.3	ng/L		06/03/22 05:10	06/06/22 21:33	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.73	ng/L		06/03/22 05:10	06/06/22 21:33	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.20	ng/L		06/03/22 05:10	06/06/22 21:33	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.57	ng/L		06/03/22 05:10	06/06/22 21:33	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	0.54	ng/L		06/03/22 05:10	06/06/22 21:33	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		5.0	1.2	ng/L		06/03/22 05:10	06/06/22 21:33	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		5.0	1.3	ng/L		06/03/22 05:10	06/06/22 21:33	1
F-53B Major	ND		2.0	0.24	ng/L		06/03/22 05:10	06/06/22 21:33	1
HFPO-DA (GenX)	ND		4.0	1.5	ng/L		06/03/22 05:10	06/06/22 21:33	1
F-53B Minor	ND		2.0	0.32	ng/L		06/03/22 05:10	06/06/22 21:33	1
DONA	ND		2.0	0.40	ng/L		06/03/22 05:10	06/06/22 21:33	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	105		25 - 150	06/03/22 05:10	06/06/22 21:33	1
13C2 PFDA	92		25 - 150	06/03/22 05:10	06/06/22 21:33	1
d5-NEtFOSAA	96		25 - 150	06/03/22 05:10	06/06/22 21:33	1
13C3 HFPO-DA	95		25 - 150	06/03/22 05:10	06/06/22 21:33	1
13C4 PFOS	95		25 - 150	06/03/22 05:10	06/06/22 21:33	1
d3-NMeFOSAA	92		25 - 150	06/03/22 05:10	06/06/22 21:33	1
18O2 PFHxS	104		25 - 150	06/03/22 05:10	06/06/22 21:33	1
13C3 PFBS	104		25 - 150	06/03/22 05:10	06/06/22 21:33	1
13C2 PFDoA	90		25 - 150	06/03/22 05:10	06/06/22 21:33	1
13C2 PFTeDA	82		25 - 150	06/03/22 05:10	06/06/22 21:33	1
13C5 PFNA	97		25 - 150	06/03/22 05:10	06/06/22 21:33	1
13C4 PFOA	102		25 - 150	06/03/22 05:10	06/06/22 21:33	1
13C2 PFUnA	90		25 - 150	06/03/22 05:10	06/06/22 21:33	1
13C4 PFHpA	98		25 - 150	06/03/22 05:10	06/06/22 21:33	1

Lab Sample ID: LCS 320-592403/2-A

Matrix: Water

Analysis Batch: 593211

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 592403

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanoic acid (PFHxA)	40.0	36.0		ng/L		90	73 - 133
Perfluoroheptanoic acid (PFHpA)	40.0	37.1		ng/L		93	72 - 132
Perfluorooctanoic acid (PFOA)	40.0	39.7		ng/L		99	70 - 130
Perfluorononanoic acid (PFNA)	40.0	42.2		ng/L		106	75 - 135
Perfluorodecanoic acid (PFDA)	40.0	40.9		ng/L		102	76 - 136
Perfluoroundecanoic acid (PFUnA)	40.0	41.2		ng/L		103	68 - 128

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-592403/2-A

Matrix: Water

Analysis Batch: 593211

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 592403

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorododecanoic acid (PFDoA)	40.0	37.6		ng/L		94	71 - 131
Perfluorotridecanoic acid (PFTriA)	40.0	37.6		ng/L		94	71 - 131
Perfluorotetradecanoic acid (PFTeA)	40.0	36.4		ng/L		91	70 - 130
Perfluorobutanesulfonic acid (PFBS)	35.4	37.1		ng/L		105	67 - 127
Perfluorohexanesulfonic acid (PFHxS)	36.4	35.3		ng/L		97	59 - 119
Perfluorooctanesulfonic acid (PFOS)	37.1	36.9		ng/L		99	70 - 130
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	40.0	40.1		ng/L		100	76 - 136
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	40.0	39.3		ng/L		98	76 - 136
F-53B Major	37.3	41.3		ng/L		111	75 - 135
HFPO-DA (GenX)	40.0	45.9		ng/L		115	51 - 173
F-53B Minor	37.7	37.8		ng/L		100	54 - 114
DONA	37.7	42.7		ng/L		113	79 - 139

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C2 PFHxA	106		25 - 150
13C2 PFDA	95		25 - 150
d5-NEtFOSAA	94		25 - 150
13C3 HFPO-DA	97		25 - 150
13C4 PFOS	95		25 - 150
d3-NMeFOSAA	98		25 - 150
18O2 PFHxS	108		25 - 150
13C3 PFBS	105		25 - 150
13C2 PFDoA	97		25 - 150
13C2 PFTeDA	88		25 - 150
13C5 PFNA	91		25 - 150
13C4 PFOA	102		25 - 150
13C2 PFUnA	92		25 - 150
13C4 PFHpA	107		25 - 150

Lab Sample ID: LCSD 320-592403/3-A

Matrix: Water

Analysis Batch: 593211

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 592403

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
Perfluorohexanoic acid (PFHxA)	40.0	38.0		ng/L		95	73 - 133	5	30
Perfluoroheptanoic acid (PFHpA)	40.0	39.4		ng/L		98	72 - 132	6	30
Perfluorooctanoic acid (PFOA)	40.0	38.6		ng/L		97	70 - 130	3	30
Perfluorononanoic acid (PFNA)	40.0	39.9		ng/L		100	75 - 135	6	30
Perfluorodecanoic acid (PFDA)	40.0	38.4		ng/L		96	76 - 136	6	30
Perfluoroundecanoic acid (PFUnA)	40.0	40.3		ng/L		101	68 - 128	2	30
Perfluorododecanoic acid (PFDoA)	40.0	40.3		ng/L		101	71 - 131	7	30

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 320-592403/3-A

Matrix: Water

Analysis Batch: 593211

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 592403

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorotridecanoic acid (PFTriA)	40.0	42.0		ng/L		105	71 - 131	11	30
Perfluorotetradecanoic acid (PFTeA)	40.0	35.9		ng/L		90	70 - 130	1	30
Perfluorobutanesulfonic acid (PFBS)	35.4	36.8		ng/L		104	67 - 127	1	30
Perfluorohexanesulfonic acid (PFHxS)	36.4	35.0		ng/L		96	59 - 119	1	30
Perfluorooctanesulfonic acid (PFOS)	37.1	37.3		ng/L		100	70 - 130	1	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	40.0	40.4		ng/L		101	76 - 136	1	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	40.0	39.9		ng/L		100	76 - 136	2	30
F-53B Major	37.3	36.9		ng/L		99	75 - 135	11	30
HFPO-DA (GenX)	40.0	41.0		ng/L		102	51 - 173	11	30
F-53B Minor	37.7	37.0		ng/L		98	54 - 114	2	30
DONA	37.7	40.0		ng/L		106	79 - 139	7	30

Isotope Dilution	LCSD		Limits
	%Recovery	Qualifier	
13C2 PFHxA	94		25 - 150
13C2 PFDA	98		25 - 150
d5-NEtFOSAA	96		25 - 150
13C3 HFPO-DA	91		25 - 150
13C4 PFOS	93		25 - 150
d3-NMeFOSAA	93		25 - 150
18O2 PFHxS	94		25 - 150
13C3 PFBS	91		25 - 150
13C2 PFDoA	87		25 - 150
13C2 PFTeDA	78		25 - 150
13C5 PFNA	94		25 - 150
13C4 PFOA	93		25 - 150
13C2 PFUnA	89		25 - 150
13C4 PFHpA	91		25 - 150

Lab Sample ID: MB 320-592524/1-A

Matrix: Solid

Analysis Batch: 595997

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 592524

Analyte	MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.031	ug/Kg		06/03/22 11:31	06/15/22 18:38	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.038	ug/Kg		06/03/22 11:31	06/15/22 18:38	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.053	ug/Kg		06/03/22 11:31	06/15/22 18:38	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.022	ug/Kg		06/03/22 11:31	06/15/22 18:38	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.048	ug/Kg		06/03/22 11:31	06/15/22 18:38	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.042	ug/Kg		06/03/22 11:31	06/15/22 18:38	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.030	ug/Kg		06/03/22 11:31	06/15/22 18:38	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.021	ug/Kg		06/03/22 11:31	06/15/22 18:38	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.037	ug/Kg		06/03/22 11:31	06/15/22 18:38	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.038	ug/Kg		06/03/22 11:31	06/15/22 18:38	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.029	ug/Kg		06/03/22 11:31	06/15/22 18:38	1

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-592524/1-A

Matrix: Solid

Analysis Batch: 595997

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 592524

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	ND		0.20	0.043	ug/Kg		06/03/22 11:31	06/15/22 18:38	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.20	0.023	ug/Kg		06/03/22 11:31	06/15/22 18:38	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.20	0.048	ug/Kg		06/03/22 11:31	06/15/22 18:38	1
F-53B Major	ND		0.20	0.035	ug/Kg		06/03/22 11:31	06/15/22 18:38	1
HFPO-DA (GenX)	ND		0.20	0.041	ug/Kg		06/03/22 11:31	06/15/22 18:38	1
F-53B Minor	ND		0.20	0.031	ug/Kg		06/03/22 11:31	06/15/22 18:38	1
DONA	ND		0.20	0.039	ug/Kg		06/03/22 11:31	06/15/22 18:38	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	96		25 - 150	06/03/22 11:31	06/15/22 18:38	1
13C2 PFDA	97		25 - 150	06/03/22 11:31	06/15/22 18:38	1
d5-NEtFOSAA	80		25 - 150	06/03/22 11:31	06/15/22 18:38	1
13C3 HFPO-DA	94		25 - 150	06/03/22 11:31	06/15/22 18:38	1
13C4 PFOS	95		25 - 150	06/03/22 11:31	06/15/22 18:38	1
d3-NMeFOSAA	85		25 - 150	06/03/22 11:31	06/15/22 18:38	1
18O2 PFHxS	97		25 - 150	06/03/22 11:31	06/15/22 18:38	1
13C3 PFBS	90		25 - 150	06/03/22 11:31	06/15/22 18:38	1
13C2 PFDoA	85		25 - 150	06/03/22 11:31	06/15/22 18:38	1
13C2 PFTeDA	90		25 - 150	06/03/22 11:31	06/15/22 18:38	1
13C5 PFNA	102		25 - 150	06/03/22 11:31	06/15/22 18:38	1
13C4 PFOA	96		25 - 150	06/03/22 11:31	06/15/22 18:38	1
13C2 PFUnA	88		25 - 150	06/03/22 11:31	06/15/22 18:38	1
13C4 PFHpA	95		25 - 150	06/03/22 11:31	06/15/22 18:38	1

Lab Sample ID: LCS 320-592524/2-A

Matrix: Solid

Analysis Batch: 595997

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 592524

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Perfluorohexanoic acid (PFHxA)	2.00	2.16		ug/Kg		108	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	2.07		ug/Kg		104	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	2.20		ug/Kg		110	72 - 132
Perfluorononanoic acid (PFNA)	2.00	2.22		ug/Kg		111	73 - 133
Perfluorodecanoic acid (PFDA)	2.00	2.07		ug/Kg		103	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	2.15		ug/Kg		108	66 - 126
Perfluorododecanoic acid (PFDoA)	2.00	2.14		ug/Kg		107	71 - 131
Perfluorotridecanoic acid (PFTriA)	2.00	2.26		ug/Kg		113	71 - 131
Perfluorotetradecanoic acid (PFTeA)	2.00	2.11		ug/Kg		106	67 - 127
Perfluorobutanesulfonic acid (PFBS)	1.77	2.06		ug/Kg		116	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.92		ug/Kg		105	62 - 122
Perfluorooctanesulfonic acid (PFOS)	1.86	1.96		ug/Kg		105	68 - 141

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-592524/2-A

Matrix: Solid

Analysis Batch: 595997

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 592524

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.00	2.14		ug/Kg		107	72 - 132
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.00	2.24		ug/Kg		112	72 - 132
F-53B Major	1.86	1.75		ug/Kg		94	74 - 134
HFPO-DA (GenX)	2.00	2.30		ug/Kg		115	53 - 158
F-53B Minor	1.88	2.00		ug/Kg		106	66 - 136
DONA	1.88	2.11		ug/Kg		112	79 - 139

Isotope Dilution	LCS		Limits
	%Recovery	Qualifier	
13C2 PFHxA	90		25 - 150
13C2 PFDA	94		25 - 150
d5-NEtFOSAA	81		25 - 150
13C3 HFPO-DA	87		25 - 150
13C4 PFOS	97		25 - 150
d3-NMeFOSAA	86		25 - 150
18O2 PFHxS	96		25 - 150
13C3 PFBS	89		25 - 150
13C2 PFDoA	83		25 - 150
13C2 PFTeDA	90		25 - 150
13C5 PFNA	99		25 - 150
13C4 PFOA	91		25 - 150
13C2 PFUnA	87		25 - 150
13C4 PFHpA	97		25 - 150

Lab Sample ID: MB 320-593335/1-A

Matrix: Solid

Analysis Batch: 593229

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 593335

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.031	ug/Kg		06/06/22 19:06	06/07/22 10:03	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.038	ug/Kg		06/06/22 19:06	06/07/22 10:03	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.053	ug/Kg		06/06/22 19:06	06/07/22 10:03	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.022	ug/Kg		06/06/22 19:06	06/07/22 10:03	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.048	ug/Kg		06/06/22 19:06	06/07/22 10:03	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.042	ug/Kg		06/06/22 19:06	06/07/22 10:03	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.030	ug/Kg		06/06/22 19:06	06/07/22 10:03	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.021	ug/Kg		06/06/22 19:06	06/07/22 10:03	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.037	ug/Kg		06/06/22 19:06	06/07/22 10:03	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.038	ug/Kg		06/06/22 19:06	06/07/22 10:03	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.029	ug/Kg		06/06/22 19:06	06/07/22 10:03	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.20	0.043	ug/Kg		06/06/22 19:06	06/07/22 10:03	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		0.20	0.023	ug/Kg		06/06/22 19:06	06/07/22 10:03	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		0.20	0.048	ug/Kg		06/06/22 19:06	06/07/22 10:03	1
F-53B Major	ND		0.20	0.035	ug/Kg		06/06/22 19:06	06/07/22 10:03	1
HFPO-DA (GenX)	ND		0.20	0.041	ug/Kg		06/06/22 19:06	06/07/22 10:03	1
F-53B Minor	ND		0.20	0.031	ug/Kg		06/06/22 19:06	06/07/22 10:03	1
DONA	ND		0.20	0.039	ug/Kg		06/06/22 19:06	06/07/22 10:03	1

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C2 PFHxA	83		25 - 150	06/06/22 19:06	06/07/22 10:03	1
13C2 PFDA	78		25 - 150	06/06/22 19:06	06/07/22 10:03	1
d5-NEtFOSAA	87		25 - 150	06/06/22 19:06	06/07/22 10:03	1
13C3 HFPO-DA	79		25 - 150	06/06/22 19:06	06/07/22 10:03	1
13C4 PFOS	78		25 - 150	06/06/22 19:06	06/07/22 10:03	1
d3-NMeFOSAA	83		25 - 150	06/06/22 19:06	06/07/22 10:03	1
18O2 PFHxS	86		25 - 150	06/06/22 19:06	06/07/22 10:03	1
13C3 PFBS	84		25 - 150	06/06/22 19:06	06/07/22 10:03	1
13C2 PFDoA	76		25 - 150	06/06/22 19:06	06/07/22 10:03	1
13C2 PFTeDA	63		25 - 150	06/06/22 19:06	06/07/22 10:03	1
13C5 PFNA	79		25 - 150	06/06/22 19:06	06/07/22 10:03	1
13C4 PFOA	83		25 - 150	06/06/22 19:06	06/07/22 10:03	1
13C2 PFUnA	77		25 - 150	06/06/22 19:06	06/07/22 10:03	1
13C4 PFHpA	81		25 - 150	06/06/22 19:06	06/07/22 10:03	1

Lab Sample ID: LCS 320-593335/2-A

Matrix: Solid

Analysis Batch: 593229

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 593335

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanoic acid (PFHxA)	2.00	2.06		ug/Kg		103	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	2.13		ug/Kg		107	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	2.09		ug/Kg		105	72 - 132
Perfluorononanoic acid (PFNA)	2.00	2.13		ug/Kg		106	73 - 133
Perfluorodecanoic acid (PFDA)	2.00	2.20		ug/Kg		110	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	2.27		ug/Kg		113	66 - 126
Perfluorododecanoic acid (PFDoA)	2.00	1.99		ug/Kg		99	71 - 131
Perfluorotridecanoic acid (PFTriA)	2.00	2.02		ug/Kg		101	71 - 131
Perfluorotetradecanoic acid (PFTeA)	2.00	1.98		ug/Kg		99	67 - 127
Perfluorobutanesulfonic acid (PFBS)	1.77	2.00		ug/Kg		113	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.91		ug/Kg		105	62 - 122
Perfluorooctanesulfonic acid (PFOS)	1.86	2.15		ug/Kg		116	68 - 141
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.00	2.21		ug/Kg		110	72 - 132
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.00	2.10		ug/Kg		105	72 - 132
F-53B Major	1.86	2.12		ug/Kg		114	74 - 134
HFPO-DA (GenX)	2.00	2.19		ug/Kg		110	53 - 158
F-53B Minor	1.88	2.09		ug/Kg		111	66 - 136
DONA	1.88	2.36		ug/Kg		125	79 - 139

Isotope Dilution	LCS LCS		Limits
	%Recovery	Qualifier	
13C2 PFHxA	95		25 - 150
13C2 PFDA	87		25 - 150
d5-NEtFOSAA	94		25 - 150
13C3 HFPO-DA	95		25 - 150
13C4 PFOS	83		25 - 150

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-593335/2-A

Matrix: Solid

Analysis Batch: 593229

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 593335

Isotope Dilution	LCS		Limits
	%Recovery	Qualifier	
d3-NMeFOSAA	89		25 - 150
18O2 PFHxS	96		25 - 150
13C3 PFBS	96		25 - 150
13C2 PFDoA	84		25 - 150
13C2 PFTeDA	66		25 - 150
13C5 PFNA	88		25 - 150
13C4 PFOA	91		25 - 150
13C2 PFUnA	82		25 - 150
13C4 PFHpA	93		25 - 150

Lab Sample ID: 320-88345-33 MS

Matrix: Solid

Analysis Batch: 593229

Client Sample ID: FP-P8:6.3

Prep Type: Total/NA

Prep Batch: 593335

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec		
	Result	Qualifier	Added	Result	Qualifier				Limits		
Perfluorohexanoic acid (PFHxA)	0.17	J	2.26	2.49		ug/Kg	☼	103	71 - 131		
Perfluoroheptanoic acid (PFHpA)	0.090	J	2.26	2.41		ug/Kg	☼	103	71 - 131		
Perfluorooctanoic acid (PFOA)	0.31		2.26	2.67		ug/Kg	☼	105	72 - 132		
Perfluorononanoic acid (PFNA)	0.049	J	2.26	2.50		ug/Kg	☼	109	73 - 133		
Perfluorodecanoic acid (PFDA)	ND		2.26	2.46		ug/Kg	☼	109	72 - 132		
Perfluoroundecanoic acid (PFUnA)	ND		2.26	2.42		ug/Kg	☼	107	66 - 126		
Perfluorododecanoic acid (PFDoA)	ND		2.26	2.23		ug/Kg	☼	99	71 - 131		
Perfluorotridecanoic acid (PFTriA)	ND		2.26	2.39		ug/Kg	☼	106	71 - 131		
Perfluorotetradecanoic acid (PFTeA)	ND		2.26	2.29		ug/Kg	☼	102	67 - 127		
Perfluorobutanesulfonic acid (PFBS)	ND		2.00	2.21		ug/Kg	☼	111	69 - 129		
Perfluorohexanesulfonic acid (PFHxS)	0.22		2.06	2.38		ug/Kg	☼	105	62 - 122		
Perfluorooctanesulfonic acid (PFOS)	1.2		2.10	3.39		ug/Kg	☼	104	68 - 141		
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.26	2.46		ug/Kg	☼	109	72 - 132		
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.26	2.58		ug/Kg	☼	114	72 - 132		
F-53B Major	ND		2.11	2.21		ug/Kg	☼	105	74 - 134		
HFPO-DA (GenX)	ND		2.26	2.67		ug/Kg	☼	118	53 - 158		
F-53B Minor	ND		2.13	2.13		ug/Kg	☼	100	66 - 136		
DONA	ND		2.13	2.48		ug/Kg	☼	116	79 - 139		
	MS	MS									
Isotope Dilution	%Recovery	Qualifier	Limits								
13C2 PFHxA	92		25 - 150								
13C2 PFDA	88		25 - 150								
d5-NEtFOSAA	86		25 - 150								
13C3 HFPO-DA	90		25 - 150								
13C4 PFOS	86		25 - 150								
d3-NMeFOSAA	89		25 - 150								
18O2 PFHxS	97		25 - 150								

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-88345-33 MS

Matrix: Solid

Analysis Batch: 593229

Client Sample ID: FP-P8:6.3

Prep Type: Total/NA

Prep Batch: 593335

<i>Isotope Dilution</i>	<i>MS</i> <i>%Recovery</i>	<i>MS</i> <i>Qualifier</i>	<i>Limits</i>
13C3 PFBS	91		25 - 150
13C2 PFDoA	85		25 - 150
13C2 PFTeDA	72		25 - 150
13C5 PFNA	90		25 - 150
13C4 PFOA	92		25 - 150
13C2 PFUnA	86		25 - 150
13C4 PFHpA	94		25 - 150

Lab Sample ID: 320-88345-33 MSD

Matrix: Solid

Analysis Batch: 593229

Client Sample ID: FP-P8:6.3

Prep Type: Total/NA

Prep Batch: 593335

<i>Analyte</i>	<i>Sample</i> <i>Result</i>	<i>Sample</i> <i>Qualifier</i>	<i>Spike</i> <i>Added</i>	<i>MSD</i> <i>Result</i>	<i>MSD</i> <i>Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec</i> <i>Limits</i>	<i>RPD</i>	<i>RPD</i> <i>Limit</i>
Perfluorohexanoic acid (PFHxA)	0.17	J	2.07	2.29		ug/Kg	✱	102	71 - 131	9	30
Perfluoroheptanoic acid (PFHpA)	0.090	J	2.07	2.24		ug/Kg	✱	104	71 - 131	7	30
Perfluorooctanoic acid (PFOA)	0.31		2.07	2.45		ug/Kg	✱	103	72 - 132	9	30
Perfluorononanoic acid (PFNA)	0.049	J	2.07	2.30		ug/Kg	✱	108	73 - 133	9	30
Perfluorodecanoic acid (PFDA)	ND		2.07	2.30		ug/Kg	✱	111	72 - 132	7	30
Perfluoroundecanoic acid (PFUnA)	ND		2.07	2.27		ug/Kg	✱	109	66 - 126	6	30
Perfluorododecanoic acid (PFDoA)	ND		2.07	2.06		ug/Kg	✱	100	71 - 131	8	30
Perfluorotridecanoic acid (PFTriA)	ND		2.07	2.10		ug/Kg	✱	101	71 - 131	13	30
Perfluorotetradecanoic acid (PFTeA)	ND		2.07	2.07		ug/Kg	✱	100	67 - 127	10	30
Perfluorobutanesulfonic acid (PFBS)	ND		1.83	2.03		ug/Kg	✱	111	69 - 129	9	30
Perfluorohexanesulfonic acid (PFHxS)	0.22		1.89	2.31		ug/Kg	✱	111	62 - 122	3	30
Perfluorooctanesulfonic acid (PFOS)	1.2		1.92	3.29		ug/Kg	✱	108	68 - 141	3	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.07	2.24		ug/Kg	✱	108	72 - 132	10	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.07	2.36		ug/Kg	✱	114	72 - 132	9	30
F-53B Major	ND		1.93	2.13		ug/Kg	✱	110	74 - 134	4	30
HFPO-DA (GenX)	ND		2.07	2.48		ug/Kg	✱	120	53 - 158	7	30
F-53B Minor	ND		1.95	2.13		ug/Kg	✱	109	66 - 136	0	30
DONA	ND		1.95	2.42		ug/Kg	✱	124	79 - 139	2	30

<i>Isotope Dilution</i>	<i>MSD</i> <i>%Recovery</i>	<i>MSD</i> <i>Qualifier</i>	<i>Limits</i>
13C2 PFHxA	88		25 - 150
13C2 PFDA	81		25 - 150
d5-NEtFOSAA	87		25 - 150
13C3 HFPO-DA	82		25 - 150
13C4 PFOS	80		25 - 150
d3-NMeFOSAA	79		25 - 150
18O2 PFHxS	87		25 - 150
13C3 PFBS	85		25 - 150
13C2 PFDoA	83		25 - 150

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-88345-33 MSD

Matrix: Solid

Analysis Batch: 593229

Client Sample ID: FP-P8:6.3

Prep Type: Total/NA

Prep Batch: 593335

	MSD	MSD	
Isotope Dilution	%Recovery	Qualifier	Limits
13C2 PFTeDA	66		25 - 150
13C5 PFNA	86		25 - 150
13C4 PFOA	89		25 - 150
13C2 PFUnA	79		25 - 150
13C4 PFHpA	90		25 - 150

Method: 537 (modified) - Fluorinated Alkyl Substances - DL

Lab Sample ID: 320-88345-28 MS

Matrix: Solid

Analysis Batch: 592730

Client Sample ID: FP-P7:0.5

Prep Type: Total/NA

Prep Batch: 592017

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluoroundecanoic acid (PFUnA) - DL	29		2.08	34.7	4	ug/Kg	✱	254	66 - 126
Perfluorooctanesulfonic acid (PFOS) - DL	820	B	1.93	954	4	ug/Kg	✱	6819	68 - 141
Isotope Dilution	MS	MS							
	%Recovery	Qualifier	Limits						
13C4 PFOS - DL	93		25 - 150						
13C2 PFUnA - DL	105		25 - 150						

Lab Sample ID: 320-88345-28 MSD

Matrix: Solid

Analysis Batch: 592730

Client Sample ID: FP-P7:0.5

Prep Type: Total/NA

Prep Batch: 592017

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluoroundecanoic acid (PFUnA) - DL	29		2.04	33.3	4	ug/Kg	✱	187	66 - 126	4	30
Perfluorooctanesulfonic acid (PFOS) - DL	820	B	1.90	783	4	ug/Kg	✱	-2075	68 - 141	20	30
Isotope Dilution	MSD	MSD									
	%Recovery	Qualifier	Limits								
13C4 PFOS - DL	109		25 - 150								
13C2 PFUnA - DL	100		25 - 150								

Method: D 2216 - Percent Moisture

Lab Sample ID: 320-88345-1 DU

Matrix: Solid

Analysis Batch: 590962

Client Sample ID: FP-P9:0.5

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	9.5		9.2		%		3	20
Percent Solids	90.5		90.8		%		0.3	20

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method: D 2216 - Percent Moisture (Continued)

Lab Sample ID: 320-88345-33 DU

Matrix: Solid

Analysis Batch: 591015

Client Sample ID: FP-P8:6.3

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	12.3		13.1		%		6	20
Percent Solids	87.7		86.9		%		0.9	20

QC Association Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

LCMS

Prep Batch: 591338

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-1 - DL	FP-P9:0.5	Total/NA	Solid	SHAKE	
320-88345-1	FP-P9:0.5	Total/NA	Solid	SHAKE	
320-88345-2 - DL	FP-P9:6.5	Total/NA	Solid	SHAKE	
320-88345-2	FP-P9:6.5	Total/NA	Solid	SHAKE	
MB 320-591338/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-591338/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	

Prep Batch: 592016

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-5	FP-P1:0.2	Total/NA	Solid	SHAKE	
320-88345-6	FP-P1:10.2	Total/NA	Solid	SHAKE	
320-88345-8	FP-P2:0.2	Total/NA	Solid	SHAKE	
320-88345-9	FP-P2:5.3	Total/NA	Solid	SHAKE	
320-88345-9 - DL	FP-P2:5.3	Total/NA	Solid	SHAKE	
320-88345-12	FP-P3:1.2	Total/NA	Solid	SHAKE	
320-88345-13	FP-P3:6.3	Total/NA	Solid	SHAKE	
320-88345-15	FP-SH1:0.5	Total/NA	Solid	SHAKE	
320-88345-17	FP-P4:1.4	Total/NA	Solid	SHAKE	
320-88345-18	FP-P4:11.6	Total/NA	Solid	SHAKE	
320-88345-21	FP-SH2:0.5	Total/NA	Solid	SHAKE	
320-88345-22	FP-P5:0.5	Total/NA	Solid	SHAKE	
320-88345-23	FP-P5:7.5	Total/NA	Solid	SHAKE	
320-88345-25 - DL	FP-P6:0.5	Total/NA	Solid	SHAKE	
320-88345-25	FP-P6:0.5	Total/NA	Solid	SHAKE	
320-88345-26	FP-P6:3.4	Total/NA	Solid	SHAKE	
MB 320-592016/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-592016/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-88345-5 MS	FP-P1:0.2	Total/NA	Solid	SHAKE	
320-88345-5 MSD	FP-P1:0.2	Total/NA	Solid	SHAKE	

Prep Batch: 592017

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-28	FP-P7:0.5	Total/NA	Solid	SHAKE	
320-88345-28 - DL	FP-P7:0.5	Total/NA	Solid	SHAKE	
320-88345-29	FP-P7:7.0	Total/NA	Solid	SHAKE	
320-88345-29 - DL	FP-P7:7.0	Total/NA	Solid	SHAKE	
320-88345-31	FP-P100:0.5	Total/NA	Solid	SHAKE	
320-88345-31 - DL	FP-P100:0.5	Total/NA	Solid	SHAKE	
320-88345-32	FP-P8:1.5	Total/NA	Solid	SHAKE	
320-88345-35 - DL	FP-P101:1.5	Total/NA	Solid	SHAKE	
320-88345-35	FP-P101:1.5	Total/NA	Solid	SHAKE	
320-88345-37	FP-MW1:7.6	Total/NA	Solid	SHAKE	
320-88345-37 - DL	FP-MW1:7.6	Total/NA	Solid	SHAKE	
MB 320-592017/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-592017/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-88345-28 MS	FP-P7:0.5	Total/NA	Solid	SHAKE	
320-88345-28 MS - DL	FP-P7:0.5	Total/NA	Solid	SHAKE	
320-88345-28 MSD	FP-P7:0.5	Total/NA	Solid	SHAKE	
320-88345-28 MSD - DL	FP-P7:0.5	Total/NA	Solid	SHAKE	

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QC Association Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

LCMS

Analysis Batch: 592050

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-1	FP-P9:0.5	Total/NA	Solid	537 (modified)	591338
320-88345-2	FP-P9:6.5	Total/NA	Solid	537 (modified)	591338
MB 320-591338/1-A	Method Blank	Total/NA	Solid	537 (modified)	591338
LCS 320-591338/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	591338

Analysis Batch: 592371

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-28	FP-P7:0.5	Total/NA	Solid	537 (modified)	592017
320-88345-29	FP-P7:7.0	Total/NA	Solid	537 (modified)	592017
320-88345-31	FP-P100:0.5	Total/NA	Solid	537 (modified)	592017
320-88345-32	FP-P8:1.5	Total/NA	Solid	537 (modified)	592017
320-88345-35	FP-P101:1.5	Total/NA	Solid	537 (modified)	592017
320-88345-37	FP-MW1:7.6	Total/NA	Solid	537 (modified)	592017
320-88345-28 MS	FP-P7:0.5	Total/NA	Solid	537 (modified)	592017
320-88345-28 MSD	FP-P7:0.5	Total/NA	Solid	537 (modified)	592017

Analysis Batch: 592377

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-5	FP-P1:0.2	Total/NA	Solid	537 (modified)	592016
320-88345-6	FP-P1:10.2	Total/NA	Solid	537 (modified)	592016
320-88345-8	FP-P2:0.2	Total/NA	Solid	537 (modified)	592016
320-88345-9	FP-P2:5.3	Total/NA	Solid	537 (modified)	592016
320-88345-12	FP-P3:1.2	Total/NA	Solid	537 (modified)	592016
320-88345-13	FP-P3:6.3	Total/NA	Solid	537 (modified)	592016
320-88345-15	FP-SH1:0.5	Total/NA	Solid	537 (modified)	592016
320-88345-17	FP-P4:1.4	Total/NA	Solid	537 (modified)	592016
320-88345-18	FP-P4:11.6	Total/NA	Solid	537 (modified)	592016
320-88345-21	FP-SH2:0.5	Total/NA	Solid	537 (modified)	592016
320-88345-22	FP-P5:0.5	Total/NA	Solid	537 (modified)	592016
320-88345-23	FP-P5:7.5	Total/NA	Solid	537 (modified)	592016
320-88345-25	FP-P6:0.5	Total/NA	Solid	537 (modified)	592016
320-88345-26	FP-P6:3.4	Total/NA	Solid	537 (modified)	592016
MB 320-592016/1-A	Method Blank	Total/NA	Solid	537 (modified)	592016
LCS 320-592016/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	592016
320-88345-5 MS	FP-P1:0.2	Total/NA	Solid	537 (modified)	592016
320-88345-5 MSD	FP-P1:0.2	Total/NA	Solid	537 (modified)	592016

Prep Batch: 592403

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-4	FP-P9:GW	Total/NA	Water	3535	
320-88345-11 - DL	FP-P2:GW	Total/NA	Water	3535	
320-88345-11	FP-P2:GW	Total/NA	Water	3535	
320-88345-16 - DL	FP-P3:GW	Total/NA	Water	3535	
320-88345-16 - DL2	FP-P3:GW	Total/NA	Water	3535	
320-88345-16	FP-P3:GW	Total/NA	Water	3535	
320-88345-20 - DL	FP-P4:GW	Total/NA	Water	3535	
320-88345-20	FP-P4:GW	Total/NA	Water	3535	
MB 320-592403/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-592403/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-592403/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

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QC Association Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

LCMS

Prep Batch: 592524

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-36	FP-MW1:0.4	Total/NA	Solid	SHAKE	
320-88345-39	FP-MW100:0.4	Total/NA	Solid	SHAKE	
320-88345-40	FP-MW2:0.5	Total/NA	Solid	SHAKE	
320-88345-41	FP-MW2:7.0	Total/NA	Solid	SHAKE	
320-88345-43	FP-MW101:0.5	Total/NA	Solid	SHAKE	
320-88345-44	FP-HA1:0.8	Total/NA	Solid	SHAKE	
320-88345-45	FP-HA1:4.0	Total/NA	Solid	SHAKE	
320-88345-46	FP-MW3:0.5	Total/NA	Solid	SHAKE	
320-88345-47	FP-MW3:2.7	Total/NA	Solid	SHAKE	
320-88345-49	FP-MW102:0.5	Total/NA	Solid	SHAKE	
MB 320-592524/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-592524/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	

Analysis Batch: 592588

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-9 - DL	FP-P2:5.3	Total/NA	Solid	537 (modified)	592016
320-88345-25 - DL	FP-P6:0.5	Total/NA	Solid	537 (modified)	592016

Analysis Batch: 592730

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-28 - DL	FP-P7:0.5	Total/NA	Solid	537 (modified)	592017
320-88345-29 - DL	FP-P7:7.0	Total/NA	Solid	537 (modified)	592017
320-88345-31 - DL	FP-P100:0.5	Total/NA	Solid	537 (modified)	592017
320-88345-37 - DL	FP-MW1:7.6	Total/NA	Solid	537 (modified)	592017
MB 320-592017/1-A	Method Blank	Total/NA	Solid	537 (modified)	592017
LCS 320-592017/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	592017
320-88345-28 MS - DL	FP-P7:0.5	Total/NA	Solid	537 (modified)	592017
320-88345-28 MSD - DL	FP-P7:0.5	Total/NA	Solid	537 (modified)	592017

Analysis Batch: 592948

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-2 - DL	FP-P9:6.5	Total/NA	Solid	537 (modified)	591338

Analysis Batch: 592951

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-35 - DL	FP-P101:1.5	Total/NA	Solid	537 (modified)	592017

Analysis Batch: 593211

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-4	FP-P9:GW	Total/NA	Water	537 (modified)	592403
320-88345-11	FP-P2:GW	Total/NA	Water	537 (modified)	592403
320-88345-16	FP-P3:GW	Total/NA	Water	537 (modified)	592403
320-88345-20	FP-P4:GW	Total/NA	Water	537 (modified)	592403
MB 320-592403/1-A	Method Blank	Total/NA	Water	537 (modified)	592403
LCS 320-592403/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	592403
LCSD 320-592403/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	592403

Analysis Batch: 593229

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-33	FP-P8:6.3	Total/NA	Solid	537 (modified)	593335
MB 320-593335/1-A	Method Blank	Total/NA	Solid	537 (modified)	593335

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QC Association Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

LCMS (Continued)

Analysis Batch: 593229 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 320-593335/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	593335
320-88345-33 MS	FP-P8:6.3	Total/NA	Solid	537 (modified)	593335
320-88345-33 MSD	FP-P8:6.3	Total/NA	Solid	537 (modified)	593335

Prep Batch: 593335

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-33	FP-P8:6.3	Total/NA	Solid	SHAKE	
MB 320-593335/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-593335/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-88345-33 MS	FP-P8:6.3	Total/NA	Solid	SHAKE	
320-88345-33 MSD	FP-P8:6.3	Total/NA	Solid	SHAKE	

Analysis Batch: 593512

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-1 - DL	FP-P9:0.5	Total/NA	Solid	537 (modified)	591338

Analysis Batch: 594581

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-11 - DL	FP-P2:GW	Total/NA	Water	537 (modified)	592403
320-88345-16 - DL	FP-P3:GW	Total/NA	Water	537 (modified)	592403
320-88345-20 - DL	FP-P4:GW	Total/NA	Water	537 (modified)	592403

Analysis Batch: 595997

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-36	FP-MW1:0.4	Total/NA	Solid	537 (modified)	592524
320-88345-39	FP-MW100:0.4	Total/NA	Solid	537 (modified)	592524
320-88345-40	FP-MW2:0.5	Total/NA	Solid	537 (modified)	592524
320-88345-41	FP-MW2:7.0	Total/NA	Solid	537 (modified)	592524
320-88345-43	FP-MW101:0.5	Total/NA	Solid	537 (modified)	592524
320-88345-44	FP-HA1:0.8	Total/NA	Solid	537 (modified)	592524
320-88345-45	FP-HA1:4.0	Total/NA	Solid	537 (modified)	592524
320-88345-46	FP-MW3:0.5	Total/NA	Solid	537 (modified)	592524
320-88345-47	FP-MW3:2.7	Total/NA	Solid	537 (modified)	592524
320-88345-49	FP-MW102:0.5	Total/NA	Solid	537 (modified)	592524
MB 320-592524/1-A	Method Blank	Total/NA	Solid	537 (modified)	592524
LCS 320-592524/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	592524

Analysis Batch: 596777

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-16 - DL2	FP-P3:GW	Total/NA	Water	537 (modified)	592403

General Chemistry

Analysis Batch: 590941

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-37	FP-MW1:7.6	Total/NA	Solid	D 2216	
320-88345-39	FP-MW100:0.4	Total/NA	Solid	D 2216	
320-88345-40	FP-MW2:0.5	Total/NA	Solid	D 2216	
320-88345-41	FP-MW2:7.0	Total/NA	Solid	D 2216	
320-88345-43	FP-MW101:0.5	Total/NA	Solid	D 2216	
320-88345-44	FP-HA1:0.8	Total/NA	Solid	D 2216	

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QC Association Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

General Chemistry (Continued)

Analysis Batch: 590941 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-45	FP-HA1:4.0	Total/NA	Solid	D 2216	
320-88345-46	FP-MW3:0.5	Total/NA	Solid	D 2216	
320-88345-47	FP-MW3:2.7	Total/NA	Solid	D 2216	
320-88345-49	FP-MW102:0.5	Total/NA	Solid	D 2216	

Analysis Batch: 590962

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-1	FP-P9:0.5	Total/NA	Solid	D 2216	
320-88345-2	FP-P9:6.5	Total/NA	Solid	D 2216	
320-88345-5	FP-P1:0.2	Total/NA	Solid	D 2216	
320-88345-6	FP-P1:10.2	Total/NA	Solid	D 2216	
320-88345-8	FP-P2:0.2	Total/NA	Solid	D 2216	
320-88345-9	FP-P2:5.3	Total/NA	Solid	D 2216	
320-88345-12	FP-P3:1.2	Total/NA	Solid	D 2216	
320-88345-13	FP-P3:6.3	Total/NA	Solid	D 2216	
320-88345-15	FP-SH1:0.5	Total/NA	Solid	D 2216	
320-88345-17	FP-P4:1.4	Total/NA	Solid	D 2216	
320-88345-18	FP-P4:11.6	Total/NA	Solid	D 2216	
320-88345-21	FP-SH2:0.5	Total/NA	Solid	D 2216	
320-88345-22	FP-P5:0.5	Total/NA	Solid	D 2216	
320-88345-23	FP-P5:7.5	Total/NA	Solid	D 2216	
320-88345-25	FP-P6:0.5	Total/NA	Solid	D 2216	
320-88345-26	FP-P6:3.4	Total/NA	Solid	D 2216	
320-88345-28	FP-P7:0.5	Total/NA	Solid	D 2216	
320-88345-29	FP-P7:7.0	Total/NA	Solid	D 2216	
320-88345-31	FP-P100:0.5	Total/NA	Solid	D 2216	
320-88345-32	FP-P8:1.5	Total/NA	Solid	D 2216	
320-88345-1 DU	FP-P9:0.5	Total/NA	Solid	D 2216	

Analysis Batch: 591015

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88345-33	FP-P8:6.3	Total/NA	Solid	D 2216	
320-88345-35	FP-P101:1.5	Total/NA	Solid	D 2216	
320-88345-36	FP-MW1:0.4	Total/NA	Solid	D 2216	
320-88345-33 DU	FP-P8:6.3	Total/NA	Solid	D 2216	

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P9:0.5

Date Collected: 05/23/22 09:35

Date Received: 05/26/22 09:35

Lab Sample ID: 320-88345-1

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590962	05/27/22 10:41	TCS	TAL SAC

Client Sample ID: FP-P9:0.5

Date Collected: 05/23/22 09:35

Date Received: 05/26/22 09:35

Lab Sample ID: 320-88345-1

Matrix: Solid

Percent Solids: 90.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE	DL		5.18 g	10.0 mL	591338	05/30/22 12:03	FX	TAL SAC
Total/NA	Analysis	537 (modified)	DL	10			593512	06/08/22 06:53	RS1	TAL SAC
Total/NA	Prep	SHAKE			5.18 g	10.0 mL	591338	05/30/22 12:03	FX	TAL SAC
Total/NA	Analysis	537 (modified)		1			592050	06/02/22 17:30	K1S	TAL SAC

Client Sample ID: FP-P9:6.5

Date Collected: 05/23/22 09:40

Date Received: 05/26/22 09:35

Lab Sample ID: 320-88345-2

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590962	05/27/22 10:41	TCS	TAL SAC

Client Sample ID: FP-P9:6.5

Date Collected: 05/23/22 09:40

Date Received: 05/26/22 09:35

Lab Sample ID: 320-88345-2

Matrix: Solid

Percent Solids: 82.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE	DL		5.06 g	10.0 mL	591338	05/30/22 12:03	FX	TAL SAC
Total/NA	Analysis	537 (modified)	DL	10			592948	06/05/22 18:38	RS1	TAL SAC
Total/NA	Prep	SHAKE			5.06 g	10.0 mL	591338	05/30/22 12:03	FX	TAL SAC
Total/NA	Analysis	537 (modified)		1			592050	06/02/22 17:40	K1S	TAL SAC

Client Sample ID: FP-P9:GW

Date Collected: 05/23/22 10:00

Date Received: 05/26/22 09:35

Lab Sample ID: 320-88345-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			280.5 mL	10.0 mL	592403	06/03/22 05:10	EFG	TAL SAC
Total/NA	Analysis	537 (modified)		1			593211	06/06/22 22:25	K1S	TAL SAC

Client Sample ID: FP-P1:0.2

Date Collected: 05/23/22 11:30

Date Received: 05/26/22 09:35

Lab Sample ID: 320-88345-5

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590962	05/27/22 10:41	TCS	TAL SAC

Eurofins Sacramento

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P1:0.2

Lab Sample ID: 320-88345-5

Date Collected: 05/23/22 11:30

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 88.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.20 g	10.0 mL	592016	06/01/22 19:03	AM	TAL SAC
Total/NA	Analysis	537 (modified)		1			592377	06/03/22 02:54	S1M	TAL SAC

Client Sample ID: FP-P1:10.2

Lab Sample ID: 320-88345-6

Date Collected: 05/23/22 11:35

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590962	05/27/22 10:41	TCS	TAL SAC

Client Sample ID: FP-P1:10.2

Lab Sample ID: 320-88345-6

Date Collected: 05/23/22 11:35

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 76.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.41 g	10.0 mL	592016	06/01/22 19:03	AM	TAL SAC
Total/NA	Analysis	537 (modified)		1			592377	06/03/22 03:24	S1M	TAL SAC

Client Sample ID: FP-P2:0.2

Lab Sample ID: 320-88345-8

Date Collected: 05/23/22 12:10

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590962	05/27/22 10:41	TCS	TAL SAC

Client Sample ID: FP-P2:0.2

Lab Sample ID: 320-88345-8

Date Collected: 05/23/22 12:10

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 94.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.30 g	10.0 mL	592016	06/01/22 19:03	AM	TAL SAC
Total/NA	Analysis	537 (modified)		1			592377	06/03/22 03:45	S1M	TAL SAC

Client Sample ID: FP-P2:5.3

Lab Sample ID: 320-88345-9

Date Collected: 05/23/22 12:15

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590962	05/27/22 10:41	TCS	TAL SAC

Eurofins Sacramento

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P2:5.3

Lab Sample ID: 320-88345-9

Date Collected: 05/23/22 12:15

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 83.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.54 g	10.0 mL	592016	06/01/22 19:03	AM	TAL SAC
Total/NA	Analysis	537 (modified)		1			592377	06/03/22 03:55	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		5.54 g	10.0 mL	592016	06/01/22 19:03	AM	TAL SAC
Total/NA	Analysis	537 (modified)	DL	5			592588	06/03/22 19:02	S1M	TAL SAC

Client Sample ID: FP-P2:GW

Lab Sample ID: 320-88345-11

Date Collected: 05/23/22 12:40

Matrix: Water

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535	DL		277.1 mL	10.0 mL	592403	06/03/22 05:10	EFG	TAL SAC
Total/NA	Analysis	537 (modified)	DL	5			594581	06/11/22 10:39	D1R	TAL SAC
Total/NA	Prep	3535			277.1 mL	10.0 mL	592403	06/03/22 05:10	EFG	TAL SAC
Total/NA	Analysis	537 (modified)		1			593211	06/06/22 22:35	K1S	TAL SAC

Client Sample ID: FP-P3:1.2

Lab Sample ID: 320-88345-12

Date Collected: 05/23/22 13:30

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590962	05/27/22 10:41	TCS	TAL SAC

Client Sample ID: FP-P3:1.2

Lab Sample ID: 320-88345-12

Date Collected: 05/23/22 13:30

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 72.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.17 g	10.0 mL	592016	06/01/22 19:03	AM	TAL SAC
Total/NA	Analysis	537 (modified)		1			592377	06/03/22 04:35	S1M	TAL SAC

Client Sample ID: FP-P3:6.3

Lab Sample ID: 320-88345-13

Date Collected: 05/23/22 13:35

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590962	05/27/22 10:41	TCS	TAL SAC

Client Sample ID: FP-P3:6.3

Lab Sample ID: 320-88345-13

Date Collected: 05/23/22 13:35

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 80.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.41 g	10.0 mL	592016	06/01/22 19:03	AM	TAL SAC
Total/NA	Analysis	537 (modified)		1			592377	06/03/22 04:45	S1M	TAL SAC

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Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-SH1:0.5

Lab Sample ID: 320-88345-15

Date Collected: 05/23/22 13:50

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590962	05/27/22 10:41	TCS	TAL SAC

Client Sample ID: FP-SH1:0.5

Lab Sample ID: 320-88345-15

Date Collected: 05/23/22 13:50

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 88.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.09 g	10.0 mL	592016	06/01/22 19:03	AM	TAL SAC
Total/NA	Analysis	537 (modified)		1			592377	06/03/22 05:06	S1M	TAL SAC

Client Sample ID: FP-P3:GW

Lab Sample ID: 320-88345-16

Date Collected: 05/23/22 14:20

Matrix: Water

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535	DL		286.7 mL	10.0 mL	592403	06/03/22 05:10	EFG	TAL SAC
Total/NA	Analysis	537 (modified)	DL	10			594581	06/11/22 11:00	D1R	TAL SAC
Total/NA	Prep	3535			286.7 mL	10.0 mL	592403	06/03/22 05:10	EFG	TAL SAC
Total/NA	Analysis	537 (modified)		1			593211	06/06/22 22:46	K1S	TAL SAC
Total/NA	Prep	3535	DL2		286.7 mL	10.0 mL	592403	06/03/22 05:10	EFG	TAL SAC
Total/NA	Analysis	537 (modified)	DL2	20			596777	06/20/22 11:39	S1M	TAL SAC

Client Sample ID: FP-P4:1.4

Lab Sample ID: 320-88345-17

Date Collected: 05/23/22 15:15

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590962	05/27/22 10:41	TCS	TAL SAC

Client Sample ID: FP-P4:1.4

Lab Sample ID: 320-88345-17

Date Collected: 05/23/22 15:15

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 91.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.57 g	10.0 mL	592016	06/01/22 19:03	AM	TAL SAC
Total/NA	Analysis	537 (modified)		1			592377	06/03/22 05:16	S1M	TAL SAC

Client Sample ID: FP-P4:11.6

Lab Sample ID: 320-88345-18

Date Collected: 05/23/22 15:20

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590962	05/27/22 10:41	TCS	TAL SAC

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Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P4:11.6

Lab Sample ID: 320-88345-18

Date Collected: 05/23/22 15:20

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 77.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.25 g	10.0 mL	592016	06/01/22 19:03	AM	TAL SAC
Total/NA	Analysis	537 (modified)		1			592377	06/03/22 05:26	S1M	TAL SAC

Client Sample ID: FP-P4:GW

Lab Sample ID: 320-88345-20

Date Collected: 05/23/22 15:55

Matrix: Water

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535	DL		278.9 mL	10.0 mL	592403	06/03/22 05:10	EFG	TAL SAC
Total/NA	Analysis	537 (modified)	DL	5			594581	06/11/22 10:50	D1R	TAL SAC
Total/NA	Prep	3535			278.9 mL	10.0 mL	592403	06/03/22 05:10	EFG	TAL SAC
Total/NA	Analysis	537 (modified)		1			593211	06/06/22 22:56	K1S	TAL SAC

Client Sample ID: FP-SH2:0.5

Lab Sample ID: 320-88345-21

Date Collected: 05/23/22 16:00

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590962	05/27/22 10:41	TCS	TAL SAC

Client Sample ID: FP-SH2:0.5

Lab Sample ID: 320-88345-21

Date Collected: 05/23/22 16:00

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 89.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.40 g	10.0 mL	592016	06/01/22 19:03	AM	TAL SAC
Total/NA	Analysis	537 (modified)		1			592377	06/03/22 05:46	S1M	TAL SAC

Client Sample ID: FP-P5:0.5

Lab Sample ID: 320-88345-22

Date Collected: 05/24/22 08:20

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590962	05/27/22 10:41	TCS	TAL SAC

Client Sample ID: FP-P5:0.5

Lab Sample ID: 320-88345-22

Date Collected: 05/24/22 08:20

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 90.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.46 g	10.0 mL	592016	06/01/22 19:03	AM	TAL SAC
Total/NA	Analysis	537 (modified)		1			592377	06/03/22 05:56	S1M	TAL SAC

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Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P5:7.5

Lab Sample ID: 320-88345-23

Date Collected: 05/24/22 08:25

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590962	05/27/22 10:41	TCS	TAL SAC

Client Sample ID: FP-P5:7.5

Lab Sample ID: 320-88345-23

Date Collected: 05/24/22 08:25

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 83.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.18 g	10.0 mL	592016	06/01/22 19:03	AM	TAL SAC
Total/NA	Analysis	537 (modified)		1			592377	06/03/22 06:06	S1M	TAL SAC

Client Sample ID: FP-P6:0.5

Lab Sample ID: 320-88345-25

Date Collected: 05/24/22 09:20

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590962	05/27/22 10:41	TCS	TAL SAC

Client Sample ID: FP-P6:0.5

Lab Sample ID: 320-88345-25

Date Collected: 05/24/22 09:20

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 89.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.22 g	10.0 mL	592016	06/01/22 19:03	AM	TAL SAC
Total/NA	Analysis	537 (modified)		1			592377	06/03/22 06:47	S1M	TAL SAC
Total/NA	Prep	SHAKE	DL		5.22 g	10.0 mL	592016	06/01/22 19:03	AM	TAL SAC
Total/NA	Analysis	537 (modified)	DL	5			592588	06/03/22 19:12	S1M	TAL SAC

Client Sample ID: FP-P6:3.4

Lab Sample ID: 320-88345-26

Date Collected: 05/24/22 09:25

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590962	05/27/22 10:41	TCS	TAL SAC

Client Sample ID: FP-P6:3.4

Lab Sample ID: 320-88345-26

Date Collected: 05/24/22 09:25

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 72.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.60 g	10.0 mL	592016	06/01/22 19:03	AM	TAL SAC
Total/NA	Analysis	537 (modified)		1			592377	06/03/22 06:57	S1M	TAL SAC

Eurofins Sacramento

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P7:0.5

Lab Sample ID: 320-88345-28

Date Collected: 05/24/22 10:15

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590962	05/27/22 10:41	TCS	TAL SAC

Client Sample ID: FP-P7:0.5

Lab Sample ID: 320-88345-28

Date Collected: 05/24/22 10:15

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 90.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.40 g	10.0 mL	592017	06/01/22 19:07	AM	TAL SAC
Total/NA	Analysis	537 (modified)		1			592371	06/02/22 23:42	D1R	TAL SAC
Total/NA	Prep	SHAKE	DL		5.40 g	10.0 mL	592017	06/01/22 19:07	AM	TAL SAC
Total/NA	Analysis	537 (modified)	DL	50			592730	06/04/22 00:21	S1M	TAL SAC

Client Sample ID: FP-P7:7.0

Lab Sample ID: 320-88345-29

Date Collected: 05/24/22 10:20

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590962	05/27/22 10:41	TCS	TAL SAC

Client Sample ID: FP-P7:7.0

Lab Sample ID: 320-88345-29

Date Collected: 05/24/22 10:20

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 88.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.21 g	10.0 mL	592017	06/01/22 19:07	AM	TAL SAC
Total/NA	Analysis	537 (modified)		1			592371	06/03/22 00:12	D1R	TAL SAC
Total/NA	Prep	SHAKE	DL		5.21 g	10.0 mL	592017	06/01/22 19:07	AM	TAL SAC
Total/NA	Analysis	537 (modified)	DL	20			592730	06/04/22 00:00	S1M	TAL SAC

Client Sample ID: FP-P100:0.5

Lab Sample ID: 320-88345-31

Date Collected: 05/24/22 16:00

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590962	05/27/22 10:41	TCS	TAL SAC

Client Sample ID: FP-P100:0.5

Lab Sample ID: 320-88345-31

Date Collected: 05/24/22 16:00

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 88.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.58 g	10.0 mL	592017	06/01/22 19:07	AM	TAL SAC
Total/NA	Analysis	537 (modified)		1			592371	06/03/22 00:32	D1R	TAL SAC
Total/NA	Prep	SHAKE	DL		5.58 g	10.0 mL	592017	06/01/22 19:07	AM	TAL SAC
Total/NA	Analysis	537 (modified)	DL	50			592730	06/04/22 00:51	S1M	TAL SAC

Eurofins Sacramento

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-P8:1.5

Lab Sample ID: 320-88345-32

Date Collected: 05/24/22 10:50

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590962	05/27/22 10:41	TCS	TAL SAC

Client Sample ID: FP-P8:1.5

Lab Sample ID: 320-88345-32

Date Collected: 05/24/22 10:50

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 87.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.31 g	10.0 mL	592017	06/01/22 19:07	AM	TAL SAC
Total/NA	Analysis	537 (modified)		1			592371	06/03/22 00:43	D1R	TAL SAC

Client Sample ID: FP-P8:6.3

Lab Sample ID: 320-88345-33

Date Collected: 05/24/22 10:55

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			591015	05/27/22 12:40	TCS	TAL SAC

Client Sample ID: FP-P8:6.3

Lab Sample ID: 320-88345-33

Date Collected: 05/24/22 10:55

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 87.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.20 g	10.0 mL	593335	06/06/22 19:06	FX	TAL SAC
Total/NA	Analysis	537 (modified)		1			593229	06/07/22 11:05	K1S	TAL SAC

Client Sample ID: FP-P101:1.5

Lab Sample ID: 320-88345-35

Date Collected: 05/24/22 16:15

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			591015	05/27/22 12:40	TCS	TAL SAC

Client Sample ID: FP-P101:1.5

Lab Sample ID: 320-88345-35

Date Collected: 05/24/22 16:15

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 87.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE	DL		5.51 g	10.0 mL	592017	06/01/22 19:07	AM	TAL SAC
Total/NA	Analysis	537 (modified)	DL	5			592951	06/05/22 22:00	S1M	TAL SAC
Total/NA	Prep	SHAKE			5.51 g	10.0 mL	592017	06/01/22 19:07	AM	TAL SAC
Total/NA	Analysis	537 (modified)		1			592371	06/03/22 01:33	D1R	TAL SAC

Eurofins Sacramento

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-MW1:0.4

Date Collected: 05/24/22 13:00

Date Received: 05/26/22 09:35

Lab Sample ID: 320-88345-36

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			591015	05/27/22 12:40	TCS	TAL SAC

Client Sample ID: FP-MW1:0.4

Date Collected: 05/24/22 13:00

Date Received: 05/26/22 09:35

Lab Sample ID: 320-88345-36

Matrix: Solid

Percent Solids: 92.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.26 g	10.0 mL	592524	06/03/22 11:31	OP	TAL SAC
Total/NA	Analysis	537 (modified)		1			595997	06/15/22 18:58	K1S	TAL SAC

Client Sample ID: FP-MW1:7.6

Date Collected: 05/24/22 13:05

Date Received: 05/26/22 09:35

Lab Sample ID: 320-88345-37

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590941	05/27/22 09:57	TCS	TAL SAC

Client Sample ID: FP-MW1:7.6

Date Collected: 05/24/22 13:05

Date Received: 05/26/22 09:35

Lab Sample ID: 320-88345-37

Matrix: Solid

Percent Solids: 86.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.27 g	10.0 mL	592017	06/01/22 19:07	AM	TAL SAC
Total/NA	Analysis	537 (modified)		1			592371	06/03/22 01:43	D1R	TAL SAC
Total/NA	Prep	SHAKE	DL		5.27 g	10.0 mL	592017	06/01/22 19:07	AM	TAL SAC
Total/NA	Analysis	537 (modified)	DL	20			592730	06/04/22 00:11	S1M	TAL SAC

Client Sample ID: FP-MW100:0.4

Date Collected: 05/24/22 16:30

Date Received: 05/26/22 09:35

Lab Sample ID: 320-88345-39

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590941	05/27/22 09:57	TCS	TAL SAC

Client Sample ID: FP-MW100:0.4

Date Collected: 05/24/22 16:30

Date Received: 05/26/22 09:35

Lab Sample ID: 320-88345-39

Matrix: Solid

Percent Solids: 92.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.30 g	10.0 mL	592524	06/03/22 11:31	OP	TAL SAC
Total/NA	Analysis	537 (modified)		1			595997	06/15/22 19:19	K1S	TAL SAC

Eurofins Sacramento

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-MW2:0.5

Lab Sample ID: 320-88345-40

Date Collected: 05/25/22 08:00

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590941	05/27/22 09:57	TCS	TAL SAC

Client Sample ID: FP-MW2:0.5

Lab Sample ID: 320-88345-40

Date Collected: 05/25/22 08:00

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 87.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.57 g	10.0 mL	592524	06/03/22 11:31	OP	TAL SAC
Total/NA	Analysis	537 (modified)		1			595997	06/15/22 19:29	K1S	TAL SAC

Client Sample ID: FP-MW2:7.0

Lab Sample ID: 320-88345-41

Date Collected: 05/25/22 08:05

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590941	05/27/22 09:57	TCS	TAL SAC

Client Sample ID: FP-MW2:7.0

Lab Sample ID: 320-88345-41

Date Collected: 05/25/22 08:05

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 87.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.10 g	10.0 mL	592524	06/03/22 11:31	OP	TAL SAC
Total/NA	Analysis	537 (modified)		1			595997	06/15/22 19:39	K1S	TAL SAC

Client Sample ID: FP-MW101:0.5

Lab Sample ID: 320-88345-43

Date Collected: 05/25/22 16:00

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590941	05/27/22 09:57	TCS	TAL SAC

Client Sample ID: FP-MW101:0.5

Lab Sample ID: 320-88345-43

Date Collected: 05/25/22 16:00

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 87.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.25 g	10.0 mL	592524	06/03/22 11:31	OP	TAL SAC
Total/NA	Analysis	537 (modified)		1			595997	06/15/22 19:59	K1S	TAL SAC

Client Sample ID: FP-HA1:0.8

Lab Sample ID: 320-88345-44

Date Collected: 05/25/22 09:05

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590941	05/27/22 09:57	TCS	TAL SAC

Eurofins Sacramento

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-HA1:0.8

Lab Sample ID: 320-88345-44

Date Collected: 05/25/22 09:05

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 90.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.16 g	10.0 mL	592524	06/03/22 11:31	OP	TAL SAC
Total/NA	Analysis	537 (modified)		1			595997	06/15/22 20:09	K1S	TAL SAC

Client Sample ID: FP-HA1:4.0

Lab Sample ID: 320-88345-45

Date Collected: 05/25/22 09:15

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590941	05/27/22 09:57	TCS	TAL SAC

Client Sample ID: FP-HA1:4.0

Lab Sample ID: 320-88345-45

Date Collected: 05/25/22 09:15

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 89.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.11 g	10.0 mL	592524	06/03/22 11:31	OP	TAL SAC
Total/NA	Analysis	537 (modified)		1			595997	06/15/22 20:30	K1S	TAL SAC

Client Sample ID: FP-MW3:0.5

Lab Sample ID: 320-88345-46

Date Collected: 05/25/22 10:40

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590941	05/27/22 09:57	TCS	TAL SAC

Client Sample ID: FP-MW3:0.5

Lab Sample ID: 320-88345-46

Date Collected: 05/25/22 10:40

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 86.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.60 g	10.0 mL	592524	06/03/22 11:31	OP	TAL SAC
Total/NA	Analysis	537 (modified)		1			595997	06/15/22 20:40	K1S	TAL SAC

Client Sample ID: FP-MW3:2.7

Lab Sample ID: 320-88345-47

Date Collected: 05/25/22 10:45

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590941	05/27/22 09:57	TCS	TAL SAC

Eurofins Sacramento

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Client Sample ID: FP-MW3:2.7

Lab Sample ID: 320-88345-47

Date Collected: 05/25/22 10:45

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 88.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.56 g	10.0 mL	592524	06/03/22 11:31	OP	TAL SAC
Total/NA	Analysis	537 (modified)		1			595997	06/15/22 20:50	K1S	TAL SAC

Client Sample ID: FP-MW102:0.5

Lab Sample ID: 320-88345-49

Date Collected: 05/25/22 16:15

Matrix: Solid

Date Received: 05/26/22 09:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			590941	05/27/22 09:57	TCS	TAL SAC

Client Sample ID: FP-MW102:0.5

Lab Sample ID: 320-88345-49

Date Collected: 05/25/22 16:15

Matrix: Solid

Date Received: 05/26/22 09:35

Percent Solids: 90.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.08 g	10.0 mL	592524	06/03/22 11:31	OP	TAL SAC
Total/NA	Analysis	537 (modified)		1			595997	06/15/22 21:10	K1S	TAL SAC

Laboratory References:

TAL SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Laboratory: Eurofins Sacramento

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Oregon	NELAP	4040	01-29-23

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
D 2216		Solid	Percent Moisture
D 2216		Solid	Percent Solids
Washington	State	C581	05-05-23

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
D 2216		Solid	Percent Moisture
D 2216		Solid	Percent Solids

Method Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
D 2216	Percent Moisture	ASTM	TAL SAC
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC
SHAKE	Shake Extraction with Ultrasonic Bath Extraction	SW846	TAL SAC

Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88345-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-88345-1	FP-P9:0.5	Solid	05/23/22 09:35	05/26/22 09:35
320-88345-2	FP-P9:6.5	Solid	05/23/22 09:40	05/26/22 09:35
320-88345-4	FP-P9:GW	Water	05/23/22 10:00	05/26/22 09:35
320-88345-5	FP-P1:0.2	Solid	05/23/22 11:30	05/26/22 09:35
320-88345-6	FP-P1:10.2	Solid	05/23/22 11:35	05/26/22 09:35
320-88345-8	FP-P2:0.2	Solid	05/23/22 12:10	05/26/22 09:35
320-88345-9	FP-P2:5.3	Solid	05/23/22 12:15	05/26/22 09:35
320-88345-11	FP-P2:GW	Water	05/23/22 12:40	05/26/22 09:35
320-88345-12	FP-P3:1.2	Solid	05/23/22 13:30	05/26/22 09:35
320-88345-13	FP-P3:6.3	Solid	05/23/22 13:35	05/26/22 09:35
320-88345-15	FP-SH1:0.5	Solid	05/23/22 13:50	05/26/22 09:35
320-88345-16	FP-P3:GW	Water	05/23/22 14:20	05/26/22 09:35
320-88345-17	FP-P4:1.4	Solid	05/23/22 15:15	05/26/22 09:35
320-88345-18	FP-P4:11.6	Solid	05/23/22 15:20	05/26/22 09:35
320-88345-20	FP-P4:GW	Water	05/23/22 15:55	05/26/22 09:35
320-88345-21	FP-SH2:0.5	Solid	05/23/22 16:00	05/26/22 09:35
320-88345-22	FP-P5:0.5	Solid	05/24/22 08:20	05/26/22 09:35
320-88345-23	FP-P5:7.5	Solid	05/24/22 08:25	05/26/22 09:35
320-88345-25	FP-P6:0.5	Solid	05/24/22 09:20	05/26/22 09:35
320-88345-26	FP-P6:3.4	Solid	05/24/22 09:25	05/26/22 09:35
320-88345-28	FP-P7:0.5	Solid	05/24/22 10:15	05/26/22 09:35
320-88345-29	FP-P7:7.0	Solid	05/24/22 10:20	05/26/22 09:35
320-88345-31	FP-P100:0.5	Solid	05/24/22 16:00	05/26/22 09:35
320-88345-32	FP-P8:1.5	Solid	05/24/22 10:50	05/26/22 09:35
320-88345-33	FP-P8:6.3	Solid	05/24/22 10:55	05/26/22 09:35
320-88345-35	FP-P101:1.5	Solid	05/24/22 16:15	05/26/22 09:35
320-88345-36	FP-MW1:0.4	Solid	05/24/22 13:00	05/26/22 09:35
320-88345-37	FP-MW1:7.6	Solid	05/24/22 13:05	05/26/22 09:35
320-88345-39	FP-MW100:0.4	Solid	05/24/22 16:30	05/26/22 09:35
320-88345-40	FP-MW2:0.5	Solid	05/25/22 08:00	05/26/22 09:35
320-88345-41	FP-MW2:7.0	Solid	05/25/22 08:05	05/26/22 09:35
320-88345-43	FP-MW101:0.5	Solid	05/25/22 16:00	05/26/22 09:35
320-88345-44	FP-HA1:0.8	Solid	05/25/22 09:05	05/26/22 09:35
320-88345-45	FP-HA1:4.0	Solid	05/25/22 09:15	05/26/22 09:35
320-88345-46	FP-MW3:0.5	Solid	05/25/22 10:40	05/26/22 09:35
320-88345-47	FP-MW3:2.7	Solid	05/25/22 10:45	05/26/22 09:35
320-88345-49	FP-MW102:0.5	Solid	05/25/22 16:15	05/26/22 09:35

Chain of Custody Record

602617  eurofinsEnvironment Testing
TestAmericaAddress: _____

_____Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☒ Other: WA Dept. of Ecology

TAL-8210

Client Contact		Project Manager: <u>Ryan Peterson</u>		Site Contact: <u>Ryan Peterson</u>		Date: <u>5/23/22</u>		COC No:	
Company Name: <u>Shannon & Wilson</u>		Tel/Email: <u>Ryan.Peterson@shannon-wilson.com</u>		Lab Contact: <u>David Althacker</u>		Carrier:		1 of 5 COCs	
Address: <u>400 N. 34th St, Suite 100</u>		Analysis Turnaround Time		Filtered Sample (Y/N) Perform MS / MSD (Y/N) <u>PFAS, SS, 1, 18 Analytes</u>				Sampler: For Lab Use Only: Walk-in Client: Lab Sampling:	
City/State/Zip: <u>Seattle, WA 98103</u>		☐ CALENDAR DAYS ☒ WORKING DAYS							
Phone: <u>206-632-8020</u>		TAT if different from Below <u>15 days</u>							
Fax:		☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day							
Project Name: <u>Paine AFFF</u>								Job / SDG No.:	
Site: <u>Paine Field</u>									
P O # <u>102986</u>									
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sample Specific Notes:		
FP-P9:0.5		5/23	0935	G	Soil	1			
FP-P9:6.5			0940			1			
FP-P9:15.0			0945			1	Hold Analysis		
FP-P9:GW			1000		Water	2			
FP-P1:0.2			1130		Soil	1			
FP-P1:10.2			1135			1			
FP-P1:13.0			1140			1			
FP-P2:0.2			1210			1			
FP-P2:5.3			1215			1			
FP-P2:6.6			1220			1			
FP-P2:GW			1240		Water	2			
FP-P3:1.2			1330		Soil	1			
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other									
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) ☐ Return to Client ☒ Disposal by Lab ☐ Archive for _____ Months			
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown									
Special Instructions/QC Requirements & Comments: <u>PFAS may be detected > 1ppb</u>									
Custody Seals Intact: ☒ Yes ☐ No		Custody Seal No.: <u>1685378</u>		Cooler Temp. (°C): Obs'd: <u>1.6</u> Corr'd: <u>1.6</u> Therm ID No: <u>166</u>					
Relinquished by: <u>[Signature]</u> <u>RBP</u>		Company: <u>Shannon & Wilson</u> Date/Time: <u>5/23/22</u>		Received by: <u>[Signature]</u>		Company: <u>EETSAE</u> Date/Time: <u>5-26-22 0935</u>			
Relinquished by:		Company:		Date/Time:		Received by:		Company:	
Relinquished by:		Company:		Date/Time:		Received in Laboratory by:		Company:	

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☒ Other: WA Dept. of Ecology

Client Contact		Project Manager: Ryan Peterson		Site Contact: Ryan Peterson		Date: 5/24/22		COC No:	
Company Name: Shannon & Wilson		Tel/Email: Ryan.Peterson@ShannonWilson.com		Lab Contact: David Althuckor		Carrier:		2 of 5 COCs	
Address: 400 N. 34th St., Suite 100		Analysis Turnaround Time						Sampler:	
City/State/Zip: Seattle, WA 98103		☐ CALENDAR DAYS ☒ WORKING DAYS						For Lab Use Only:	
Phone: 206-632-8020		TAT if different from Below 15 days						Walk-in Client:	
Fax:		☐ 2 weeks						Lab Sampling:	
Project Name: Paine AFFF		☐ 1 week							
Site: Paine Field		☐ 2 days						Job / SDG No.:	
P O # 102986		☐ 1 day							
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	Sample Specific Notes:
FP-P3:6.3		5/23	1335	G	Soil	1		X	
FP-P3:14.7			1340			1			Hold Analysis
FP-SH1:0.5			1350			1		X	
FP-P3:GW			1420		Water	2	N	X	
FP-P4:1.4			1515		Soil	1		X	
FP-P4:11.6			1520			1		X	
FP-P4:15.0			1525			1			Hold Analysis
FP-P4:6W			1555		Water	2	N	X	
FP-SH2:0.5			1600		Soil	1		X	
FP-P5:0.5		5/24	0820			1		X	
FP-P5:7.5			0825			1		X	
FP-P5:20.0			0830			1			Hold Analysis
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other									
Possible Hazard Identification:									
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.									
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown									
Special Instructions/QC Requirements & Comments:									
PFAS may be detected >1ppb.									
Custody Seals Intact: ☒ Yes ☐ No		Custody Seal No.: 1685378		Cooler Temp. (°C): Obs'd: 22		Corr'd: 22		Therm ID No.: Lab	
Relinquished by: [Signature]		Company: Shannon & Wilson		Date/Time: 5/24/22		Received by: [Signature]		Company: EETSAC	
Relinquished by:		Company:		Date/Time:		Received by:		Company:	
Relinquished by:		Company:		Date/Time:		Received in Laboratory by:		Company:	

Chain of Custody Record

602619 eurofins

Environment Testing
TestAmericaAddress: _____

_____Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☒ Other: VA Dep. of Ecology

TAL-8210

Client Contact		Project Manager: Ryan Peterson		Site Contact: Ryan Peterson		Date: 5/24/22		COC No.:		
Company Name: Shannon & Wilson		Tel/Email: Ryan.Peterson@shannonwilson.com		Lab Contact: David Allacker		Carrier:		3 of 5 COCs		
Address: 400 N. 34th St., Suite 100		Analysis Turnaround Time		Filtered Sample (Y/N) Perform MS/MSD (Y/N) PFAS, 537-1, 18 Analytes				For Lab Use Only: Walk-in Client: Lab Sampling:		
City/State/Zip: Seattle, WA 98105		☐ CALENDAR DAYS ☒ WORKING DAYS								
Phone: 206-632-8020		TAT if different from Below 15 days								
Fax:										
Project Name: Paine AFFF		☐ 2 weeks						Job / SDG No.:		
Site: Paine Field		☐ 1 week								
P O # 102986		☐ 2 days								
☐ 1 day										
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sample Specific Notes:			
FP-P6:0.5		5/24	0920	G	Soil	1				
FP-P6:3.4			0925							
FP-P6:16.0			0930				Hold Analysis			
FP-P7:0.5			1015							
FP-P7:7.0			1020							
FP-P7:16.3			1025				Hold Analysis			
FP-P100:0.5			1600							
FP-P8:1.5			1050							
FP-P8:6.3			1055							
FP-P8:17.0			1100				Hold Analysis			
FP-P101:1.5			1615							
FP-MW1:0.4			1300							
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other										
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)				
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown						☐ Return to Client ☒ Disposal by Lab ☐ Archive for _____ Months				
Special Instructions/QC Requirements & Comments: PFAS may be detected 71ppb										
Custody Seals Intact: ☒ Yes ☐ No		Custody Seal No.: 1605378		Cooler Temp. (°C): Obs'd: 16		Corr'd: 16		Therm ID No.: LSC		
Relinquished by: [Signature]		Company: Shannon & Wilson		Date/Time: 5/25/22		Received by: [Signature]		Company: EET Inc		
Relinquished by:		Company:		Date/Time:		Received by:		Company:		
Relinquished by:		Company:		Date/Time:		Received in Laboratory by:		Company:		

ID: FP-101:1.5 SSS-26-22

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

Address: _____

Chain of Custody Record

602620



Environment Testing
TestAmerica

TAL-8210

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☒ Other: WA Dept. of Ecology

Client Contact		Project Manager: <u>Ryan Peterson</u>		Site Contact: <u>Ryan Peterson</u>		Date: <u>5/24/22</u>		COC No:	
Company Name: <u>Shannon & Wilson</u>		Tel/Email: <u>Ryan.Peterson@shannonwilson.com</u>		Lab Contact: <u>David Althacker</u>		Carrier:		<u>4</u> of <u>5</u> COCs	
Address: <u>400 N. 24th St. Suite 100</u>		Analysis Turnaround Time							
City/State/Zip: <u>Seattle, WA 98103</u>		☐ CALENDAR DAYS ☒ WORKING DAYS							
Phone: <u>206-632-8020</u>		TAT if different from Below <u>15 days</u>							
Fax:		☐ 2 weeks							
Project Name: <u>Paine AFFF</u>		☐ 1 week							
Site: <u>Paine Field</u>		☐ 2 days							
P O # <u>102486</u>		☐ 1 day							
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	Sample Specific Notes:
<u>FP-MW1:7.6</u>		<u>5/24</u>	<u>1305</u>	<u>G</u>	<u>Soil</u>	<u>1</u>	<u>X</u>	<u>PFAS, 537, 18 Analytes</u>	
<u>FP-MW1:15.4</u>		<u>↓</u>	<u>1310</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>X</u>		<u>Hold Analysis</u>
<u>FP-MW100:0.4</u>		<u>↓</u>	<u>1630</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>X</u>		
<u>FP-MW2:0.5</u>		<u>5/25</u>	<u>0800</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>X</u>		
<u>FP-MW2:7.0</u>		<u>↓</u>	<u>0805</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>X</u>		
<u>FP-MW2:16.0</u>		<u>↓</u>	<u>0810</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>X</u>		<u>Hold Analysis</u>
<u>FP-MW101:0.5</u>		<u>↓</u>	<u>1600</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>X</u>		
<u>FP-HA1:0.8</u>		<u>↓</u>	<u>0905</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>X</u>		
<u>FP-HA1:4.0</u>		<u>↓</u>	<u>0915</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>X</u>		
<u>FP-MW3:0.5</u>		<u>↓</u>	<u>1040</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>X</u>		
<u>FP-MW3:2.7</u>		<u>↓</u>	<u>1045</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>X</u>		
<u>FP-MW3:35.0</u>		<u>↓</u>	<u>1050</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>X</u>		<u>Hold Analysis</u>
Preservation Used: 1= Ice, 2= HCl, 3= H2SO4, 4= HNO3, 5= NaOH, 6= Other _____									
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.					Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)				
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown					☐ Return to Client ☒ Disposal by Lab ☐ Archive for _____ Months				
Special Instructions/QC Requirements & Comments: <u>PFAS may be detected 71ppb.</u>									
Custody Seals Intact: ☒ Yes ☐ No		Custody Seal No.: <u>1685378</u>		Cooler Temp. (°C): Obs'd: <u>1.6</u> Corr'd: <u>1.6</u>		Therm ID No: <u>Lab</u>			
Relinquished by: <u>[Signature] ORP</u>		Company: <u>Shannon & Wilson</u>		Date/Time: <u>5/24/22</u>		Received by: <u>[Signature]</u>		Company: <u>EETSCU</u>	
Relinquished by:		Company:		Date/Time:		Received by:		Date/Time:	
Relinquished by:		Company:		Date/Time:		Received in Laboratory by:		Date/Time:	

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☒ Other:7/11/2022

Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 320-88345-1

Login Number: 88345

List Source: Eurofins Sacramento

List Number: 1

Creator: Oropeza, Salvador

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	1685378/1685379
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ANALYTICAL REPORT

Eurofins Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

Laboratory Job ID: 320-88632-1
Client Project/Site: Paine Field

For:
Shannon & Wilson, Inc
400 N. 34th Suite 100
PO BOX 300303
Seattle, Washington 98103

Attn: Ryan Peterson



Authorized for release by:
7/11/2022 9:56:55 AM

David Alltucker, Project Manager I
(916)374-4383
David.Alltucker@et.eurofinsus.com

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The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Qualifiers

LCMS

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
E	Result exceeded calibration range.
I	Value is EMPC (estimated maximum possible concentration).
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Job ID: 320-88632-1

Laboratory: Eurofins Sacramento

Narrative

Job Narrative 320-88632-1

Receipt

The samples were received on 6/4/2022 9:10 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.7° C.

LCMS

Method 537 (modified): Results for samples FP-MW1:GW (320-88632-4), FP-MW3:GW (320-88632-6), FP-MW4:GW (320-88632-7) and FP-MW100:GW (320-88632-8) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits

Method 537 (modified): Results for sample FP-MW2:GW (320-88632-5) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits

Method 537 (modified): The concentration of one or more analytes associated with the following sample exceeded the instrument calibration range at the maximum 100x dilution for the method: FP-MW2:GW (320-88632-5). These analytes have been qualified; however, the peak did not saturate the instrument detector. Historical data indicate that for the isotope dilution method, dilution and re-analysis will not produce significantly different results from those reported above the calibration range.

Method 537 (modified): The "I" qualifier means the transition mass ratio for the indicated analyte was above the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty, and the reported value may have some high bias. However, analyst judgment was used to positively identify the analyte. FP-EB2 (320-88632-3)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep

Method 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-595252.

Method 3535: The following samples in preparation batch 320-595252 were observed to have a thin layer of sediment present in the bottom of the bottle prior to extraction. FP-MW1:GW (320-88632-4), FP-MW3:GW (320-88632-6) and FP-MW100:GW (320-88632-8) preparation batch 320-595252

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Client Sample ID: FP-MW4:105.0

Lab Sample ID: 320-88632-1

No Detections.

Client Sample ID: FP-EB1

Lab Sample ID: 320-88632-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	1.6	J B	1.9	0.50	ng/L	1		537 (modified)	Total/NA

Client Sample ID: FP-EB2

Lab Sample ID: 320-88632-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.87	J	1.9	0.54	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.86	J	1.9	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	4.8	I B	1.9	0.50	ng/L	1		537 (modified)	Total/NA

Client Sample ID: FP-MW1:GW

Lab Sample ID: 320-88632-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorodecanoic acid (PFDA)	20		1.9	0.29	ng/L	1		537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	3.0		1.9	1.0	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	2900		190	54	ng/L	100		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	780		190	23	ng/L	100		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	2300		190	80	ng/L	100		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA) - DL	10000		190	25	ng/L	100		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	1100		190	19	ng/L	100		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	13000		190	53	ng/L	100		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	89000	E B	190	51	ng/L	100		537 (modified)	Total/NA

Client Sample ID: FP-MW2:GW

Lab Sample ID: 320-88632-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	360		2.0	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	230		2.0	0.85	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	28		2.0	0.27	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	1100		20	5.8	ng/L	10		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	340		20	2.0	ng/L	10		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	1800		20	5.7	ng/L	10		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	1000	B	20	5.4	ng/L	10		537 (modified)	Total/NA

Client Sample ID: FP-MW3:GW

Lab Sample ID: 320-88632-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	220		1.8	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	6.5		1.8	0.28	ng/L	1		537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	4.4		1.8	1.0	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	580		180	53	ng/L	100		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	1100		180	77	ng/L	100		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA) - DL	1600		180	25	ng/L	100		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	320		180	18	ng/L	100		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	4100		180	52	ng/L	100		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Sacramento

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Client Sample ID: FP-MW3:GW (Continued)

Lab Sample ID: 320-88632-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS) - DL	27000	B	180	49	ng/L	100		537 (modified)	Total/NA

Client Sample ID: FP-MW4:GW

Lab Sample ID: 320-88632-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	300		1.8	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	15		1.8	0.28	ng/L	1		537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	3.2		1.8	1.0	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	1400		180	53	ng/L	100		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	840		180	78	ng/L	100		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA) - DL	4600		180	25	ng/L	100		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	660		180	18	ng/L	100		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	8000		180	52	ng/L	100		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	37000	E B	180	49	ng/L	100		537 (modified)	Total/NA

Client Sample ID: FP-MW100:GW

Lab Sample ID: 320-88632-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorodecanoic acid (PFDA)	18		1.8	0.28	ng/L	1		537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	3.0		1.8	1.0	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	2900		180	53	ng/L	100		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	630		180	23	ng/L	100		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	2600		180	78	ng/L	100		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA) - DL	10000		180	25	ng/L	100		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	970		180	18	ng/L	100		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	13000		180	52	ng/L	100		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	120000	E B	180	49	ng/L	100		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Sacramento

Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Client Sample ID: FP-MW4:105.0

Lab Sample ID: 320-88632-1

Date Collected: 05/27/22 14:00

Matrix: Solid

Date Received: 06/04/22 09:10

Percent Solids: 95.6

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.21	0.032	ug/Kg	☆	06/07/22 19:31	06/18/22 01:46	1
Perfluoroheptanoic acid (PFHpA)	ND		0.21	0.040	ug/Kg	☆	06/07/22 19:31	06/18/22 01:46	1
Perfluorooctanoic acid (PFOA)	ND		0.21	0.055	ug/Kg	☆	06/07/22 19:31	06/18/22 01:46	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.023	ug/Kg	☆	06/07/22 19:31	06/18/22 01:46	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.050	ug/Kg	☆	06/07/22 19:31	06/18/22 01:46	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.044	ug/Kg	☆	06/07/22 19:31	06/18/22 01:46	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.031	ug/Kg	☆	06/07/22 19:31	06/18/22 01:46	1
Perfluorotridecanoic acid (PFTTrDA)	ND		0.21	0.022	ug/Kg	☆	06/07/22 19:31	06/18/22 01:46	1
Perfluorotetradecanoic acid (PFTTeA)	ND		0.21	0.039	ug/Kg	☆	06/07/22 19:31	06/18/22 01:46	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.040	ug/Kg	☆	06/07/22 19:31	06/18/22 01:46	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.21	0.030	ug/Kg	☆	06/07/22 19:31	06/18/22 01:46	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.21	0.045	ug/Kg	☆	06/07/22 19:31	06/18/22 01:46	1
NEtFOSAA	ND		0.21	0.050	ug/Kg	☆	06/07/22 19:31	06/18/22 01:46	1
NMeFOSAA	ND		0.21	0.024	ug/Kg	☆	06/07/22 19:31	06/18/22 01:46	1
HFPO-DA (GenX)	ND		0.21	0.043	ug/Kg	☆	06/07/22 19:31	06/18/22 01:46	1
9CI-PF3ONS	ND		0.21	0.037	ug/Kg	☆	06/07/22 19:31	06/18/22 01:46	1
11CI-PF3OUdS	ND		0.21	0.032	ug/Kg	☆	06/07/22 19:31	06/18/22 01:46	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.21	0.041	ug/Kg	☆	06/07/22 19:31	06/18/22 01:46	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	87		25 - 150	06/07/22 19:31	06/18/22 01:46	1
13C4 PFHpA	100		25 - 150	06/07/22 19:31	06/18/22 01:46	1
13C4 PFOA	89		25 - 150	06/07/22 19:31	06/18/22 01:46	1
13C5 PFNA	96		25 - 150	06/07/22 19:31	06/18/22 01:46	1
13C2 PFDA	89		25 - 150	06/07/22 19:31	06/18/22 01:46	1
13C2 PFUnA	85		25 - 150	06/07/22 19:31	06/18/22 01:46	1
13C2 PFDoA	94		25 - 150	06/07/22 19:31	06/18/22 01:46	1
13C2 PFTTeDA	84		25 - 150	06/07/22 19:31	06/18/22 01:46	1
13C3 PFBS	80		25 - 150	06/07/22 19:31	06/18/22 01:46	1
18O2 PFHxS	78		25 - 150	06/07/22 19:31	06/18/22 01:46	1
13C4 PFOS	80		25 - 150	06/07/22 19:31	06/18/22 01:46	1
d3-NMeFOSAA	113		25 - 150	06/07/22 19:31	06/18/22 01:46	1
d5-NEtFOSAA	102		25 - 150	06/07/22 19:31	06/18/22 01:46	1
13C3 HFPO-DA	81		25 - 150	06/07/22 19:31	06/18/22 01:46	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.4		0.1	0.1	%			06/07/22 11:31	1
Percent Solids	95.6		0.1	0.1	%			06/07/22 11:31	1

Client Sample ID: FP-EB1

Lab Sample ID: 320-88632-2

Date Collected: 06/02/22 13:50

Matrix: Water

Date Received: 06/04/22 09:10

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		1.9	0.54	ng/L		06/14/22 05:50	06/16/22 18:00	1
Perfluoroheptanoic acid (PFHpA)	ND		1.9	0.23	ng/L		06/14/22 05:50	06/16/22 18:00	1
Perfluorooctanoic acid (PFOA)	ND		1.9	0.79	ng/L		06/14/22 05:50	06/16/22 18:00	1
Perfluorononanoic acid (PFNA)	ND		1.9	0.25	ng/L		06/14/22 05:50	06/16/22 18:00	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Client Sample ID: FP-EB1

Date Collected: 06/02/22 13:50

Date Received: 06/04/22 09:10

Lab Sample ID: 320-88632-2

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorodecanoic acid (PFDA)	ND		1.9	0.29	ng/L		06/14/22 05:50	06/16/22 18:00	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.0	ng/L		06/14/22 05:50	06/16/22 18:00	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.51	ng/L		06/14/22 05:50	06/16/22 18:00	1
Perfluorotridecanoic acid (PFTrDA)	ND		1.9	1.2	ng/L		06/14/22 05:50	06/16/22 18:00	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9	0.68	ng/L		06/14/22 05:50	06/16/22 18:00	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.9	0.19	ng/L		06/14/22 05:50	06/16/22 18:00	1
Perfluorohexanesulfonic acid (PFHxS)	ND		1.9	0.53	ng/L		06/14/22 05:50	06/16/22 18:00	1
Perfluorooctanesulfonic acid (PFOS)	1.6	J B	1.9	0.50	ng/L		06/14/22 05:50	06/16/22 18:00	1
NEtFOSAA	ND		4.7	1.2	ng/L		06/14/22 05:50	06/16/22 18:00	1
NMeFOSAA	ND		4.7	1.1	ng/L		06/14/22 05:50	06/16/22 18:00	1
HFPO-DA (GenX)	ND		3.7	1.4	ng/L		06/14/22 05:50	06/16/22 18:00	1
9CI-PF3ONS	ND		1.9	0.22	ng/L		06/14/22 05:50	06/16/22 18:00	1
11CI-PF3OUdS	ND		1.9	0.30	ng/L		06/14/22 05:50	06/16/22 18:00	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.37	ng/L		06/14/22 05:50	06/16/22 18:00	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	104		25 - 150				06/14/22 05:50	06/16/22 18:00	1
13C4 PFHpA	105		25 - 150				06/14/22 05:50	06/16/22 18:00	1
13C4 PFOA	105		25 - 150				06/14/22 05:50	06/16/22 18:00	1
13C5 PFNA	110		25 - 150				06/14/22 05:50	06/16/22 18:00	1
13C2 PFDA	100		25 - 150				06/14/22 05:50	06/16/22 18:00	1
13C2 PFUnA	94		25 - 150				06/14/22 05:50	06/16/22 18:00	1
13C2 PFDoA	97		25 - 150				06/14/22 05:50	06/16/22 18:00	1
13C2 PFTeDA	90		25 - 150				06/14/22 05:50	06/16/22 18:00	1
13C3 PFBS	92		25 - 150				06/14/22 05:50	06/16/22 18:00	1
18O2 PFHxS	96		25 - 150				06/14/22 05:50	06/16/22 18:00	1
13C4 PFOS	94		25 - 150				06/14/22 05:50	06/16/22 18:00	1
d3-NMeFOSAA	91		25 - 150				06/14/22 05:50	06/16/22 18:00	1
d5-NEtFOSAA	94		25 - 150				06/14/22 05:50	06/16/22 18:00	1
13C3 HFPO-DA	95		25 - 150				06/14/22 05:50	06/16/22 18:00	1

Client Sample ID: FP-EB2

Date Collected: 06/02/22 14:40

Date Received: 06/04/22 09:10

Lab Sample ID: 320-88632-3

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.87	J	1.9	0.54	ng/L		06/14/22 05:50	06/23/22 11:21	1
Perfluoroheptanoic acid (PFHpA)	0.86	J	1.9	0.23	ng/L		06/14/22 05:50	06/23/22 11:21	1
Perfluorooctanoic acid (PFOA)	ND		1.9	0.79	ng/L		06/14/22 05:50	06/23/22 11:21	1
Perfluorononanoic acid (PFNA)	ND		1.9	0.25	ng/L		06/14/22 05:50	06/23/22 11:21	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.29	ng/L		06/14/22 05:50	06/23/22 11:21	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.0	ng/L		06/14/22 05:50	06/23/22 11:21	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.51	ng/L		06/14/22 05:50	06/23/22 11:21	1
Perfluorotridecanoic acid (PFTrDA)	ND		1.9	1.2	ng/L		06/14/22 05:50	06/23/22 11:21	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9	0.68	ng/L		06/14/22 05:50	06/23/22 11:21	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.9	0.19	ng/L		06/14/22 05:50	06/23/22 11:21	1
Perfluorohexanesulfonic acid (PFHxS)	ND		1.9	0.53	ng/L		06/14/22 05:50	06/23/22 11:21	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Client Sample ID: FP-EB2

Lab Sample ID: 320-88632-3

Date Collected: 06/02/22 14:40

Matrix: Water

Date Received: 06/04/22 09:10

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	4.8	I B	1.9	0.50	ng/L		06/14/22 05:50	06/23/22 11:21	1
NEtFOSAA	ND		4.6	1.2	ng/L		06/14/22 05:50	06/23/22 11:21	1
NMeFOSAA	ND		4.6	1.1	ng/L		06/14/22 05:50	06/23/22 11:21	1
HFPO-DA (GenX)	ND		3.7	1.4	ng/L		06/14/22 05:50	06/23/22 11:21	1
9CI-PF3ONS	ND		1.9	0.22	ng/L		06/14/22 05:50	06/23/22 11:21	1
11CI-PF3OUdS	ND		1.9	0.30	ng/L		06/14/22 05:50	06/23/22 11:21	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.37	ng/L		06/14/22 05:50	06/23/22 11:21	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	105		25 - 150				06/14/22 05:50	06/23/22 11:21	1
13C4 PFHpA	99		25 - 150				06/14/22 05:50	06/23/22 11:21	1
13C4 PFOA	101		25 - 150				06/14/22 05:50	06/23/22 11:21	1
13C5 PFNA	97		25 - 150				06/14/22 05:50	06/23/22 11:21	1
13C2 PFDA	93		25 - 150				06/14/22 05:50	06/23/22 11:21	1
13C2 PFUnA	106		25 - 150				06/14/22 05:50	06/23/22 11:21	1
13C2 PFDoA	96		25 - 150				06/14/22 05:50	06/23/22 11:21	1
13C2 PFTeDA	82		25 - 150				06/14/22 05:50	06/23/22 11:21	1
13C3 PFBS	86		25 - 150				06/14/22 05:50	06/23/22 11:21	1
18O2 PFHxS	97		25 - 150				06/14/22 05:50	06/23/22 11:21	1
13C4 PFOS	97		25 - 150				06/14/22 05:50	06/23/22 11:21	1
d3-NMeFOSAA	100		25 - 150				06/14/22 05:50	06/23/22 11:21	1
d5-NEtFOSAA	100		25 - 150				06/14/22 05:50	06/23/22 11:21	1
13C3 HFPO-DA	101		25 - 150				06/14/22 05:50	06/23/22 11:21	1

Client Sample ID: FP-MW1:GW

Lab Sample ID: 320-88632-4

Date Collected: 06/02/22 11:40

Matrix: Water

Date Received: 06/04/22 09:10

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorodecanoic acid (PFDA)	20		1.9	0.29	ng/L		06/14/22 05:50	06/16/22 18:20	1
Perfluoroundecanoic acid (PFUnA)	3.0		1.9	1.0	ng/L		06/14/22 05:50	06/16/22 18:20	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.52	ng/L		06/14/22 05:50	06/16/22 18:20	1
Perfluorotridecanoic acid (PFTTrDA)	ND		1.9	1.2	ng/L		06/14/22 05:50	06/16/22 18:20	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9	0.68	ng/L		06/14/22 05:50	06/16/22 18:20	1
NEtFOSAA	ND		4.7	1.2	ng/L		06/14/22 05:50	06/16/22 18:20	1
NMeFOSAA	ND		4.7	1.1	ng/L		06/14/22 05:50	06/16/22 18:20	1
HFPO-DA (GenX)	ND		3.8	1.4	ng/L		06/14/22 05:50	06/16/22 18:20	1
9CI-PF3ONS	ND		1.9	0.23	ng/L		06/14/22 05:50	06/16/22 18:20	1
11CI-PF3OUdS	ND		1.9	0.30	ng/L		06/14/22 05:50	06/16/22 18:20	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.38	ng/L		06/14/22 05:50	06/16/22 18:20	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	110		25 - 150				06/14/22 05:50	06/16/22 18:20	1
13C2 PFUnA	108		25 - 150				06/14/22 05:50	06/16/22 18:20	1
13C2 PFDoA	99		25 - 150				06/14/22 05:50	06/16/22 18:20	1
13C2 PFTeDA	82		25 - 150				06/14/22 05:50	06/16/22 18:20	1
13C4 PFOS	26		25 - 150				06/14/22 05:50	06/16/22 18:20	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Client Sample ID: FP-MW1:GW

Lab Sample ID: 320-88632-4

Date Collected: 06/02/22 11:40

Matrix: Water

Date Received: 06/04/22 09:10

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d3-NMeFOSAA	102		25 - 150	06/14/22 05:50	06/16/22 18:20	1
d5-NEtFOSAA	95		25 - 150	06/14/22 05:50	06/16/22 18:20	1
13C3 HFPO-DA	113		25 - 150	06/14/22 05:50	06/16/22 18:20	1

Method: 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	2900		190	54	ng/L		06/14/22 05:50	06/19/22 09:07	100
Perfluoroheptanoic acid (PFHpA)	780		190	23	ng/L		06/14/22 05:50	06/19/22 09:07	100
Perfluorooctanoic acid (PFOA)	2300		190	80	ng/L		06/14/22 05:50	06/19/22 09:07	100
Perfluorononanoic acid (PFNA)	10000		190	25	ng/L		06/14/22 05:50	06/19/22 09:07	100
Perfluorobutanesulfonic acid (PFBS)	1100		190	19	ng/L		06/14/22 05:50	06/19/22 09:07	100
Perfluorohexanesulfonic acid (PFHxS)	13000		190	53	ng/L		06/14/22 05:50	06/19/22 09:07	100
Perfluorooctanesulfonic acid (PFOS)	89000	E B	190	51	ng/L		06/14/22 05:50	06/19/22 09:07	100
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	98		25 - 150				06/14/22 05:50	06/19/22 09:07	100
13C4 PFHpA	85		25 - 150				06/14/22 05:50	06/19/22 09:07	100
13C4 PFOA	97		25 - 150				06/14/22 05:50	06/19/22 09:07	100
13C5 PFNA	81		25 - 150				06/14/22 05:50	06/19/22 09:07	100
13C3 PFBS	101		25 - 150				06/14/22 05:50	06/19/22 09:07	100
18O2 PFHxS	108		25 - 150				06/14/22 05:50	06/19/22 09:07	100
13C4 PFOS	98		25 - 150				06/14/22 05:50	06/19/22 09:07	100

Client Sample ID: FP-MW2:GW

Lab Sample ID: 320-88632-5

Date Collected: 06/02/22 14:15

Matrix: Water

Date Received: 06/04/22 09:10

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	360		2.0	0.25	ng/L		06/14/22 05:50	06/16/22 18:30	1
Perfluorooctanoic acid (PFOA)	230		2.0	0.85	ng/L		06/14/22 05:50	06/16/22 18:30	1
Perfluorononanoic acid (PFNA)	28		2.0	0.27	ng/L		06/14/22 05:50	06/16/22 18:30	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.31	ng/L		06/14/22 05:50	06/16/22 18:30	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		06/14/22 05:50	06/16/22 18:30	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.55	ng/L		06/14/22 05:50	06/16/22 18:30	1
Perfluorotridecanoic acid (PFTrDA)	ND		2.0	1.3	ng/L		06/14/22 05:50	06/16/22 18:30	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.73	ng/L		06/14/22 05:50	06/16/22 18:30	1
NEtFOSAA	ND		5.0	1.3	ng/L		06/14/22 05:50	06/16/22 18:30	1
NMeFOSAA	ND		5.0	1.2	ng/L		06/14/22 05:50	06/16/22 18:30	1
HFPO-DA (GenX)	ND		4.0	1.5	ng/L		06/14/22 05:50	06/16/22 18:30	1
9Cl-PF3ONS	ND		2.0	0.24	ng/L		06/14/22 05:50	06/16/22 18:30	1
11Cl-PF3OUdS	ND		2.0	0.32	ng/L		06/14/22 05:50	06/16/22 18:30	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0	0.40	ng/L		06/14/22 05:50	06/16/22 18:30	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFHpA	98		25 - 150				06/14/22 05:50	06/16/22 18:30	1
13C4 PFOA	97		25 - 150				06/14/22 05:50	06/16/22 18:30	1
13C5 PFNA	101		25 - 150				06/14/22 05:50	06/16/22 18:30	1
13C2 PFDA	104		25 - 150				06/14/22 05:50	06/16/22 18:30	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Client Sample ID: FP-MW2:GW

Lab Sample ID: 320-88632-5

Date Collected: 06/02/22 14:15

Matrix: Water

Date Received: 06/04/22 09:10

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFUnA	98		25 - 150	06/14/22 05:50	06/16/22 18:30	1
13C2 PFDoA	98		25 - 150	06/14/22 05:50	06/16/22 18:30	1
13C2 PFTeDA	89		25 - 150	06/14/22 05:50	06/16/22 18:30	1
13C4 PFOS	90		25 - 150	06/14/22 05:50	06/16/22 18:30	1
d3-NMeFOSAA	97		25 - 150	06/14/22 05:50	06/16/22 18:30	1
d5-NEtFOSAA	98		25 - 150	06/14/22 05:50	06/16/22 18:30	1
13C3 HFPO-DA	109		25 - 150	06/14/22 05:50	06/16/22 18:30	1

Method: 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	1100		20	5.8	ng/L		06/14/22 05:50	07/01/22 11:26	10
Perfluorobutanesulfonic acid (PFBS)	340		20	2.0	ng/L		06/14/22 05:50	07/01/22 11:26	10
Perfluorohexanesulfonic acid (PFHxS)	1800		20	5.7	ng/L		06/14/22 05:50	07/01/22 11:26	10
Perfluorooctanesulfonic acid (PFOS)	1000	B	20	5.4	ng/L		06/14/22 05:50	07/01/22 11:26	10
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	99		25 - 150				06/14/22 05:50	07/01/22 11:26	10
13C3 PFBS	89		25 - 150				06/14/22 05:50	07/01/22 11:26	10
18O2 PFHxS	90		25 - 150				06/14/22 05:50	07/01/22 11:26	10
13C4 PFOS	86		25 - 150				06/14/22 05:50	07/01/22 11:26	10

Client Sample ID: FP-MW3:GW

Lab Sample ID: 320-88632-6

Date Collected: 06/02/22 16:00

Matrix: Water

Date Received: 06/04/22 09:10

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	220		1.8	0.23	ng/L		06/14/22 05:50	06/16/22 18:40	1
Perfluorodecanoic acid (PFDA)	6.5		1.8	0.28	ng/L		06/14/22 05:50	06/16/22 18:40	1
Perfluoroundecanoic acid (PFUnA)	4.4		1.8	1.0	ng/L		06/14/22 05:50	06/16/22 18:40	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.50	ng/L		06/14/22 05:50	06/16/22 18:40	1
Perfluorotridecanoic acid (PFTrDA)	ND		1.8	1.2	ng/L		06/14/22 05:50	06/16/22 18:40	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.66	ng/L		06/14/22 05:50	06/16/22 18:40	1
NEtFOSAA	ND		4.5	1.2	ng/L		06/14/22 05:50	06/16/22 18:40	1
NMeFOSAA	ND		4.5	1.1	ng/L		06/14/22 05:50	06/16/22 18:40	1
HFPO-DA (GenX)	ND		3.6	1.4	ng/L		06/14/22 05:50	06/16/22 18:40	1
9CI-PF3ONS	ND		1.8	0.22	ng/L		06/14/22 05:50	06/16/22 18:40	1
11CI-PF3OUdS	ND		1.8	0.29	ng/L		06/14/22 05:50	06/16/22 18:40	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.8	0.36	ng/L		06/14/22 05:50	06/16/22 18:40	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFHpA	101		25 - 150				06/14/22 05:50	06/16/22 18:40	1
13C2 PFDA	111		25 - 150				06/14/22 05:50	06/16/22 18:40	1
13C2 PFUnA	112		25 - 150				06/14/22 05:50	06/16/22 18:40	1
13C2 PFDoA	120		25 - 150				06/14/22 05:50	06/16/22 18:40	1
13C2 PFTeDA	101		25 - 150				06/14/22 05:50	06/16/22 18:40	1
13C4 PFOS	47		25 - 150				06/14/22 05:50	06/16/22 18:40	1
d3-NMeFOSAA	115		25 - 150				06/14/22 05:50	06/16/22 18:40	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Client Sample ID: FP-MW3:GW

Lab Sample ID: 320-88632-6

Date Collected: 06/02/22 16:00

Matrix: Water

Date Received: 06/04/22 09:10

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	112		25 - 150	06/14/22 05:50	06/16/22 18:40	1
13C3 HFPO-DA	118		25 - 150	06/14/22 05:50	06/16/22 18:40	1

Method: 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	580		180	53	ng/L		06/14/22 05:50	06/19/22 09:17	100
Perfluorooctanoic acid (PFOA)	1100		180	77	ng/L		06/14/22 05:50	06/19/22 09:17	100
Perfluorononanoic acid (PFNA)	1600		180	25	ng/L		06/14/22 05:50	06/19/22 09:17	100
Perfluorobutanesulfonic acid (PFBS)	320		180	18	ng/L		06/14/22 05:50	06/19/22 09:17	100
Perfluorohexanesulfonic acid (PFHxS)	4100		180	52	ng/L		06/14/22 05:50	06/19/22 09:17	100
Perfluorooctanesulfonic acid (PFOS)	27000	B	180	49	ng/L		06/14/22 05:50	06/19/22 09:17	100
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	97		25 - 150				06/14/22 05:50	06/19/22 09:17	100
13C4 PFOA	93		25 - 150				06/14/22 05:50	06/19/22 09:17	100
13C5 PFNA	86		25 - 150				06/14/22 05:50	06/19/22 09:17	100
13C3 PFBS	92		25 - 150				06/14/22 05:50	06/19/22 09:17	100
18O2 PFHxS	101		25 - 150				06/14/22 05:50	06/19/22 09:17	100
13C4 PFOS	84		25 - 150				06/14/22 05:50	06/19/22 09:17	100

Client Sample ID: FP-MW4:GW

Lab Sample ID: 320-88632-7

Date Collected: 06/02/22 12:40

Matrix: Water

Date Received: 06/04/22 09:10

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	300		1.8	0.23	ng/L		06/14/22 05:50	06/16/22 18:50	1
Perfluorodecanoic acid (PFDA)	15		1.8	0.28	ng/L		06/14/22 05:50	06/16/22 18:50	1
Perfluoroundecanoic acid (PFUnA)	3.2		1.8	1.0	ng/L		06/14/22 05:50	06/16/22 18:50	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.50	ng/L		06/14/22 05:50	06/16/22 18:50	1
Perfluorotridecanoic acid (PFTrDA)	ND		1.8	1.2	ng/L		06/14/22 05:50	06/16/22 18:50	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.67	ng/L		06/14/22 05:50	06/16/22 18:50	1
NEtFOSAA	ND		4.6	1.2	ng/L		06/14/22 05:50	06/16/22 18:50	1
NMeFOSAA	ND		4.6	1.1	ng/L		06/14/22 05:50	06/16/22 18:50	1
HFPO-DA (GenX)	ND		3.7	1.4	ng/L		06/14/22 05:50	06/16/22 18:50	1
9CI-PF3ONS	ND		1.8	0.22	ng/L		06/14/22 05:50	06/16/22 18:50	1
11CI-PF3OUdS	ND		1.8	0.29	ng/L		06/14/22 05:50	06/16/22 18:50	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.8	0.37	ng/L		06/14/22 05:50	06/16/22 18:50	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFHpA	81		25 - 150				06/14/22 05:50	06/16/22 18:50	1
13C2 PFDA	100		25 - 150				06/14/22 05:50	06/16/22 18:50	1
13C2 PFUnA	115		25 - 150				06/14/22 05:50	06/16/22 18:50	1
13C2 PFDoA	110		25 - 150				06/14/22 05:50	06/16/22 18:50	1
13C2 PFTeDA	93		25 - 150				06/14/22 05:50	06/16/22 18:50	1
13C4 PFOS	33		25 - 150				06/14/22 05:50	06/16/22 18:50	1
d3-NMeFOSAA	107		25 - 150				06/14/22 05:50	06/16/22 18:50	1
d5-NEtFOSAA	105		25 - 150				06/14/22 05:50	06/16/22 18:50	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Client Sample ID: FP-MW4:GW

Lab Sample ID: 320-88632-7

Date Collected: 06/02/22 12:40

Matrix: Water

Date Received: 06/04/22 09:10

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	116		25 - 150	06/14/22 05:50	06/16/22 18:50	1

Method: 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	1400		180	53	ng/L		06/14/22 05:50	06/19/22 09:27	100
Perfluorooctanoic acid (PFOA)	840		180	78	ng/L		06/14/22 05:50	06/19/22 09:27	100
Perfluorononanoic acid (PFNA)	4600		180	25	ng/L		06/14/22 05:50	06/19/22 09:27	100
Perfluorobutanesulfonic acid (PFBS)	660		180	18	ng/L		06/14/22 05:50	06/19/22 09:27	100
Perfluorohexanesulfonic acid (PFHxS)	8000		180	52	ng/L		06/14/22 05:50	06/19/22 09:27	100
Perfluorooctanesulfonic acid (PFOS)	37000	E B	180	49	ng/L		06/14/22 05:50	06/19/22 09:27	100

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	123		25 - 150	06/14/22 05:50	06/19/22 09:27	100
13C4 PFOA	104		25 - 150	06/14/22 05:50	06/19/22 09:27	100
13C5 PFNA	94		25 - 150	06/14/22 05:50	06/19/22 09:27	100
13C3 PFBS	127		25 - 150	06/14/22 05:50	06/19/22 09:27	100
18O2 PFHxS	115		25 - 150	06/14/22 05:50	06/19/22 09:27	100
13C4 PFOS	121		25 - 150	06/14/22 05:50	06/19/22 09:27	100

Client Sample ID: FP-MW100:GW

Lab Sample ID: 320-88632-8

Date Collected: 06/02/22 08:00

Matrix: Water

Date Received: 06/04/22 09:10

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorodecanoic acid (PFDA)	18		1.8	0.28	ng/L		06/14/22 05:50	06/16/22 19:21	1
Perfluoroundecanoic acid (PFUnA)	3.0		1.8	1.0	ng/L		06/14/22 05:50	06/16/22 19:21	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.50	ng/L		06/14/22 05:50	06/16/22 19:21	1
Perfluorotridecanoic acid (PFTrDA)	ND		1.8	1.2	ng/L		06/14/22 05:50	06/16/22 19:21	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.67	ng/L		06/14/22 05:50	06/16/22 19:21	1
NEtFOSAA	ND		4.6	1.2	ng/L		06/14/22 05:50	06/16/22 19:21	1
NMeFOSAA	ND		4.6	1.1	ng/L		06/14/22 05:50	06/16/22 19:21	1
HFPO-DA (GenX)	ND		3.7	1.4	ng/L		06/14/22 05:50	06/16/22 19:21	1
9Cl-PF3ONS	ND		1.8	0.22	ng/L		06/14/22 05:50	06/16/22 19:21	1
11Cl-PF3OUdS	ND		1.8	0.29	ng/L		06/14/22 05:50	06/16/22 19:21	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.8	0.37	ng/L		06/14/22 05:50	06/16/22 19:21	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	133		25 - 150	06/14/22 05:50	06/16/22 19:21	1
13C2 PFUnA	126		25 - 150	06/14/22 05:50	06/16/22 19:21	1
13C2 PFDoA	131		25 - 150	06/14/22 05:50	06/16/22 19:21	1
13C2 PFTeDA	121		25 - 150	06/14/22 05:50	06/16/22 19:21	1
13C4 PFOS	26		25 - 150	06/14/22 05:50	06/16/22 19:21	1
d3-NMeFOSAA	128		25 - 150	06/14/22 05:50	06/16/22 19:21	1
d5-NEtFOSAA	128		25 - 150	06/14/22 05:50	06/16/22 19:21	1
13C3 HFPO-DA	137		25 - 150	06/14/22 05:50	06/16/22 19:21	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Client Sample ID: FP-MW100:GW

Lab Sample ID: 320-88632-8

Date Collected: 06/02/22 08:00

Matrix: Water

Date Received: 06/04/22 09:10

Method: 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	2900		180	53	ng/L		06/14/22 05:50	06/19/22 09:37	100
Perfluoroheptanoic acid (PFHpA)	630		180	23	ng/L		06/14/22 05:50	06/19/22 09:37	100
Perfluorooctanoic acid (PFOA)	2600		180	78	ng/L		06/14/22 05:50	06/19/22 09:37	100
Perfluorononanoic acid (PFNA)	10000		180	25	ng/L		06/14/22 05:50	06/19/22 09:37	100
Perfluorobutanesulfonic acid (PFBS)	970		180	18	ng/L		06/14/22 05:50	06/19/22 09:37	100
Perfluorohexanesulfonic acid (PFHxS)	13000		180	52	ng/L		06/14/22 05:50	06/19/22 09:37	100
Perfluorooctanesulfonic acid (PFOS)	120000	E B	180	49	ng/L		06/14/22 05:50	06/19/22 09:37	100
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	104		25 - 150				06/14/22 05:50	06/19/22 09:37	100
13C4 PFHpA	111		25 - 150				06/14/22 05:50	06/19/22 09:37	100
13C4 PFOA	98		25 - 150				06/14/22 05:50	06/19/22 09:37	100
13C5 PFNA	101		25 - 150				06/14/22 05:50	06/19/22 09:37	100
13C3 PFBS	112		25 - 150				06/14/22 05:50	06/19/22 09:37	100
18O2 PFHxS	116		25 - 150				06/14/22 05:50	06/19/22 09:37	100
13C4 PFOS	94		25 - 150				06/14/22 05:50	06/19/22 09:37	100

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Solid

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFHxA (25-150)	C4PFHA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)	PFDaA (25-150)	PFTDA (25-150)
320-88632-1	FP-MW4:105.0	87	100	89	96	89	85	94	84
320-88632-1 MS	FP-MW4:105.0	84	91	90	91	83	80	92	79
320-88632-1 MSD	FP-MW4:105.0	84	96	86	95	91	91	93	85
LCS 320-593643/2-A	Lab Control Sample	86	93	87	91	79	86	86	79
MB 320-593643/1-A	Method Blank	75	78	83	74	80	78	84	70

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	C3PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	d3NMFOS (25-150)	d5NEFOS (25-150)	HFPODA (25-150)
320-88632-1	FP-MW4:105.0	80	78	80	113	102	81
320-88632-1 MS	FP-MW4:105.0	82	79	75	110	101	84
320-88632-1 MSD	FP-MW4:105.0	83	82	81	109	112	82
LCS 320-593643/2-A	Lab Control Sample	88	87	89	97	95	82
MB 320-593643/1-A	Method Blank	81	76	80	88	86	72

Surrogate Legend

PFHxA = 13C2 PFHxA
C4PFHA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA
PFUnA = 13C2 PFUnA
PFDaA = 13C2 PFDaA
PFTDA = 13C2 PFTeDA
C3PFBS = 13C3 PFBS
PFHxS = 18O2 PFHxS
PFOS = 13C4 PFOS
d3NMFOS = d3-NMeFOSAA
d5NEFOS = d5-NEtFOSAA
HFPODA = 13C3 HFPO-DA

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Water

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFHxA (25-150)	C4PFHA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)	PFDaA (25-150)	PFTDA (25-150)
320-88632-2	FP-EB1	104	105	105	110	100	94	97	90
320-88632-3	FP-EB2	105	99	101	97	93	106	96	82
320-88632-4	FP-MW1:GW					110	108	99	82
320-88632-4 - DL	FP-MW1:GW	98	85	97	81				
320-88632-5	FP-MW2:GW		98	97	101	104	98	98	89
320-88632-5 - DL	FP-MW2:GW	99							
320-88632-6	FP-MW3:GW		101			111	112	120	101
320-88632-6 - DL	FP-MW3:GW	97		93	86				
320-88632-7	FP-MW4:GW		81			100	115	110	93
320-88632-7 - DL	FP-MW4:GW	123		104	94				
320-88632-8	FP-MW100:GW					133	126	131	121
320-88632-8 - DL	FP-MW100:GW	104	111	98	101				
LCS 320-595252/2-A	Lab Control Sample	99	98	102	99	91	94	95	92
LCSD 320-595252/3-A	Lab Control Sample Dup	108	113	99	110	100	99	103	92

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Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Matrix: Water

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFHxA (25-150)	C4PFHA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)	PFDaA (25-150)	PFTDA (25-150)
MB 320-595252/1-A	Method Blank	98	103	93	101	100	91	95	91
		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	C3PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	d3NMFOS (25-150)	d5NEFOS (25-150)	HFPODA (25-150)		
320-88632-2	FP-EB1	92	96	94	91	94	95		
320-88632-3	FP-EB2	86	97	97	100	100	101		
320-88632-4	FP-MW1:GW			26	102	95	113		
320-88632-4 - DL	FP-MW1:GW	101	108	98					
320-88632-5	FP-MW2:GW			90	97	98	109		
320-88632-5 - DL	FP-MW2:GW	89	90	86					
320-88632-6	FP-MW3:GW			47	115	112	118		
320-88632-6 - DL	FP-MW3:GW	92	101	84					
320-88632-7	FP-MW4:GW			33	107	105	116		
320-88632-7 - DL	FP-MW4:GW	127	115	121					
320-88632-8	FP-MW100:GW			26	128	128	137		
320-88632-8 - DL	FP-MW100:GW	112	116	94					
LCS 320-595252/2-A	Lab Control Sample	97	100	95	97	94	97		
LCSD 320-595252/3-A	Lab Control Sample Dup	98	93	100	105	94	105		
MB 320-595252/1-A	Method Blank	95	95	94	92	97	98		

Surrogate Legend

PFHxA = 13C2 PFHxA
C4PFHA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA
PFUnA = 13C2 PFUnA
PFDaA = 13C2 PFDaA
PFTDA = 13C2 PFTeDA
C3PFBS = 13C3 PFBS
PFHxS = 18O2 PFHxS
PFOS = 13C4 PFOS
d3NMFOS = d3-NMeFOSAA
d5NEFOS = d5-NEtFOSAA
HFPODA = 13C3 HFPO-DA

QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-593643/1-A

Matrix: Solid

Analysis Batch: 596469

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 593643

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.031	ug/Kg		06/07/22 19:05	06/17/22 23:25	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.038	ug/Kg		06/07/22 19:05	06/17/22 23:25	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.053	ug/Kg		06/07/22 19:05	06/17/22 23:25	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.022	ug/Kg		06/07/22 19:05	06/17/22 23:25	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.048	ug/Kg		06/07/22 19:05	06/17/22 23:25	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.042	ug/Kg		06/07/22 19:05	06/17/22 23:25	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.030	ug/Kg		06/07/22 19:05	06/17/22 23:25	1
Perfluorotridecanoic acid (PFTrDA)	ND		0.20	0.021	ug/Kg		06/07/22 19:05	06/17/22 23:25	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.037	ug/Kg		06/07/22 19:05	06/17/22 23:25	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.038	ug/Kg		06/07/22 19:05	06/17/22 23:25	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.029	ug/Kg		06/07/22 19:05	06/17/22 23:25	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.20	0.043	ug/Kg		06/07/22 19:05	06/17/22 23:25	1
NEtFOSAA	ND		0.20	0.048	ug/Kg		06/07/22 19:05	06/17/22 23:25	1
NMeFOSAA	ND		0.20	0.023	ug/Kg		06/07/22 19:05	06/17/22 23:25	1
HFPO-DA (GenX)	ND		0.20	0.041	ug/Kg		06/07/22 19:05	06/17/22 23:25	1
9CI-PF3ONS	ND		0.20	0.035	ug/Kg		06/07/22 19:05	06/17/22 23:25	1
11CI-PF3OUdS	ND		0.20	0.031	ug/Kg		06/07/22 19:05	06/17/22 23:25	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.039	ug/Kg		06/07/22 19:05	06/17/22 23:25	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	75		25 - 150	06/07/22 19:05	06/17/22 23:25	1
13C4 PFHpA	78		25 - 150	06/07/22 19:05	06/17/22 23:25	1
13C4 PFOA	83		25 - 150	06/07/22 19:05	06/17/22 23:25	1
13C5 PFNA	74		25 - 150	06/07/22 19:05	06/17/22 23:25	1
13C2 PFDA	80		25 - 150	06/07/22 19:05	06/17/22 23:25	1
13C2 PFUnA	78		25 - 150	06/07/22 19:05	06/17/22 23:25	1
13C2 PFDoA	84		25 - 150	06/07/22 19:05	06/17/22 23:25	1
13C2 PFTeDA	70		25 - 150	06/07/22 19:05	06/17/22 23:25	1
13C3 PFBS	81		25 - 150	06/07/22 19:05	06/17/22 23:25	1
18O2 PFHxS	76		25 - 150	06/07/22 19:05	06/17/22 23:25	1
13C4 PFOS	80		25 - 150	06/07/22 19:05	06/17/22 23:25	1
d3-NMeFOSAA	88		25 - 150	06/07/22 19:05	06/17/22 23:25	1
d5-NEtFOSAA	86		25 - 150	06/07/22 19:05	06/17/22 23:25	1
13C3 HFPO-DA	72		25 - 150	06/07/22 19:05	06/17/22 23:25	1

Lab Sample ID: LCS 320-593643/2-A

Matrix: Solid

Analysis Batch: 596469

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 593643

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanoic acid (PFHxA)	2.00	1.94		ug/Kg		97	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	2.00		ug/Kg		100	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	2.05		ug/Kg		103	72 - 132
Perfluorononanoic acid (PFNA)	2.00	2.00		ug/Kg		100	73 - 133
Perfluorodecanoic acid (PFDA)	2.00	2.28		ug/Kg		114	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	2.15		ug/Kg		107	66 - 126

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-593643/2-A

Matrix: Solid

Analysis Batch: 596469

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 593643

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorododecanoic acid (PFDoA)	2.00	2.14		ug/Kg		107	71 - 131
Perfluorotridecanoic acid (PFTrDA)	2.00	1.93		ug/Kg		96	71 - 131
Perfluorotetradecanoic acid (PFTeA)	2.00	2.00		ug/Kg		100	67 - 127
Perfluorobutanesulfonic acid (PFBS)	1.77	1.84		ug/Kg		104	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.90		ug/Kg		104	62 - 122
Perfluorooctanesulfonic acid (PFOS)	1.86	1.94		ug/Kg		105	68 - 141
NEtFOSAA	2.00	2.08		ug/Kg		104	72 - 132
NMeFOSAA	2.00	1.77		ug/Kg		89	72 - 132
HFPO-DA (GenX)	2.00	2.11		ug/Kg		106	53 - 158
9Cl-PF3ONS	1.86	1.90		ug/Kg		102	74 - 134
11Cl-PF3OUdS	1.88	1.88		ug/Kg		100	66 - 136
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.88	1.90		ug/Kg		101	79 - 139

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C2 PFHxA	86		25 - 150
13C4 PFHpA	93		25 - 150
13C4 PFOA	87		25 - 150
13C5 PFNA	91		25 - 150
13C2 PFDA	79		25 - 150
13C2 PFUnA	86		25 - 150
13C2 PFDoA	86		25 - 150
13C2 PFTeDA	79		25 - 150
13C3 PFBS	88		25 - 150
18O2 PFHxS	87		25 - 150
13C4 PFOS	89		25 - 150
d3-NMeFOSAA	97		25 - 150
d5-NEtFOSAA	95		25 - 150
13C3 HFPO-DA	82		25 - 150

Lab Sample ID: 320-88632-1 MS

Matrix: Solid

Analysis Batch: 596469

Client Sample ID: FP-MW4:105.0

Prep Type: Total/NA

Prep Batch: 593643

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanoic acid (PFHxA)	ND		1.97	2.05		ug/Kg	✖	104	71 - 131
Perfluoroheptanoic acid (PFHpA)	ND		1.97	2.03		ug/Kg	✖	103	71 - 131
Perfluorooctanoic acid (PFOA)	ND		1.97	1.97		ug/Kg	✖	100	72 - 132
Perfluorononanoic acid (PFNA)	ND		1.97	1.98		ug/Kg	✖	100	73 - 133
Perfluorodecanoic acid (PFDA)	ND		1.97	2.03		ug/Kg	✖	103	72 - 132
Perfluoroundecanoic acid (PFUnA)	ND		1.97	2.17		ug/Kg	✖	110	66 - 126
Perfluorododecanoic acid (PFDoA)	ND		1.97	1.83		ug/Kg	✖	93	71 - 131

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-88632-1 MS

Matrix: Solid

Analysis Batch: 596469

Client Sample ID: FP-MW4:105.0

Prep Type: Total/NA

Prep Batch: 593643

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorotridecanoic acid (PFTTrDA)	ND		1.97	1.80		ug/Kg	⊛	91	71 - 131
Perfluorotetradecanoic acid (PFTTeA)	ND		1.97	1.97		ug/Kg	⊛	100	67 - 127
Perfluorobutanesulfonic acid (PFBS)	ND		1.74	1.76		ug/Kg	⊛	101	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	ND		1.80	1.77		ug/Kg	⊛	99	62 - 122
Perfluorooctanesulfonic acid (PFOS)	ND		1.83	1.95		ug/Kg	⊛	107	68 - 141
NEtFOSAA	ND		1.97	2.01		ug/Kg	⊛	102	72 - 132
NMeFOSAA	ND		1.97	1.83		ug/Kg	⊛	93	72 - 132
HFPO-DA (GenX)	ND		1.97	1.92		ug/Kg	⊛	97	53 - 158
9CI-PF3ONS	ND		1.84	2.00		ug/Kg	⊛	109	74 - 134
11CI-PF3OUdS	ND		1.86	2.13		ug/Kg	⊛	115	66 - 136
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.86	2.19		ug/Kg	⊛	118	79 - 139

Isotope Dilution	MS %Recovery	MS Qualifier	Limits
13C2 PFHxA	84		25 - 150
13C4 PFHpA	91		25 - 150
13C4 PFOA	90		25 - 150
13C5 PFNA	91		25 - 150
13C2 PFDA	83		25 - 150
13C2 PFUnA	80		25 - 150
13C2 PFDoA	92		25 - 150
13C2 PFTeDA	79		25 - 150
13C3 PFBS	82		25 - 150
18O2 PFHxS	79		25 - 150
13C4 PFOS	75		25 - 150
d3-NMeFOSAA	110		25 - 150
d5-NEtFOSAA	101		25 - 150
13C3 HFPO-DA	84		25 - 150

Lab Sample ID: 320-88632-1 MSD

Matrix: Solid

Analysis Batch: 596469

Client Sample ID: FP-MW4:105.0

Prep Type: Total/NA

Prep Batch: 593643

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	ND		1.96	2.02		ug/Kg	⊛	103	71 - 131	2	30
Perfluoroheptanoic acid (PFHpA)	ND		1.96	1.91		ug/Kg	⊛	98	71 - 131	6	30
Perfluorooctanoic acid (PFOA)	ND		1.96	2.03		ug/Kg	⊛	104	72 - 132	3	30
Perfluorononanoic acid (PFNA)	ND		1.96	1.89		ug/Kg	⊛	97	73 - 133	4	30
Perfluorodecanoic acid (PFDA)	ND		1.96	2.06		ug/Kg	⊛	105	72 - 132	2	30
Perfluoroundecanoic acid (PFUnA)	ND		1.96	2.05		ug/Kg	⊛	105	66 - 126	5	30
Perfluorododecanoic acid (PFDoA)	ND		1.96	1.83		ug/Kg	⊛	94	71 - 131	0	30
Perfluorotridecanoic acid (PFTTrDA)	ND		1.96	2.00		ug/Kg	⊛	102	71 - 131	11	30

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-88632-1 MSD

Matrix: Solid

Analysis Batch: 596469

Client Sample ID: FP-MW4:105.0

Prep Type: Total/NA

Prep Batch: 593643

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorotetradecanoic acid (PFTeA)	ND		1.96	2.08		ug/Kg	☼	106	67 - 127	5	30
Perfluorobutanesulfonic acid (PFBS)	ND		1.73	1.70		ug/Kg	☼	99	69 - 129	3	30
Perfluorohexanesulfonic acid (PFHxS)	ND		1.78	1.63		ug/Kg	☼	91	62 - 122	9	30
Perfluorooctanesulfonic acid (PFOS)	ND		1.81	1.89		ug/Kg	☼	104	68 - 141	3	30
NEtFOSAA	ND		1.96	1.96		ug/Kg	☼	100	72 - 132	3	30
NMeFOSAA	ND		1.96	1.96		ug/Kg	☼	100	72 - 132	7	30
HFPO-DA (GenX)	ND		1.96	1.95		ug/Kg	☼	100	53 - 158	2	30
9CI-PF3ONS	ND		1.82	1.87		ug/Kg	☼	103	74 - 134	6	30
11CI-PF3OUdS	ND		1.84	1.96		ug/Kg	☼	106	66 - 136	8	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.84	2.14		ug/Kg	☼	116	79 - 139	2	30

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C2 PFHxA	84		25 - 150
13C4 PFHpA	96		25 - 150
13C4 PFOA	86		25 - 150
13C5 PFNA	95		25 - 150
13C2 PFDA	91		25 - 150
13C2 PFUnA	91		25 - 150
13C2 PFDoA	93		25 - 150
13C2 PFTeDA	85		25 - 150
13C3 PFBS	83		25 - 150
18O2 PFHxS	82		25 - 150
13C4 PFOS	81		25 - 150
d3-NMeFOSAA	109		25 - 150
d5-NEtFOSAA	112		25 - 150
13C3 HFPO-DA	82		25 - 150

Lab Sample ID: MB 320-595252/1-A

Matrix: Water

Analysis Batch: 596214

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 595252

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.58	ng/L		06/14/22 05:50	06/16/22 17:19	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.25	ng/L		06/14/22 05:50	06/16/22 17:19	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.85	ng/L		06/14/22 05:50	06/16/22 17:19	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.27	ng/L		06/14/22 05:50	06/16/22 17:19	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.31	ng/L		06/14/22 05:50	06/16/22 17:19	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		06/14/22 05:50	06/16/22 17:19	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.55	ng/L		06/14/22 05:50	06/16/22 17:19	1
Perfluorotridecanoic acid (PFTrDA)	ND		2.0	1.3	ng/L		06/14/22 05:50	06/16/22 17:19	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.73	ng/L		06/14/22 05:50	06/16/22 17:19	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.20	ng/L		06/14/22 05:50	06/16/22 17:19	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.57	ng/L		06/14/22 05:50	06/16/22 17:19	1
Perfluorooctanesulfonic acid (PFOS)	1.34	J	2.0	0.54	ng/L		06/14/22 05:50	06/16/22 17:19	1
NEtFOSAA	ND		5.0	1.3	ng/L		06/14/22 05:50	06/16/22 17:19	1

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-595252/1-A

Matrix: Water

Analysis Batch: 596214

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 595252

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
NMeFOSAA	ND		5.0	1.2	ng/L		06/14/22 05:50	06/16/22 17:19	1
HFPO-DA (GenX)	ND		4.0	1.5	ng/L		06/14/22 05:50	06/16/22 17:19	1
9CI-PF3ONS	ND		2.0	0.24	ng/L		06/14/22 05:50	06/16/22 17:19	1
11CI-PF3OUdS	ND		2.0	0.32	ng/L		06/14/22 05:50	06/16/22 17:19	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0	0.40	ng/L		06/14/22 05:50	06/16/22 17:19	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	98		25 - 150	06/14/22 05:50	06/16/22 17:19	1
13C4 PFHpA	103		25 - 150	06/14/22 05:50	06/16/22 17:19	1
13C4 PFOA	93		25 - 150	06/14/22 05:50	06/16/22 17:19	1
13C5 PFNA	101		25 - 150	06/14/22 05:50	06/16/22 17:19	1
13C2 PFDA	100		25 - 150	06/14/22 05:50	06/16/22 17:19	1
13C2 PFUnA	91		25 - 150	06/14/22 05:50	06/16/22 17:19	1
13C2 PFDoA	95		25 - 150	06/14/22 05:50	06/16/22 17:19	1
13C2 PFTeDA	91		25 - 150	06/14/22 05:50	06/16/22 17:19	1
13C3 PFBS	95		25 - 150	06/14/22 05:50	06/16/22 17:19	1
18O2 PFHxS	95		25 - 150	06/14/22 05:50	06/16/22 17:19	1
13C4 PFOS	94		25 - 150	06/14/22 05:50	06/16/22 17:19	1
d3-NMeFOSAA	92		25 - 150	06/14/22 05:50	06/16/22 17:19	1
d5-NEtFOSAA	97		25 - 150	06/14/22 05:50	06/16/22 17:19	1
13C3 HFPO-DA	98		25 - 150	06/14/22 05:50	06/16/22 17:19	1

Lab Sample ID: LCS 320-595252/2-A

Matrix: Water

Analysis Batch: 596214

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 595252

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanoic acid (PFHxA)	40.0	37.0		ng/L		93	73 - 133
Perfluoroheptanoic acid (PFHpA)	40.0	41.7		ng/L		104	72 - 132
Perfluorooctanoic acid (PFOA)	40.0	38.0		ng/L		95	70 - 130
Perfluorononanoic acid (PFNA)	40.0	40.1		ng/L		100	75 - 135
Perfluorodecanoic acid (PFDA)	40.0	42.9		ng/L		107	76 - 136
Perfluoroundecanoic acid (PFUnA)	40.0	43.4		ng/L		108	68 - 128
Perfluorododecanoic acid (PFDoA)	40.0	39.2		ng/L		98	71 - 131
Perfluorotridecanoic acid (PFTTrDA)	40.0	38.3		ng/L		96	71 - 131
Perfluorotetradecanoic acid (PFTeA)	40.0	39.1		ng/L		98	70 - 130
Perfluorobutanesulfonic acid (PFBS)	35.4	37.1		ng/L		105	67 - 127
Perfluorohexanesulfonic acid (PFHxS)	36.4	33.5		ng/L		92	59 - 119
Perfluorooctanesulfonic acid (PFOS)	37.1	37.8		ng/L		102	70 - 130
NEtFOSAA	40.0	43.4		ng/L		108	76 - 136
NMeFOSAA	40.0	37.9		ng/L		95	76 - 136
HFPO-DA (GenX)	40.0	39.5		ng/L		99	51 - 173
9CI-PF3ONS	37.3	41.0		ng/L		110	75 - 135

Eurofins Sacramento

QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-595252/2-A

Matrix: Water

Analysis Batch: 596214

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 595252

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
11CI-PF3OUdS	37.7	38.6		ng/L		102	54 - 114
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	37.7	39.2		ng/L		104	79 - 139
Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits				
13C2 PFHxA	99		25 - 150				
13C4 PFHpA	98		25 - 150				
13C4 PFOA	102		25 - 150				
13C5 PFNA	99		25 - 150				
13C2 PFDA	91		25 - 150				
13C2 PFUnA	94		25 - 150				
13C2 PFDoA	95		25 - 150				
13C2 PFTeDA	92		25 - 150				
13C3 PFBS	97		25 - 150				
18O2 PFHxS	100		25 - 150				
13C4 PFOS	95		25 - 150				
d3-NMeFOSAA	97		25 - 150				
d5-NEtFOSAA	94		25 - 150				
13C3 HFPO-DA	97		25 - 150				

Lab Sample ID: LCSD 320-595252/3-A

Matrix: Water

Analysis Batch: 596214

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 595252

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	40.0	37.8		ng/L		95	73 - 133	2	30
Perfluoroheptanoic acid (PFHpA)	40.0	40.3		ng/L		101	72 - 132	3	30
Perfluorooctanoic acid (PFOA)	40.0	42.9		ng/L		107	70 - 130	12	30
Perfluorononanoic acid (PFNA)	40.0	37.0		ng/L		92	75 - 135	8	30
Perfluorodecanoic acid (PFDA)	40.0	40.1		ng/L		100	76 - 136	7	30
Perfluoroundecanoic acid (PFUnA)	40.0	41.4		ng/L		103	68 - 128	5	30
Perfluorododecanoic acid (PFDoA)	40.0	39.1		ng/L		98	71 - 131	0	30
Perfluorotridecanoic acid (PFTTrDA)	40.0	40.7		ng/L		102	71 - 131	6	30
Perfluorotetradecanoic acid (PFTeA)	40.0	43.1		ng/L		108	70 - 130	10	30
Perfluorobutanesulfonic acid (PFBS)	35.4	41.9		ng/L		118	67 - 127	12	30
Perfluorohexanesulfonic acid (PFHxS)	36.4	36.6		ng/L		100	59 - 119	9	30
Perfluorooctanesulfonic acid (PFOS)	37.1	38.1		ng/L		103	70 - 130	1	30
NEtFOSAA	40.0	40.5		ng/L		101	76 - 136	7	30
NMeFOSAA	40.0	36.4		ng/L		91	76 - 136	4	30
HFPO-DA (GenX)	40.0	39.0		ng/L		98	51 - 173	1	30
9CI-PF3ONS	37.3	39.1		ng/L		105	75 - 135	5	30
11CI-PF3OUdS	37.7	35.7		ng/L		95	54 - 114	8	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	37.7	41.1		ng/L		109	79 - 139	5	30

Eurofins Sacramento

QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

<i>Isotope Dilution</i>	<i>LCS D LCS D</i>		<i>Limits</i>
	<i>%Recovery</i>	<i>Qualifier</i>	
13C2 PFHxA	108		25 - 150
13C4 PFHpA	113		25 - 150
13C4 PFOA	99		25 - 150
13C5 PFNA	110		25 - 150
13C2 PFDA	100		25 - 150
13C2 PFUnA	99		25 - 150
13C2 PFDaA	103		25 - 150
13C2 PFTeDA	92		25 - 150
13C3 PFBS	98		25 - 150
18O2 PFHxS	93		25 - 150
13C4 PFOS	100		25 - 150
d3-NMeFOSAA	105		25 - 150
d5-NEtFOSAA	94		25 - 150
13C3 HFPO-DA	105		25 - 150

QC Association Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

LCMS

Prep Batch: 593643

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88632-1	FP-MW4:105.0	Total/NA	Solid	SHAKE	
MB 320-593643/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-593643/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-88632-1 MS	FP-MW4:105.0	Total/NA	Solid	SHAKE	
320-88632-1 MSD	FP-MW4:105.0	Total/NA	Solid	SHAKE	

Prep Batch: 595252

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88632-2	FP-EB1	Total/NA	Water	3535	
320-88632-3	FP-EB2	Total/NA	Water	3535	
320-88632-4	FP-MW1:GW	Total/NA	Water	3535	
320-88632-4 - DL	FP-MW1:GW	Total/NA	Water	3535	
320-88632-5 - DL	FP-MW2:GW	Total/NA	Water	3535	
320-88632-5	FP-MW2:GW	Total/NA	Water	3535	
320-88632-6	FP-MW3:GW	Total/NA	Water	3535	
320-88632-6 - DL	FP-MW3:GW	Total/NA	Water	3535	
320-88632-7	FP-MW4:GW	Total/NA	Water	3535	
320-88632-7 - DL	FP-MW4:GW	Total/NA	Water	3535	
320-88632-8 - DL	FP-MW100:GW	Total/NA	Water	3535	
320-88632-8	FP-MW100:GW	Total/NA	Water	3535	
MB 320-595252/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-595252/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-595252/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 596214

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88632-2	FP-EB1	Total/NA	Water	537 (modified)	595252
320-88632-4	FP-MW1:GW	Total/NA	Water	537 (modified)	595252
320-88632-5	FP-MW2:GW	Total/NA	Water	537 (modified)	595252
320-88632-6	FP-MW3:GW	Total/NA	Water	537 (modified)	595252
320-88632-7	FP-MW4:GW	Total/NA	Water	537 (modified)	595252
320-88632-8	FP-MW100:GW	Total/NA	Water	537 (modified)	595252
MB 320-595252/1-A	Method Blank	Total/NA	Water	537 (modified)	595252
LCS 320-595252/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	595252
LCSD 320-595252/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	595252

Analysis Batch: 596469

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88632-1	FP-MW4:105.0	Total/NA	Solid	537 (modified)	593643
MB 320-593643/1-A	Method Blank	Total/NA	Solid	537 (modified)	593643
LCS 320-593643/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	593643
320-88632-1 MS	FP-MW4:105.0	Total/NA	Solid	537 (modified)	593643
320-88632-1 MSD	FP-MW4:105.0	Total/NA	Solid	537 (modified)	593643

Analysis Batch: 596762

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88632-4 - DL	FP-MW1:GW	Total/NA	Water	537 (modified)	595252
320-88632-6 - DL	FP-MW3:GW	Total/NA	Water	537 (modified)	595252
320-88632-7 - DL	FP-MW4:GW	Total/NA	Water	537 (modified)	595252
320-88632-8 - DL	FP-MW100:GW	Total/NA	Water	537 (modified)	595252

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QC Association Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

LCMS

Analysis Batch: 597971

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88632-3	FP-EB2	Total/NA	Water	537 (modified)	595252

Analysis Batch: 600296

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88632-5 - DL	FP-MW2:GW	Total/NA	Water	537 (modified)	595252

General Chemistry

Analysis Batch: 593420

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-88632-1	FP-MW4:105.0	Total/NA	Solid	D 2216	

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Client Sample ID: FP-MW4:105.0

Date Collected: 05/27/22 14:00

Date Received: 06/04/22 09:10

Lab Sample ID: 320-88632-1

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			593420	06/07/22 11:31	TCS	TAL SAC

Client Sample ID: FP-MW4:105.0

Date Collected: 05/27/22 14:00

Date Received: 06/04/22 09:10

Lab Sample ID: 320-88632-1

Matrix: Solid

Percent Solids: 95.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.00 g	10.0 mL	593643	06/07/22 19:31	FX	TAL SAC
Total/NA	Analysis	537 (modified)		1			596469	06/18/22 01:46	K1S	TAL SAC

Client Sample ID: FP-EB1

Date Collected: 06/02/22 13:50

Date Received: 06/04/22 09:10

Lab Sample ID: 320-88632-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			268 mL	10.0 mL	595252	06/14/22 05:50	HK	TAL SAC
Total/NA	Analysis	537 (modified)		1			596214	06/16/22 18:00	RS1	TAL SAC

Client Sample ID: FP-EB2

Date Collected: 06/02/22 14:40

Date Received: 06/04/22 09:10

Lab Sample ID: 320-88632-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			269.1 mL	10.0 mL	595252	06/14/22 05:50	HK	TAL SAC
Total/NA	Analysis	537 (modified)		1			597971	06/23/22 11:21	MNV	TAL SAC

Client Sample ID: FP-MW1:GW

Date Collected: 06/02/22 11:40

Date Received: 06/04/22 09:10

Lab Sample ID: 320-88632-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			266.6 mL	10.0 mL	595252	06/14/22 05:50	HK	TAL SAC
Total/NA	Analysis	537 (modified)		1			596214	06/16/22 18:20	RS1	TAL SAC
Total/NA	Prep	3535	DL		266.6 mL	10.0 mL	595252	06/14/22 05:50	HK	TAL SAC
Total/NA	Analysis	537 (modified)	DL	100			596762	06/19/22 09:07	S1M	TAL SAC

Client Sample ID: FP-MW2:GW

Date Collected: 06/02/22 14:15

Date Received: 06/04/22 09:10

Lab Sample ID: 320-88632-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535	DL		248.6 mL	10.0 mL	595252	06/14/22 05:50	HK	TAL SAC
Total/NA	Analysis	537 (modified)	DL	10			600296	07/01/22 11:26	K1S	TAL SAC
Total/NA	Prep	3535			248.6 mL	10.0 mL	595252	06/14/22 05:50	HK	TAL SAC
Total/NA	Analysis	537 (modified)		1			596214	06/16/22 18:30	RS1	TAL SAC

Eurofins Sacramento

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Client Sample ID: FP-MW3:GW

Date Collected: 06/02/22 16:00

Date Received: 06/04/22 09:10

Lab Sample ID: 320-88632-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			275 mL	10.0 mL	595252	06/14/22 05:50	HK	TAL SAC
Total/NA	Analysis	537 (modified)		1			596214	06/16/22 18:40	RS1	TAL SAC
Total/NA	Prep	3535	DL		275 mL	10.0 mL	595252	06/14/22 05:50	HK	TAL SAC
Total/NA	Analysis	537 (modified)	DL	100			596762	06/19/22 09:17	S1M	TAL SAC

Client Sample ID: FP-MW4:GW

Date Collected: 06/02/22 12:40

Date Received: 06/04/22 09:10

Lab Sample ID: 320-88632-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			273.6 mL	10.0 mL	595252	06/14/22 05:50	HK	TAL SAC
Total/NA	Analysis	537 (modified)		1			596214	06/16/22 18:50	RS1	TAL SAC
Total/NA	Prep	3535	DL		273.6 mL	10.0 mL	595252	06/14/22 05:50	HK	TAL SAC
Total/NA	Analysis	537 (modified)	DL	100			596762	06/19/22 09:27	S1M	TAL SAC

Client Sample ID: FP-MW100:GW

Date Collected: 06/02/22 08:00

Date Received: 06/04/22 09:10

Lab Sample ID: 320-88632-8

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			273.9 mL	10.0 mL	595252	06/14/22 05:50	HK	TAL SAC
Total/NA	Analysis	537 (modified)		1			596214	06/16/22 19:21	RS1	TAL SAC
Total/NA	Prep	3535	DL		273.9 mL	10.0 mL	595252	06/14/22 05:50	HK	TAL SAC
Total/NA	Analysis	537 (modified)	DL	100			596762	06/19/22 09:37	S1M	TAL SAC

Laboratory References:

TAL SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Laboratory: Eurofins Sacramento

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Oregon	NELAP	4040	01-29-23

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
D 2216		Solid	Percent Moisture
D 2216		Solid	Percent Solids
Washington	State	C581	05-05-23

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
D 2216		Solid	Percent Moisture
D 2216		Solid	Percent Solids

Method Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
D 2216	Percent Moisture	ASTM	TAL SAC
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC
SHAKE	Shake Extraction with Ultrasonic Bath Extraction	SW846	TAL SAC

Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-88632-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-88632-1	FP-MW4:105.0	Solid	05/27/22 14:00	06/04/22 09:10
320-88632-2	FP-EB1	Water	06/02/22 13:50	06/04/22 09:10
320-88632-3	FP-EB2	Water	06/02/22 14:40	06/04/22 09:10
320-88632-4	FP-MW1:GW	Water	06/02/22 11:40	06/04/22 09:10
320-88632-5	FP-MW2:GW	Water	06/02/22 14:15	06/04/22 09:10
320-88632-6	FP-MW3:GW	Water	06/02/22 16:00	06/04/22 09:10
320-88632-7	FP-MW4:GW	Water	06/02/22 12:40	06/04/22 09:10
320-88632-8	FP-MW100:GW	Water	06/02/22 08:00	06/04/22 09:10

Chain of Custody Record

602622  eurofinsEnvironment Testing
TestAmericaAddress: _____

_____Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☒ Other: WA State Dept. of Ecology

TAL-8210

Client Contact		Project Manager: Ryan Peterson		Site Contact: Ryan Peterson		Date: 6/3/2022		COC No:	
Company Name: Shannon & Wilson		Tel/Email: Ryan.Peterson@shannon-wilson.com		Lab Contact: David Atkinson		Carrier:		1 of 1 COCs	
Address: 400 N. 34th Street Suite 100		Analysis Turnaround Time						Sampler: Ryan Peterson	
City/State/Zip: Seattle, WA 98103		☐ CALENDAR DAYS ☒ WORKING DAYS						For Lab Use Only:	
Phone: 206-632-8020		TAT if different from Below 15 days						Walk-in Client:	
Fax:		☐ 2 weeks						Lab Sampling:	
Project Name: Paine AFFF		☐ 1 week						Job / SDG No.:	
Site: Paine Field		☐ 2 days							
P O #: 102486		☐ 1 day							
Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	Sample Specific Notes:	
FP-MW4:105.0	5/27	1400	G	Soil	1	X	X		
FP-EB1	6/2	1350	G	Water	2	N	X		
FP-EB2		1440				N	X		
FP-MW1:6W		1140				N	X		
FP-MW2:6W		1415				N	X		
FP-MW3:6W		1600				N	X		
FP-MW4:6W		1240				N	X		
FP-MW100:6W		0800				N	X		
									
320-88632 Chain of Custody									
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)			
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.						☐ Return to Client ☒ Disposal by Lab ☐ Archive for _____ Months			
☒ Non-Hazardous ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown									
Special Instructions/QC Requirements & Comments: PFAS may be detected > 1 ppb.									
Custody Seals Intact: ☐ Yes ☐ No		Custody Seal No.: 1625381		Cooler Temp. (°C): Obs'd: 2.7		Corr'd: 2.7		Therm ID No.: C-11	
Relinquished by: Ryan Peterson		Company: Shannon & Wilson		Date/Time: 6/3/22 0940		Received by: [Signature]		Company: EESA	
Relinquished by:		Company:		Date/Time:		Received by:		Date/Time:	
Relinquished by:		Company:		Date/Time:		Received in Laboratory by:		Date/Time:	

Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 320-88632-1

Login Number: 88632

List Source: Eurofins Sacramento

List Number: 1

Creator: Oropeza, Salvador

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	1685381
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



ANALYTICAL REPORT

PREPARED FOR

Attn: Ryan Peterson
Shannon & Wilson, Inc
400 N. 34th Suite 100
PO BOX 300303
Seattle, Washington 98103

Generated 12/21/2022 2:23:47 PM

JOB DESCRIPTION

Paine Field

JOB NUMBER

320-94720-1

Eurofins Sacramento

Job Notes

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The data in the report relate to the field sample(s) as received by the laboratory and associated QC. All results have been reviewed and have been found to be compliant with laboratory and accreditation requirements, with the exception of the noted deviation(s). For questions, please contact the Project Manager.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Northern California, LLC Project Manager.

Authorization



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Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Qualifiers

LCMS

Qualifier	Qualifier Description
*5-	Isotope dilution analyte is outside acceptance limits, low biased.
E	Result exceeded calibration range.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Job ID: 320-94720-1

Laboratory: Eurofins Sacramento

Narrative

Job Narrative 320-94720-1

Receipt

The samples were received on 11/29/2022 9:20 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.7° C.

LCMS

Method 537 (modified): The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: FP-MW3-11232022 (320-94720-6). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples.

Method 537 (modified): Results for samples FP-MW4-11212022 (320-94720-2), FP-MW100-11212022 (320-94720-3), FP-MW3-11232022 (320-94720-6) and FP-MW2-11232022 (320-94720-8) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits

Method 537 (modified): The concentration of analytes associated with the following samples exceeded the instrument calibration range: FP-MW3-11232022 (320-94720-6). These analytes have been qualified; however, the peak(s) did not saturate the instrument detector. Historical data indicate that for the isotope dilution method, dilution and re-analysis will not produce significantly different results from those reported above the calibration range.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep

Method 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 320-636892.

Method 3535: The following samples were light yellow prior to extraction: FP-MW4-11212022 (320-94720-2), FP-MW100-11212022 (320-94720-3) and FP-MW2-11232022 (320-94720-8).
preparation batch 320-636892

Method 3535: The following sample contained floating particulates in the sample bottle prior to extraction: FP-MW2-11232022 (320-94720-8).
preparation batch 320-636892

Method 3535: The following sample was light yellow and contained a thin layer of sediment at the bottom of the bottle prior to extraction: FP-MW3-11232022 (320-94720-6).
preparation batch 320-636892

Method 3535: During the solid phase extraction process, the following samples contained non-settable particulates which clogged the solid phase extraction column: FP-MW4-11212022 (320-94720-2), FP-MW100-11212022 (320-94720-3), FP-MW3-11232022 (320-94720-6) and FP-MW2-11232022 (320-94720-8).
preparation batch 320-636892

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Client Sample ID: FP-MW5-11212022

Lab Sample ID: 320-94720-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	2.5		1.9	0.54	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.9		1.9	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.8	J	1.9	0.79	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.49	J	1.9	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	2.2		1.9	0.19	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.8	J	1.9	0.53	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	3.5		1.9	0.50	ng/L	1		537 (modified)	Total/NA

Client Sample ID: FP-MW4-11212022

Lab Sample ID: 320-94720-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	190		1.8	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	7.4		1.8	0.29	ng/L	1		537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	1.1	J	1.8	1.0	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	880		180	53	ng/L	100		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	440		180	78	ng/L	100		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA) - DL	2300		180	25	ng/L	100		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	570		180	18	ng/L	100		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	4800		180	53	ng/L	100		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	26000		180	50	ng/L	100		537 (modified)	Total/NA

Client Sample ID: FP-MW100-11212022

Lab Sample ID: 320-94720-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	190		1.8	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	7.4		1.8	0.29	ng/L	1		537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	1.2	J	1.8	1.0	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	980		180	54	ng/L	100		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	410		180	79	ng/L	100		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA) - DL	2100		180	25	ng/L	100		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	540		180	18	ng/L	100		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	6800		180	53	ng/L	100		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	27000		180	50	ng/L	100		537 (modified)	Total/NA

Client Sample ID: EB-1-11222022

Lab Sample ID: 320-94720-4

No Detections.

Client Sample ID: EB-2-11222022

Lab Sample ID: 320-94720-5

No Detections.

Client Sample ID: FP-MW3-11232022

Lab Sample ID: 320-94720-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorodecanoic acid (PFDA)	16		1.8	0.28	ng/L	1		537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	9.1		1.8	0.99	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	1300		180	52	ng/L	100		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	510		180	23	ng/L	100		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Sacramento

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Client Sample ID: FP-MW3-11232022 (Continued)

Lab Sample ID: 320-94720-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA) - DL	2100		180	77	ng/L	100		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA) - DL	3800		180	24	ng/L	100		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	750		180	18	ng/L	100		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	9300		180	51	ng/L	100		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	54000 E		180	49	ng/L	100		537 (modified)	Total/NA

Client Sample ID: DRUM-COMP-SOIL

Lab Sample ID: 320-94720-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	0.053	J	0.21	0.046	ug/Kg	1	✱	537 (modified)	Total/NA
HFPO-DA (GenX)	0.089	J	0.21	0.044	ug/Kg	1	✱	537 (modified)	Total/NA

Client Sample ID: FP-MW2-11232022

Lab Sample ID: 320-94720-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	280		1.8	0.22	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	64		1.8	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	730		36	10	ng/L	20		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	380		36	15	ng/L	20		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	630		36	3.6	ng/L	20		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	3500		36	10	ng/L	20		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	1700		36	9.6	ng/L	20		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Client Sample ID: FP-MW5-11212022

Lab Sample ID: 320-94720-1

Date Collected: 11/21/22 12:40

Matrix: Water

Date Received: 11/29/22 09:20

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	2.5		1.9	0.54	ng/L		12/02/22 12:46	12/12/22 02:51	1
Perfluoroheptanoic acid (PFHpA)	1.9		1.9	0.23	ng/L		12/02/22 12:46	12/12/22 02:51	1
Perfluorooctanoic acid (PFOA)	1.8	J	1.9	0.79	ng/L		12/02/22 12:46	12/12/22 02:51	1
Perfluorononanoic acid (PFNA)	0.49	J	1.9	0.25	ng/L		12/02/22 12:46	12/12/22 02:51	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.29	ng/L		12/02/22 12:46	12/12/22 02:51	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.0	ng/L		12/02/22 12:46	12/12/22 02:51	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.51	ng/L		12/02/22 12:46	12/12/22 02:51	1
Perfluorotridecanoic acid (PFTrDA)	ND		1.9	1.2	ng/L		12/02/22 12:46	12/12/22 02:51	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9	0.68	ng/L		12/02/22 12:46	12/12/22 02:51	1
Perfluorobutanesulfonic acid (PFBS)	2.2		1.9	0.19	ng/L		12/02/22 12:46	12/12/22 02:51	1
Perfluorohexanesulfonic acid (PFHxS)	1.8	J	1.9	0.53	ng/L		12/02/22 12:46	12/12/22 02:51	1
Perfluorooctanesulfonic acid (PFOS)	3.5		1.9	0.50	ng/L		12/02/22 12:46	12/12/22 02:51	1
NEtFOSAA	ND		4.7	1.2	ng/L		12/02/22 12:46	12/12/22 02:51	1
NMeFOSAA	ND		4.7	1.1	ng/L		12/02/22 12:46	12/12/22 02:51	1
HFPO-DA (GenX)	ND		3.7	1.4	ng/L		12/02/22 12:46	12/12/22 02:51	1
F-53B Major	ND		1.9	0.22	ng/L		12/02/22 12:46	12/12/22 02:51	1
F-53B Minor	ND		1.9	0.30	ng/L		12/02/22 12:46	12/12/22 02:51	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.37	ng/L		12/02/22 12:46	12/12/22 02:51	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	97		25 - 150	12/02/22 12:46	12/12/22 02:51	1
13C4 PFHpA	94		25 - 150	12/02/22 12:46	12/12/22 02:51	1
13C4 PFOA	94		25 - 150	12/02/22 12:46	12/12/22 02:51	1
13C5 PFNA	103		25 - 150	12/02/22 12:46	12/12/22 02:51	1
13C2 PFDA	97		25 - 150	12/02/22 12:46	12/12/22 02:51	1
13C2 PFUnA	100		25 - 150	12/02/22 12:46	12/12/22 02:51	1
13C2 PFDoA	98		25 - 150	12/02/22 12:46	12/12/22 02:51	1
13C2 PFTrDA	114		25 - 150	12/02/22 12:46	12/12/22 02:51	1
13C3 PFBS	92		25 - 150	12/02/22 12:46	12/12/22 02:51	1
18O2 PFHxS	104		25 - 150	12/02/22 12:46	12/12/22 02:51	1
13C4 PFOS	89		25 - 150	12/02/22 12:46	12/12/22 02:51	1
d3-NMeFOSAA	101		25 - 150	12/02/22 12:46	12/12/22 02:51	1
d5-NEtFOSAA	109		25 - 150	12/02/22 12:46	12/12/22 02:51	1
13C3 HFPO-DA	93		25 - 150	12/02/22 12:46	12/12/22 02:51	1

Client Sample ID: FP-MW4-11212022

Lab Sample ID: 320-94720-2

Date Collected: 11/21/22 17:05

Matrix: Water

Date Received: 11/29/22 09:20

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	190		1.8	0.23	ng/L		12/02/22 12:46	12/12/22 03:21	1
Perfluorodecanoic acid (PFDA)	7.4		1.8	0.29	ng/L		12/02/22 12:46	12/12/22 03:21	1
Perfluoroundecanoic acid (PFUnA)	1.1	J	1.8	1.0	ng/L		12/02/22 12:46	12/12/22 03:21	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.51	ng/L		12/02/22 12:46	12/12/22 03:21	1
Perfluorotridecanoic acid (PFTrDA)	ND		1.8	1.2	ng/L		12/02/22 12:46	12/12/22 03:21	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.67	ng/L		12/02/22 12:46	12/12/22 03:21	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Client Sample ID: FP-MW4-11212022

Lab Sample ID: 320-94720-2

Date Collected: 11/21/22 17:05

Matrix: Water

Date Received: 11/29/22 09:20

Method: EPA 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
NEtFOSAA	ND		4.6	1.2	ng/L		12/02/22 12:46	12/12/22 03:21	1
NMeFOSAA	ND		4.6	1.1	ng/L		12/02/22 12:46	12/12/22 03:21	1
HFPO-DA (GenX)	ND		3.7	1.4	ng/L		12/02/22 12:46	12/12/22 03:21	1
F-53B Major	ND		1.8	0.22	ng/L		12/02/22 12:46	12/12/22 03:21	1
F-53B Minor	ND		1.8	0.30	ng/L		12/02/22 12:46	12/12/22 03:21	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.8	0.37	ng/L		12/02/22 12:46	12/12/22 03:21	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFHpA	46		25 - 150				12/02/22 12:46	12/12/22 03:21	1
13C2 PFDA	62		25 - 150				12/02/22 12:46	12/12/22 03:21	1
13C2 PFUnA	61		25 - 150				12/02/22 12:46	12/12/22 03:21	1
13C2 PFDaA	57		25 - 150				12/02/22 12:46	12/12/22 03:21	1
13C2 PFTeDA	57		25 - 150				12/02/22 12:46	12/12/22 03:21	1
13C4 PFOS	29		25 - 150				12/02/22 12:46	12/12/22 03:21	1
d3-NMeFOSAA	59		25 - 150				12/02/22 12:46	12/12/22 03:21	1
d5-NEtFOSAA	58		25 - 150				12/02/22 12:46	12/12/22 03:21	1
13C3 HFPO-DA	59		25 - 150				12/02/22 12:46	12/12/22 03:21	1

Method: EPA 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	880		180	53	ng/L		12/02/22 12:46	12/13/22 18:27	100
Perfluorooctanoic acid (PFOA)	440		180	78	ng/L		12/02/22 12:46	12/13/22 18:27	100
Perfluorononanoic acid (PFNA)	2300		180	25	ng/L		12/02/22 12:46	12/13/22 18:27	100
Perfluorobutanesulfonic acid (PFBS)	570		180	18	ng/L		12/02/22 12:46	12/13/22 18:27	100
Perfluorohexanesulfonic acid (PFHxS)	4800		180	53	ng/L		12/02/22 12:46	12/13/22 18:27	100
Perfluorooctanesulfonic acid (PFOS)	26000		180	50	ng/L		12/02/22 12:46	12/13/22 18:27	100
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	64		25 - 150				12/02/22 12:46	12/13/22 18:27	100
13C4 PFOA	55		25 - 150				12/02/22 12:46	12/13/22 18:27	100
13C5 PFNA	56		25 - 150				12/02/22 12:46	12/13/22 18:27	100
13C3 PFBS	54		25 - 150				12/02/22 12:46	12/13/22 18:27	100
18O2 PFHxS	67		25 - 150				12/02/22 12:46	12/13/22 18:27	100
13C4 PFOS	49		25 - 150				12/02/22 12:46	12/13/22 18:27	100

Client Sample ID: FP-MW100-11212022

Lab Sample ID: 320-94720-3

Date Collected: 11/21/22 20:00

Matrix: Water

Date Received: 11/29/22 09:20

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	190		1.8	0.23	ng/L		12/02/22 12:46	12/12/22 03:31	1
Perfluorodecanoic acid (PFDA)	7.4		1.8	0.29	ng/L		12/02/22 12:46	12/12/22 03:31	1
Perfluoroundecanoic acid (PFUnA)	1.2 J		1.8	1.0	ng/L		12/02/22 12:46	12/12/22 03:31	1
Perfluorododecanoic acid (PFDaA)	ND		1.8	0.51	ng/L		12/02/22 12:46	12/12/22 03:31	1
Perfluorotridecanoic acid (PFTeDA)	ND		1.8	1.2	ng/L		12/02/22 12:46	12/12/22 03:31	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.67	ng/L		12/02/22 12:46	12/12/22 03:31	1
NEtFOSAA	ND		4.6	1.2	ng/L		12/02/22 12:46	12/12/22 03:31	1

Eurofins Sacramento

Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Client Sample ID: FP-MW100-11212022

Lab Sample ID: 320-94720-3

Date Collected: 11/21/22 20:00

Matrix: Water

Date Received: 11/29/22 09:20

Method: EPA 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
NMeFOSAA	ND		4.6	1.1	ng/L		12/02/22 12:46	12/12/22 03:31	1
HFPO-DA (GenX)	ND		3.7	1.4	ng/L		12/02/22 12:46	12/12/22 03:31	1
F-53B Major	ND		1.8	0.22	ng/L		12/02/22 12:46	12/12/22 03:31	1
F-53B Minor	ND		1.8	0.30	ng/L		12/02/22 12:46	12/12/22 03:31	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.8	0.37	ng/L		12/02/22 12:46	12/12/22 03:31	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFHpA	46		25 - 150				12/02/22 12:46	12/12/22 03:31	1
13C2 PFDA	62		25 - 150				12/02/22 12:46	12/12/22 03:31	1
13C2 PFUnA	64		25 - 150				12/02/22 12:46	12/12/22 03:31	1
13C2 PFDoA	59		25 - 150				12/02/22 12:46	12/12/22 03:31	1
13C2 PFTeDA	56		25 - 150				12/02/22 12:46	12/12/22 03:31	1
13C4 PFOS	30		25 - 150				12/02/22 12:46	12/12/22 03:31	1
d3-NMeFOSAA	60		25 - 150				12/02/22 12:46	12/12/22 03:31	1
d5-NEtFOSAA	56		25 - 150				12/02/22 12:46	12/12/22 03:31	1
13C3 HFPO-DA	59		25 - 150				12/02/22 12:46	12/12/22 03:31	1

Method: EPA 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	980		180	54	ng/L		12/02/22 12:46	12/13/22 18:38	100
Perfluorooctanoic acid (PFOA)	410		180	79	ng/L		12/02/22 12:46	12/13/22 18:38	100
Perfluorononanoic acid (PFNA)	2100		180	25	ng/L		12/02/22 12:46	12/13/22 18:38	100
Perfluorobutanesulfonic acid (PFBS)	540		180	18	ng/L		12/02/22 12:46	12/13/22 18:38	100
Perfluorohexanesulfonic acid (PFHxS)	6800		180	53	ng/L		12/02/22 12:46	12/13/22 18:38	100
Perfluorooctanesulfonic acid (PFOS)	27000		180	50	ng/L		12/02/22 12:46	12/13/22 18:38	100
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	54		25 - 150				12/02/22 12:46	12/13/22 18:38	100
13C4 PFOA	54		25 - 150				12/02/22 12:46	12/13/22 18:38	100
13C5 PFNA	57		25 - 150				12/02/22 12:46	12/13/22 18:38	100
13C3 PFBS	55		25 - 150				12/02/22 12:46	12/13/22 18:38	100
18O2 PFHxS	45		25 - 150				12/02/22 12:46	12/13/22 18:38	100
13C4 PFOS	44		25 - 150				12/02/22 12:46	12/13/22 18:38	100

Client Sample ID: EB-1-11222022

Lab Sample ID: 320-94720-4

Date Collected: 11/22/22 10:30

Matrix: Water

Date Received: 11/29/22 09:20

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		1.8	0.54	ng/L		12/02/22 12:46	12/12/22 03:42	1
Perfluoroheptanoic acid (PFHpA)	ND		1.8	0.23	ng/L		12/02/22 12:46	12/12/22 03:42	1
Perfluorooctanoic acid (PFOA)	ND		1.8	0.78	ng/L		12/02/22 12:46	12/12/22 03:42	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.25	ng/L		12/02/22 12:46	12/12/22 03:42	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.29	ng/L		12/02/22 12:46	12/12/22 03:42	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	1.0	ng/L		12/02/22 12:46	12/12/22 03:42	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.51	ng/L		12/02/22 12:46	12/12/22 03:42	1
Perfluorotridecanoic acid (PFTTrDA)	ND		1.8	1.2	ng/L		12/02/22 12:46	12/12/22 03:42	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.67	ng/L		12/02/22 12:46	12/12/22 03:42	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Client Sample ID: EB-1-11222022

Lab Sample ID: 320-94720-4

Date Collected: 11/22/22 10:30

Matrix: Water

Date Received: 11/29/22 09:20

Method: EPA 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	ND		1.8	0.18	ng/L		12/02/22 12:46	12/12/22 03:42	1
Perfluorohexanesulfonic acid (PFHxS)	ND		1.8	0.53	ng/L		12/02/22 12:46	12/12/22 03:42	1
Perfluorooctanesulfonic acid (PFOS)	ND		1.8	0.50	ng/L		12/02/22 12:46	12/12/22 03:42	1
NEtFOSAA	ND		4.6	1.2	ng/L		12/02/22 12:46	12/12/22 03:42	1
NMeFOSAA	ND		4.6	1.1	ng/L		12/02/22 12:46	12/12/22 03:42	1
HFPO-DA (GenX)	ND		3.7	1.4	ng/L		12/02/22 12:46	12/12/22 03:42	1
F-53B Major	ND		1.8	0.22	ng/L		12/02/22 12:46	12/12/22 03:42	1
F-53B Minor	ND		1.8	0.30	ng/L		12/02/22 12:46	12/12/22 03:42	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.8	0.37	ng/L		12/02/22 12:46	12/12/22 03:42	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	94		25 - 150	12/02/22 12:46	12/12/22 03:42	1
13C4 PFHpA	91		25 - 150	12/02/22 12:46	12/12/22 03:42	1
13C4 PFOA	97		25 - 150	12/02/22 12:46	12/12/22 03:42	1
13C5 PFNA	96		25 - 150	12/02/22 12:46	12/12/22 03:42	1
13C2 PFDA	108		25 - 150	12/02/22 12:46	12/12/22 03:42	1
13C2 PFUnA	106		25 - 150	12/02/22 12:46	12/12/22 03:42	1
13C2 PFDoA	97		25 - 150	12/02/22 12:46	12/12/22 03:42	1
13C2 PFTeDA	102		25 - 150	12/02/22 12:46	12/12/22 03:42	1
13C3 PFBS	91		25 - 150	12/02/22 12:46	12/12/22 03:42	1
18O2 PFHxS	94		25 - 150	12/02/22 12:46	12/12/22 03:42	1
13C4 PFOS	93		25 - 150	12/02/22 12:46	12/12/22 03:42	1
d3-NMeFOSAA	93		25 - 150	12/02/22 12:46	12/12/22 03:42	1
d5-NEtFOSAA	101		25 - 150	12/02/22 12:46	12/12/22 03:42	1
13C3 HFPO-DA	97		25 - 150	12/02/22 12:46	12/12/22 03:42	1

Client Sample ID: EB-2-11222022

Lab Sample ID: 320-94720-5

Date Collected: 11/22/22 15:15

Matrix: Water

Date Received: 11/29/22 09:20

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		1.8	0.53	ng/L		12/02/22 12:46	12/12/22 03:52	1
Perfluoroheptanoic acid (PFHpA)	ND		1.8	0.23	ng/L		12/02/22 12:46	12/12/22 03:52	1
Perfluorooctanoic acid (PFOA)	ND		1.8	0.78	ng/L		12/02/22 12:46	12/12/22 03:52	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.25	ng/L		12/02/22 12:46	12/12/22 03:52	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.29	ng/L		12/02/22 12:46	12/12/22 03:52	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	1.0	ng/L		12/02/22 12:46	12/12/22 03:52	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.51	ng/L		12/02/22 12:46	12/12/22 03:52	1
Perfluorotridecanoic acid (PFTeDA)	ND		1.8	1.2	ng/L		12/02/22 12:46	12/12/22 03:52	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.67	ng/L		12/02/22 12:46	12/12/22 03:52	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.8	0.18	ng/L		12/02/22 12:46	12/12/22 03:52	1
Perfluorohexanesulfonic acid (PFHxS)	ND		1.8	0.52	ng/L		12/02/22 12:46	12/12/22 03:52	1
Perfluorooctanesulfonic acid (PFOS)	ND		1.8	0.50	ng/L		12/02/22 12:46	12/12/22 03:52	1
NEtFOSAA	ND		4.6	1.2	ng/L		12/02/22 12:46	12/12/22 03:52	1
NMeFOSAA	ND		4.6	1.1	ng/L		12/02/22 12:46	12/12/22 03:52	1
HFPO-DA (GenX)	ND		3.7	1.4	ng/L		12/02/22 12:46	12/12/22 03:52	1
F-53B Major	ND		1.8	0.22	ng/L		12/02/22 12:46	12/12/22 03:52	1
F-53B Minor	ND		1.8	0.29	ng/L		12/02/22 12:46	12/12/22 03:52	1

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Client Sample ID: EB-2-11222022

Lab Sample ID: 320-94720-5

Date Collected: 11/22/22 15:15

Matrix: Water

Date Received: 11/29/22 09:20

Method: EPA 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.8	0.37	ng/L		12/02/22 12:46	12/12/22 03:52	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	103		25 - 150				12/02/22 12:46	12/12/22 03:52	1
13C4 PFHpA	99		25 - 150				12/02/22 12:46	12/12/22 03:52	1
13C4 PFOA	97		25 - 150				12/02/22 12:46	12/12/22 03:52	1
13C5 PFNA	106		25 - 150				12/02/22 12:46	12/12/22 03:52	1
13C2 PFDA	106		25 - 150				12/02/22 12:46	12/12/22 03:52	1
13C2 PFUnA	111		25 - 150				12/02/22 12:46	12/12/22 03:52	1
13C2 PFDoA	105		25 - 150				12/02/22 12:46	12/12/22 03:52	1
13C2 PFTeDA	114		25 - 150				12/02/22 12:46	12/12/22 03:52	1
13C3 PFBS	101		25 - 150				12/02/22 12:46	12/12/22 03:52	1
18O2 PFHxS	100		25 - 150				12/02/22 12:46	12/12/22 03:52	1
13C4 PFOS	96		25 - 150				12/02/22 12:46	12/12/22 03:52	1
d3-NMeFOSAA	103		25 - 150				12/02/22 12:46	12/12/22 03:52	1
d5-NEtFOSAA	103		25 - 150				12/02/22 12:46	12/12/22 03:52	1
13C3 HFPO-DA	96		25 - 150				12/02/22 12:46	12/12/22 03:52	1

Client Sample ID: FP-MW3-11232022

Lab Sample ID: 320-94720-6

Date Collected: 11/23/22 10:40

Matrix: Water

Date Received: 11/29/22 09:20

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorodecanoic acid (PFDA)	16		1.8	0.28	ng/L		12/02/22 12:46	12/12/22 04:02	1
Perfluoroundecanoic acid (PFUnA)	9.1		1.8	0.99	ng/L		12/02/22 12:46	12/12/22 04:02	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.50	ng/L		12/02/22 12:46	12/12/22 04:02	1
Perfluorotridecanoic acid (PFTTrDA)	ND		1.8	1.2	ng/L		12/02/22 12:46	12/12/22 04:02	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.66	ng/L		12/02/22 12:46	12/12/22 04:02	1
NEtFOSAA	ND		4.5	1.2	ng/L		12/02/22 12:46	12/12/22 04:02	1
NMeFOSAA	ND		4.5	1.1	ng/L		12/02/22 12:46	12/12/22 04:02	1
HFPO-DA (GenX)	ND		3.6	1.4	ng/L		12/02/22 12:46	12/12/22 04:02	1
F-53B Major	ND		1.8	0.22	ng/L		12/02/22 12:46	12/12/22 04:02	1
F-53B Minor	ND		1.8	0.29	ng/L		12/02/22 12:46	12/12/22 04:02	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.8	0.36	ng/L		12/02/22 12:46	12/12/22 04:02	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFDA	74		25 - 150				12/02/22 12:46	12/12/22 04:02	1
13C2 PFUnA	72		25 - 150				12/02/22 12:46	12/12/22 04:02	1
13C2 PFDoA	56		25 - 150				12/02/22 12:46	12/12/22 04:02	1
13C2 PFTeDA	48		25 - 150				12/02/22 12:46	12/12/22 04:02	1
13C4 PFOS	23	*5-	25 - 150				12/02/22 12:46	12/12/22 04:02	1
d3-NMeFOSAA	58		25 - 150				12/02/22 12:46	12/12/22 04:02	1
d5-NEtFOSAA	56		25 - 150				12/02/22 12:46	12/12/22 04:02	1
13C3 HFPO-DA	68		25 - 150				12/02/22 12:46	12/12/22 04:02	1

Method: EPA 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	1300		180	52	ng/L		12/02/22 12:46	12/13/22 18:48	100

Eurofins Sacramento

Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Client Sample ID: FP-MW3-11232022

Lab Sample ID: 320-94720-6

Date Collected: 11/23/22 10:40

Matrix: Water

Date Received: 11/29/22 09:20

Method: EPA 537 (modified) - Fluorinated Alkyl Substances - DL (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	510		180	23	ng/L		12/02/22 12:46	12/13/22 18:48	100
Perfluorooctanoic acid (PFOA)	2100		180	77	ng/L		12/02/22 12:46	12/13/22 18:48	100
Perfluorononanoic acid (PFNA)	3800		180	24	ng/L		12/02/22 12:46	12/13/22 18:48	100
Perfluorobutanesulfonic acid (PFBS)	750		180	18	ng/L		12/02/22 12:46	12/13/22 18:48	100
Perfluorohexanesulfonic acid (PFHxS)	9300		180	51	ng/L		12/02/22 12:46	12/13/22 18:48	100
Perfluorooctanesulfonic acid (PFOS)	54000	E	180	49	ng/L		12/02/22 12:46	12/13/22 18:48	100
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	62		25 - 150				12/02/22 12:46	12/13/22 18:48	100
13C4 PFHpA	47		25 - 150				12/02/22 12:46	12/13/22 18:48	100
13C4 PFOA	54		25 - 150				12/02/22 12:46	12/13/22 18:48	100
13C5 PFNA	56		25 - 150				12/02/22 12:46	12/13/22 18:48	100
13C3 PFBS	51		25 - 150				12/02/22 12:46	12/13/22 18:48	100
18O2 PFHxS	62		25 - 150				12/02/22 12:46	12/13/22 18:48	100
13C4 PFOS	55		25 - 150				12/02/22 12:46	12/13/22 18:48	100

Client Sample ID: DRUM-COMP-SOIL

Lab Sample ID: 320-94720-7

Date Collected: 11/23/22 12:00

Matrix: Solid

Date Received: 11/29/22 09:20

Percent Solids: 88.4

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.21	0.033	ug/Kg	☆	12/05/22 20:45	12/07/22 11:04	1
Perfluoroheptanoic acid (PFHpA)	ND		0.21	0.040	ug/Kg	☆	12/05/22 20:45	12/07/22 11:04	1
Perfluorooctanoic acid (PFOA)	ND		0.21	0.056	ug/Kg	☆	12/05/22 20:45	12/07/22 11:04	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.023	ug/Kg	☆	12/05/22 20:45	12/07/22 11:04	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.051	ug/Kg	☆	12/05/22 20:45	12/07/22 11:04	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.045	ug/Kg	☆	12/05/22 20:45	12/07/22 11:04	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.032	ug/Kg	☆	12/05/22 20:45	12/07/22 11:04	1
Perfluorotridecanoic acid (PFTrDA)	ND		0.21	0.022	ug/Kg	☆	12/05/22 20:45	12/07/22 11:04	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.039	ug/Kg	☆	12/05/22 20:45	12/07/22 11:04	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.040	ug/Kg	☆	12/05/22 20:45	12/07/22 11:04	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.21	0.031	ug/Kg	☆	12/05/22 20:45	12/07/22 11:04	1
Perfluorooctanesulfonic acid (PFOS)	0.053	J	0.21	0.046	ug/Kg	☆	12/05/22 20:45	12/07/22 11:04	1
NEtFOSAA	ND		0.21	0.051	ug/Kg	☆	12/05/22 20:45	12/07/22 11:04	1
NMeFOSAA	ND		0.21	0.024	ug/Kg	☆	12/05/22 20:45	12/07/22 11:04	1
HFPO-DA (GenX)	0.089	J	0.21	0.044	ug/Kg	☆	12/05/22 20:45	12/07/22 11:04	1
F-53B Major	ND		0.21	0.037	ug/Kg	☆	12/05/22 20:45	12/07/22 11:04	1
F-53B Minor	ND		0.21	0.033	ug/Kg	☆	12/05/22 20:45	12/07/22 11:04	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.21	0.042	ug/Kg	☆	12/05/22 20:45	12/07/22 11:04	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	80		25 - 150				12/05/22 20:45	12/07/22 11:04	1
13C4 PFHpA	82		25 - 150				12/05/22 20:45	12/07/22 11:04	1
13C4 PFOA	82		25 - 150				12/05/22 20:45	12/07/22 11:04	1
13C5 PFNA	92		25 - 150				12/05/22 20:45	12/07/22 11:04	1
13C2 PFDA	79		25 - 150				12/05/22 20:45	12/07/22 11:04	1
13C2 PFUnA	81		25 - 150				12/05/22 20:45	12/07/22 11:04	1

Eurofins Sacramento

Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Client Sample ID: DRUM-COMP-SOIL

Lab Sample ID: 320-94720-7

Date Collected: 11/23/22 12:00

Matrix: Solid

Date Received: 11/29/22 09:20

Percent Solids: 88.4

Method: EPA 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDoA	77		25 - 150	12/05/22 20:45	12/07/22 11:04	1
13C2 PFTeDA	88		25 - 150	12/05/22 20:45	12/07/22 11:04	1
13C3 PFBS	76		25 - 150	12/05/22 20:45	12/07/22 11:04	1
18O2 PFHxS	76		25 - 150	12/05/22 20:45	12/07/22 11:04	1
13C4 PFOS	77		25 - 150	12/05/22 20:45	12/07/22 11:04	1
d3-NMeFOSAA	75		25 - 150	12/05/22 20:45	12/07/22 11:04	1
d5-NEtFOSAA	78		25 - 150	12/05/22 20:45	12/07/22 11:04	1
13C3 HFPO-DA	79		25 - 150	12/05/22 20:45	12/07/22 11:04	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (ASTM D 2216)	11.6		0.1	0.1	%			11/30/22 10:26	1
Percent Solids (ASTM D 2216)	88.4		0.1	0.1	%			11/30/22 10:26	1

Client Sample ID: FP-MW2-11232022

Lab Sample ID: 320-94720-8

Date Collected: 11/23/22 12:05

Matrix: Water

Date Received: 11/29/22 09:20

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	280		1.8	0.22	ng/L		12/02/22 12:46	12/12/22 04:12	1
Perfluorononanoic acid (PFNA)	64		1.8	0.24	ng/L		12/02/22 12:46	12/12/22 04:12	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.28	ng/L		12/02/22 12:46	12/12/22 04:12	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.98	ng/L		12/02/22 12:46	12/12/22 04:12	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.49	ng/L		12/02/22 12:46	12/12/22 04:12	1
Perfluorotridecanoic acid (PFTTrDA)	ND		1.8	1.2	ng/L		12/02/22 12:46	12/12/22 04:12	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.65	ng/L		12/02/22 12:46	12/12/22 04:12	1
NEtFOSAA	ND		4.4	1.2	ng/L		12/02/22 12:46	12/12/22 04:12	1
NMeFOSAA	ND		4.4	1.1	ng/L		12/02/22 12:46	12/12/22 04:12	1
HFPO-DA (GenX)	ND		3.6	1.3	ng/L		12/02/22 12:46	12/12/22 04:12	1
F-53B Major	ND		1.8	0.21	ng/L		12/02/22 12:46	12/12/22 04:12	1
F-53B Minor	ND		1.8	0.28	ng/L		12/02/22 12:46	12/12/22 04:12	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.8	0.36	ng/L		12/02/22 12:46	12/12/22 04:12	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFHpA	41		25 - 150	12/02/22 12:46	12/12/22 04:12	1
13C5 PFNA	49		25 - 150	12/02/22 12:46	12/12/22 04:12	1
13C2 PFDA	55		25 - 150	12/02/22 12:46	12/12/22 04:12	1
13C2 PFUnA	54		25 - 150	12/02/22 12:46	12/12/22 04:12	1
13C2 PFDoA	47		25 - 150	12/02/22 12:46	12/12/22 04:12	1
13C2 PFTeDA	47		25 - 150	12/02/22 12:46	12/12/22 04:12	1
13C4 PFOS	49		25 - 150	12/02/22 12:46	12/12/22 04:12	1
d3-NMeFOSAA	48		25 - 150	12/02/22 12:46	12/12/22 04:12	1
d5-NEtFOSAA	47		25 - 150	12/02/22 12:46	12/12/22 04:12	1
13C3 HFPO-DA	49		25 - 150	12/02/22 12:46	12/12/22 04:12	1

Method: EPA 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	730		36	10	ng/L		12/02/22 12:46	12/13/22 18:07	20
Perfluorooctanoic acid (PFOA)	380		36	15	ng/L		12/02/22 12:46	12/13/22 18:07	20

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Client Sample ID: FP-MW2-11232022

Lab Sample ID: 320-94720-8

Date Collected: 11/23/22 12:05

Matrix: Water

Date Received: 11/29/22 09:20

Method: EPA 537 (modified) - Fluorinated Alkyl Substances - DL (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	630		36	3.6	ng/L		12/02/22 12:46	12/13/22 18:07	20
Perfluorohexanesulfonic acid (PFHxS)	3500		36	10	ng/L		12/02/22 12:46	12/13/22 18:07	20
Perfluorooctanesulfonic acid (PFOS)	1700		36	9.6	ng/L		12/02/22 12:46	12/13/22 18:07	20
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C2 PFHxA	47		25 - 150				12/02/22 12:46	12/13/22 18:07	20
13C4 PFOA	47		25 - 150				12/02/22 12:46	12/13/22 18:07	20
13C3 PFBS	48		25 - 150				12/02/22 12:46	12/13/22 18:07	20
18O2 PFHxS	49		25 - 150				12/02/22 12:46	12/13/22 18:07	20
13C4 PFOS	48		25 - 150				12/02/22 12:46	12/13/22 18:07	20

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Solid

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFHxA (25-150)	C4PFHA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)	PFDaA (25-150)	PFTDA (25-150)
320-94720-7	DRUM-COMP-SOIL	80	82	82	92	79	81	77	88
LCS 320-637659/2-A	Lab Control Sample	82	81	82	86	81	86	75	84
MB 320-637659/1-A	Method Blank	78	81	78	85	80	84	79	83

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	C3PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	d3NMFOS (25-150)	d5NEFOS (25-150)	HFPODA (25-150)
320-94720-7	DRUM-COMP-SOIL	76	76	77	75	78	79
LCS 320-637659/2-A	Lab Control Sample	80	78	79	82	85	76
MB 320-637659/1-A	Method Blank	80	80	77	75	81	78

Surrogate Legend

PFHxA = 13C2 PFHxA
C4PFHA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA
PFUnA = 13C2 PFUnA
PFDaA = 13C2 PFDaA
PFTDA = 13C2 PFTeDA
C3PFBS = 13C3 PFBS
PFHxS = 18O2 PFHxS
PFOS = 13C4 PFOS
d3NMFOS = d3-NMeFOSAA
d5NEFOS = d5-NEtFOSAA
HFPODA = 13C3 HFPO-DA

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Water

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFHxA (25-150)	C4PFHA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)	PFDaA (25-150)	PFTDA (25-150)
320-94720-1	FP-MW5-11212022	97	94	94	103	97	100	98	114
320-94720-2	FP-MW4-11212022		46			62	61	57	57
320-94720-2 - DL	FP-MW4-11212022	64		55	56				
320-94720-3	FP-MW100-11212022		46			62	64	59	56
320-94720-3 - DL	FP-MW100-11212022	54		54	57				
320-94720-4	EB-1-11222022	94	91	97	96	108	106	97	102
320-94720-5	EB-2-11222022	103	99	97	106	106	111	105	114
320-94720-6	FP-MW3-11232022					74	72	56	48
320-94720-6 - DL	FP-MW3-11232022	62	47	54	56				
320-94720-8	FP-MW2-11232022		41		49	55	54	47	47
320-94720-8 - DL	FP-MW2-11232022	47		47					
LCS 320-636892/2-A	Lab Control Sample	98	97	94	100	100	109	100	110
LCSD 320-636892/3-A	Lab Control Sample Dup	96	95	92	96	97	102	95	108
MB 320-636892/1-A	Method Blank	91	91	92	91	92	103	94	102

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	C3PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	d3NMFOS (25-150)	d5NEFOS (25-150)	HFPODA (25-150)
320-94720-1	FP-MW5-11212022	92	104	89	101	109	93

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Isotope Dilution Summary

Client: Shannon & Wilson, Inc

Job ID: 320-94720-1

Project/Site: Paine Field

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)					
		C3PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	d3NMFOS (25-150)	d5NEFOS (25-150)	HFPODA (25-150)
320-94720-2	FP-MW4-11212022			29	59	58	59
320-94720-2 - DL	FP-MW4-11212022	54	67	49			
320-94720-3	FP-MW100-11212022			30	60	56	59
320-94720-3 - DL	FP-MW100-11212022	55	45	44			
320-94720-4	EB-1-11222022	91	94	93	93	101	97
320-94720-5	EB-2-11222022	101	100	96	103	103	96
320-94720-6	FP-MW3-11232022			23 *5-	58	56	68
320-94720-6 - DL	FP-MW3-11232022	51	62	55			
320-94720-8	FP-MW2-11232022			49	48	47	49
320-94720-8 - DL	FP-MW2-11232022	48	49	48			
LCS 320-636892/2-A	Lab Control Sample	89	98	92	94	100	98
LCSD 320-636892/3-A	Lab Control Sample Dup	89	89	90	97	99	97
MB 320-636892/1-A	Method Blank	87	90	86	89	101	93

Surrogate Legend

PFHxA = 13C2 PFHxA
 C4PFHA = 13C4 PFHpA
 PFOA = 13C4 PFOA
 PFNA = 13C5 PFNA
 PFDA = 13C2 PFDA
 PFUnA = 13C2 PFUnA
 PFDaA = 13C2 PFDaA
 PFTDA = 13C2 PFTeDA
 C3PFBS = 13C3 PFBS
 PFHxS = 18O2 PFHxS
 PFOS = 13C4 PFOS
 d3NMFOS = d3-NMeFOSAA
 d5NEFOS = d5-NEtFOSAA
 HFPODA = 13C3 HFPO-DA

QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-636892/1-A

Matrix: Water

Analysis Batch: 639023

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 636892

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.58	ng/L		12/02/22 12:46	12/12/22 01:20	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.25	ng/L		12/02/22 12:46	12/12/22 01:20	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.85	ng/L		12/02/22 12:46	12/12/22 01:20	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.27	ng/L		12/02/22 12:46	12/12/22 01:20	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.31	ng/L		12/02/22 12:46	12/12/22 01:20	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		12/02/22 12:46	12/12/22 01:20	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.55	ng/L		12/02/22 12:46	12/12/22 01:20	1
Perfluorotridecanoic acid (PFTTrDA)	ND		2.0	1.3	ng/L		12/02/22 12:46	12/12/22 01:20	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.73	ng/L		12/02/22 12:46	12/12/22 01:20	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.20	ng/L		12/02/22 12:46	12/12/22 01:20	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.57	ng/L		12/02/22 12:46	12/12/22 01:20	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	0.54	ng/L		12/02/22 12:46	12/12/22 01:20	1
NEtFOSAA	ND		5.0	1.3	ng/L		12/02/22 12:46	12/12/22 01:20	1
NMeFOSAA	ND		5.0	1.2	ng/L		12/02/22 12:46	12/12/22 01:20	1
HFPO-DA (GenX)	ND		4.0	1.5	ng/L		12/02/22 12:46	12/12/22 01:20	1
F-53B Major	ND		2.0	0.24	ng/L		12/02/22 12:46	12/12/22 01:20	1
F-53B Minor	ND		2.0	0.32	ng/L		12/02/22 12:46	12/12/22 01:20	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0	0.40	ng/L		12/02/22 12:46	12/12/22 01:20	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	91		25 - 150	12/02/22 12:46	12/12/22 01:20	1
13C4 PFHpA	91		25 - 150	12/02/22 12:46	12/12/22 01:20	1
13C4 PFOA	92		25 - 150	12/02/22 12:46	12/12/22 01:20	1
13C5 PFNA	91		25 - 150	12/02/22 12:46	12/12/22 01:20	1
13C2 PFDA	92		25 - 150	12/02/22 12:46	12/12/22 01:20	1
13C2 PFUnA	103		25 - 150	12/02/22 12:46	12/12/22 01:20	1
13C2 PFDoA	94		25 - 150	12/02/22 12:46	12/12/22 01:20	1
13C2 PFTeDA	102		25 - 150	12/02/22 12:46	12/12/22 01:20	1
13C3 PFBS	87		25 - 150	12/02/22 12:46	12/12/22 01:20	1
18O2 PFHxS	90		25 - 150	12/02/22 12:46	12/12/22 01:20	1
13C4 PFOS	86		25 - 150	12/02/22 12:46	12/12/22 01:20	1
d3-NMeFOSAA	89		25 - 150	12/02/22 12:46	12/12/22 01:20	1
d5-NEtFOSAA	101		25 - 150	12/02/22 12:46	12/12/22 01:20	1
13C3 HFPO-DA	93		25 - 150	12/02/22 12:46	12/12/22 01:20	1

Lab Sample ID: LCS 320-636892/2-A

Matrix: Water

Analysis Batch: 639023

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 636892

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanoic acid (PFHxA)	40.0	39.3		ng/L		98	73 - 133
Perfluoroheptanoic acid (PFHpA)	40.0	41.4		ng/L		104	72 - 132
Perfluorooctanoic acid (PFOA)	40.0	43.1		ng/L		108	70 - 130
Perfluorononanoic acid (PFNA)	40.0	40.8		ng/L		102	75 - 135
Perfluorodecanoic acid (PFDA)	40.0	42.7		ng/L		107	76 - 136
Perfluoroundecanoic acid (PFUnA)	40.0	40.1		ng/L		100	68 - 128

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-636892/2-A

Matrix: Water

Analysis Batch: 639023

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 636892

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorododecanoic acid (PFDoA)	40.0	44.7		ng/L		112	71 - 131
Perfluorotridecanoic acid (PFTrDA)	40.0	44.8		ng/L		112	71 - 131
Perfluorotetradecanoic acid (PFTeA)	40.0	43.2		ng/L		108	70 - 130
Perfluorobutanesulfonic acid (PFBS)	35.5	36.5		ng/L		103	67 - 127
Perfluorohexanesulfonic acid (PFHxS)	36.5	36.2		ng/L		99	59 - 119
Perfluorooctanesulfonic acid (PFOS)	37.2	38.6		ng/L		104	70 - 130
NEtFOSAA	40.0	41.2		ng/L		103	76 - 136
NMeFOSAA	40.0	43.6		ng/L		109	76 - 136
HFPO-DA (GenX)	40.0	40.3		ng/L		101	51 - 173
F-53B Major	37.4	39.4		ng/L		106	75 - 135
F-53B Minor	37.8	41.9		ng/L		111	54 - 114
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	37.8	41.9		ng/L		111	79 - 139

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C2 PFHxA	98		25 - 150
13C4 PFHpA	97		25 - 150
13C4 PFOA	94		25 - 150
13C5 PFNA	100		25 - 150
13C2 PFDA	100		25 - 150
13C2 PFUnA	109		25 - 150
13C2 PFDoA	100		25 - 150
13C2 PFTeDA	110		25 - 150
13C3 PFBS	89		25 - 150
18O2 PFHxS	98		25 - 150
13C4 PFOS	92		25 - 150
d3-NMeFOSAA	94		25 - 150
d5-NEtFOSAA	100		25 - 150
13C3 HFPO-DA	98		25 - 150

Lab Sample ID: LCSD 320-636892/3-A

Matrix: Water

Analysis Batch: 639023

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 636892

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	40.0	40.7		ng/L		102	73 - 133	3	30
Perfluoroheptanoic acid (PFHpA)	40.0	43.5		ng/L		109	72 - 132	5	30
Perfluorooctanoic acid (PFOA)	40.0	44.6		ng/L		112	70 - 130	3	30
Perfluorononanoic acid (PFNA)	40.0	41.6		ng/L		104	75 - 135	2	30
Perfluorodecanoic acid (PFDA)	40.0	42.0		ng/L		105	76 - 136	2	30
Perfluoroundecanoic acid (PFUnA)	40.0	42.2		ng/L		105	68 - 128	5	30
Perfluorododecanoic acid (PFDoA)	40.0	45.7		ng/L		114	71 - 131	2	30

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 320-636892/3-A

Matrix: Water

Analysis Batch: 639023

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 636892

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorotridecanoic acid (PFTTrDA)	40.0	44.0		ng/L		110	71 - 131	2	30
Perfluorotetradecanoic acid (PFTTeA)	40.0	41.2		ng/L		103	70 - 130	5	30
Perfluorobutanesulfonic acid (PFBS)	35.5	36.1		ng/L		102	67 - 127	1	30
Perfluorohexanesulfonic acid (PFHxS)	36.5	37.8		ng/L		104	59 - 119	4	30
Perfluorooctanesulfonic acid (PFOS)	37.2	40.2		ng/L		108	70 - 130	4	30
NEtFOSAA	40.0	44.0		ng/L		110	76 - 136	7	30
NMeFOSAA	40.0	41.3		ng/L		103	76 - 136	5	30
HFPO-DA (GenX)	40.0	41.8		ng/L		104	51 - 173	4	30
F-53B Major	37.4	36.8		ng/L		98	75 - 135	7	30
F-53B Minor	37.8	42.0		ng/L		111	54 - 114	0	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	37.8	41.8		ng/L		111	79 - 139	0	30

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C2 PFHxA	96		25 - 150
13C4 PFHpA	95		25 - 150
13C4 PFOA	92		25 - 150
13C5 PFNA	96		25 - 150
13C2 PFDA	97		25 - 150
13C2 PFUnA	102		25 - 150
13C2 PFDoA	95		25 - 150
13C2 PFTeDA	108		25 - 150
13C3 PFBS	89		25 - 150
18O2 PFHxS	89		25 - 150
13C4 PFOS	90		25 - 150
d3-NMeFOSAA	97		25 - 150
d5-NEtFOSAA	99		25 - 150
13C3 HFPO-DA	97		25 - 150

Lab Sample ID: MB 320-637659/1-A

Matrix: Solid

Analysis Batch: 638111

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 637659

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.031	ug/Kg		12/05/22 20:45	12/07/22 10:44	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.038	ug/Kg		12/05/22 20:45	12/07/22 10:44	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.053	ug/Kg		12/05/22 20:45	12/07/22 10:44	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.022	ug/Kg		12/05/22 20:45	12/07/22 10:44	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.048	ug/Kg		12/05/22 20:45	12/07/22 10:44	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.042	ug/Kg		12/05/22 20:45	12/07/22 10:44	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.030	ug/Kg		12/05/22 20:45	12/07/22 10:44	1
Perfluorotridecanoic acid (PFTTrDA)	ND		0.20	0.021	ug/Kg		12/05/22 20:45	12/07/22 10:44	1
Perfluorotetradecanoic acid (PFTTeA)	ND		0.20	0.037	ug/Kg		12/05/22 20:45	12/07/22 10:44	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.038	ug/Kg		12/05/22 20:45	12/07/22 10:44	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.029	ug/Kg		12/05/22 20:45	12/07/22 10:44	1

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-637659/1-A

Matrix: Solid

Analysis Batch: 638111

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 637659

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	ND		0.20	0.043	ug/Kg		12/05/22 20:45	12/07/22 10:44	1
NEtFOSAA	ND		0.20	0.048	ug/Kg		12/05/22 20:45	12/07/22 10:44	1
NMeFOSAA	ND		0.20	0.023	ug/Kg		12/05/22 20:45	12/07/22 10:44	1
HFPO-DA (GenX)	ND		0.20	0.041	ug/Kg		12/05/22 20:45	12/07/22 10:44	1
F-53B Major	ND		0.20	0.035	ug/Kg		12/05/22 20:45	12/07/22 10:44	1
F-53B Minor	ND		0.20	0.031	ug/Kg		12/05/22 20:45	12/07/22 10:44	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.039	ug/Kg		12/05/22 20:45	12/07/22 10:44	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	78		25 - 150	12/05/22 20:45	12/07/22 10:44	1
13C4 PFHpA	81		25 - 150	12/05/22 20:45	12/07/22 10:44	1
13C4 PFOA	78		25 - 150	12/05/22 20:45	12/07/22 10:44	1
13C5 PFNA	85		25 - 150	12/05/22 20:45	12/07/22 10:44	1
13C2 PFDA	80		25 - 150	12/05/22 20:45	12/07/22 10:44	1
13C2 PFUnA	84		25 - 150	12/05/22 20:45	12/07/22 10:44	1
13C2 PFDoA	79		25 - 150	12/05/22 20:45	12/07/22 10:44	1
13C2 PFTeDA	83		25 - 150	12/05/22 20:45	12/07/22 10:44	1
13C3 PFBS	80		25 - 150	12/05/22 20:45	12/07/22 10:44	1
18O2 PFHxS	80		25 - 150	12/05/22 20:45	12/07/22 10:44	1
13C4 PFOS	77		25 - 150	12/05/22 20:45	12/07/22 10:44	1
d3-NMeFOSAA	75		25 - 150	12/05/22 20:45	12/07/22 10:44	1
d5-NEtFOSAA	81		25 - 150	12/05/22 20:45	12/07/22 10:44	1
13C3 HFPO-DA	78		25 - 150	12/05/22 20:45	12/07/22 10:44	1

Lab Sample ID: LCS 320-637659/2-A

Matrix: Solid

Analysis Batch: 638111

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 637659

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanoic acid (PFHxA)	2.00	2.07		ug/Kg		104	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	2.04		ug/Kg		102	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	2.09		ug/Kg		104	72 - 132
Perfluorononanoic acid (PFNA)	2.00	2.02		ug/Kg		101	73 - 133
Perfluorodecanoic acid (PFDA)	2.00	1.89		ug/Kg		95	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	2.10		ug/Kg		105	66 - 126
Perfluorododecanoic acid (PFDoA)	2.00	2.32		ug/Kg		116	71 - 131
Perfluorotridecanoic acid (PFTTrDA)	2.00	2.50		ug/Kg		125	71 - 131
Perfluorotetradecanoic acid (PFTeA)	2.00	2.25		ug/Kg		113	67 - 127
Perfluorobutanesulfonic acid (PFBS)	1.78	1.91		ug/Kg		108	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.85		ug/Kg		102	62 - 122
Perfluorooctanesulfonic acid (PFOS)	1.86	1.88		ug/Kg		101	68 - 141
NEtFOSAA	2.00	1.95		ug/Kg		98	72 - 132
NMeFOSAA	2.00	1.87		ug/Kg		93	72 - 132

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-637659/2-A

Matrix: Solid

Analysis Batch: 638111

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 637659

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
HFPO-DA (GenX)	2.00	2.03		ug/Kg		102	53 - 158
F-53B Major	1.87	2.02		ug/Kg		108	74 - 134
F-53B Minor	1.89	2.05		ug/Kg		108	66 - 136
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.89	2.19		ug/Kg		116	79 - 139

Isotope Dilution	LCS		Limits
	%Recovery	Qualifier	
13C2 PFHxA	82		25 - 150
13C4 PFHpA	81		25 - 150
13C4 PFOA	82		25 - 150
13C5 PFNA	86		25 - 150
13C2 PFDA	81		25 - 150
13C2 PFUnA	86		25 - 150
13C2 PFDoA	75		25 - 150
13C2 PFTeDA	84		25 - 150
13C3 PFBS	80		25 - 150
18O2 PFHxS	78		25 - 150
13C4 PFOS	79		25 - 150
d3-NMeFOSAA	82		25 - 150
d5-NEtFOSAA	85		25 - 150
13C3 HFPO-DA	76		25 - 150

QC Association Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

LCMS

Prep Batch: 636892

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-94720-1	FP-MW5-11212022	Total/NA	Water	3535	
320-94720-2 - DL	FP-MW4-11212022	Total/NA	Water	3535	
320-94720-2	FP-MW4-11212022	Total/NA	Water	3535	
320-94720-3	FP-MW100-11212022	Total/NA	Water	3535	
320-94720-3 - DL	FP-MW100-11212022	Total/NA	Water	3535	
320-94720-4	EB-1-11222022	Total/NA	Water	3535	
320-94720-5	EB-2-11222022	Total/NA	Water	3535	
320-94720-6	FP-MW3-11232022	Total/NA	Water	3535	
320-94720-6 - DL	FP-MW3-11232022	Total/NA	Water	3535	
320-94720-8 - DL	FP-MW2-11232022	Total/NA	Water	3535	
320-94720-8	FP-MW2-11232022	Total/NA	Water	3535	
MB 320-636892/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-636892/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-636892/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Prep Batch: 637659

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-94720-7	DRUM-COMP-SOIL	Total/NA	Solid	SHAKE	
MB 320-637659/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-637659/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	

Analysis Batch: 638111

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-94720-7	DRUM-COMP-SOIL	Total/NA	Solid	537 (modified)	637659
MB 320-637659/1-A	Method Blank	Total/NA	Solid	537 (modified)	637659
LCS 320-637659/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	637659

Analysis Batch: 639023

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-94720-1	FP-MW5-11212022	Total/NA	Water	537 (modified)	636892
320-94720-2	FP-MW4-11212022	Total/NA	Water	537 (modified)	636892
320-94720-3	FP-MW100-11212022	Total/NA	Water	537 (modified)	636892
320-94720-4	EB-1-11222022	Total/NA	Water	537 (modified)	636892
320-94720-5	EB-2-11222022	Total/NA	Water	537 (modified)	636892
320-94720-6	FP-MW3-11232022	Total/NA	Water	537 (modified)	636892
320-94720-8	FP-MW2-11232022	Total/NA	Water	537 (modified)	636892
MB 320-636892/1-A	Method Blank	Total/NA	Water	537 (modified)	636892
LCS 320-636892/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	636892
LCSD 320-636892/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	636892

Analysis Batch: 639827

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-94720-2 - DL	FP-MW4-11212022	Total/NA	Water	537 (modified)	636892
320-94720-3 - DL	FP-MW100-11212022	Total/NA	Water	537 (modified)	636892
320-94720-6 - DL	FP-MW3-11232022	Total/NA	Water	537 (modified)	636892
320-94720-8 - DL	FP-MW2-11232022	Total/NA	Water	537 (modified)	636892

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QC Association Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

General Chemistry

Analysis Batch: 636173

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-94720-7	DRUM-COMP-SOIL	Total/NA	Solid	D 2216	

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Client Sample ID: FP-MW5-11212022

Lab Sample ID: 320-94720-1

Date Collected: 11/21/22 12:40

Matrix: Water

Date Received: 11/29/22 09:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			267.4 mL	10.0 mL	636892	12/02/22 12:46	SEY	EET SAC
Total/NA	Analysis	537 (modified)		1	1 mL	1 mL	639023	12/12/22 02:51	S1M	EET SAC

Client Sample ID: FP-MW4-11212022

Lab Sample ID: 320-94720-2

Date Collected: 11/21/22 17:05

Matrix: Water

Date Received: 11/29/22 09:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			271.1 mL	10.0 mL	636892	12/02/22 12:46	SEY	EET SAC
Total/NA	Analysis	537 (modified)		1	1 mL	1 mL	639023	12/12/22 03:21	S1M	EET SAC
Total/NA	Prep	3535	DL		271.1 mL	10.0 mL	636892	12/02/22 12:46	SEY	EET SAC
Total/NA	Analysis	537 (modified)	DL	100	1 mL	1 mL	639827	12/13/22 18:27	S1M	EET SAC

Client Sample ID: FP-MW100-11212022

Lab Sample ID: 320-94720-3

Date Collected: 11/21/22 20:00

Matrix: Water

Date Received: 11/29/22 09:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			270.6 mL	10.0 mL	636892	12/02/22 12:46	SEY	EET SAC
Total/NA	Analysis	537 (modified)		1	1 mL	1 mL	639023	12/12/22 03:31	S1M	EET SAC
Total/NA	Prep	3535	DL		270.6 mL	10.0 mL	636892	12/02/22 12:46	SEY	EET SAC
Total/NA	Analysis	537 (modified)	DL	100	1 mL	1 mL	639827	12/13/22 18:38	S1M	EET SAC

Client Sample ID: EB-1-11222022

Lab Sample ID: 320-94720-4

Date Collected: 11/22/22 10:30

Matrix: Water

Date Received: 11/29/22 09:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			271 mL	10.0 mL	636892	12/02/22 12:46	SEY	EET SAC
Total/NA	Analysis	537 (modified)		1	1 mL	1 mL	639023	12/12/22 03:42	S1M	EET SAC

Client Sample ID: EB-2-11222022

Lab Sample ID: 320-94720-5

Date Collected: 11/22/22 15:15

Matrix: Water

Date Received: 11/29/22 09:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			271.5 mL	10.0 mL	636892	12/02/22 12:46	SEY	EET SAC
Total/NA	Analysis	537 (modified)		1	1 mL	1 mL	639023	12/12/22 03:52	S1M	EET SAC

Client Sample ID: FP-MW3-11232022

Lab Sample ID: 320-94720-6

Date Collected: 11/23/22 10:40

Matrix: Water

Date Received: 11/29/22 09:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			277.6 mL	10.0 mL	636892	12/02/22 12:46	SEY	EET SAC
Total/NA	Analysis	537 (modified)		1	1 mL	1 mL	639023	12/12/22 04:02	S1M	EET SAC

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Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Client Sample ID: FP-MW3-11232022

Lab Sample ID: 320-94720-6

Date Collected: 11/23/22 10:40

Matrix: Water

Date Received: 11/29/22 09:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535	DL		277.6 mL	10.0 mL	636892	12/02/22 12:46	SEY	EET SAC
Total/NA	Analysis	537 (modified)	DL	100	1 mL	1 mL	639827	12/13/22 18:48	S1M	EET SAC

Client Sample ID: DRUM-COMP-SOIL

Lab Sample ID: 320-94720-7

Date Collected: 11/23/22 12:00

Matrix: Solid

Date Received: 11/29/22 09:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			636173	11/30/22 10:26	DAN	EET SAC

Client Sample ID: DRUM-COMP-SOIL

Lab Sample ID: 320-94720-7

Date Collected: 11/23/22 12:00

Matrix: Solid

Date Received: 11/29/22 09:20

Percent Solids: 88.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.31 g	10.0 mL	637659	12/05/22 20:45	FX	EET SAC
Total/NA	Analysis	537 (modified)		1	1 mL	1 mL	638111	12/07/22 11:04	K1S	EET SAC

Client Sample ID: FP-MW2-11232022

Lab Sample ID: 320-94720-8

Date Collected: 11/23/22 12:05

Matrix: Water

Date Received: 11/29/22 09:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			280.9 mL	10.0 mL	636892	12/02/22 12:46	SEY	EET SAC
Total/NA	Analysis	537 (modified)		1	1 mL	1 mL	639023	12/12/22 04:12	S1M	EET SAC
Total/NA	Prep	3535	DL		280.9 mL	10.0 mL	636892	12/02/22 12:46	SEY	EET SAC
Total/NA	Analysis	537 (modified)	DL	20	1 mL	1 mL	639827	12/13/22 18:07	S1M	EET SAC

Laboratory References:

EET SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Laboratory: Eurofins Sacramento

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Oregon	NELAP	4040	01-29-23

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
D 2216		Solid	Percent Moisture
D 2216		Solid	Percent Solids
Washington	State	C581	05-05-23

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
D 2216		Solid	Percent Moisture
D 2216		Solid	Percent Solids

Method Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	EET SAC
D 2216	Percent Moisture	ASTM	EET SAC
3535	Solid-Phase Extraction (SPE)	SW846	EET SAC
SHAKE	Shake Extraction with Ultrasonic Bath Extraction	SW846	EET SAC

Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-94720-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-94720-1	FP-MW5-11212022	Water	11/21/22 12:40	11/29/22 09:20
320-94720-2	FP-MW4-11212022	Water	11/21/22 17:05	11/29/22 09:20
320-94720-3	FP-MW100-11212022	Water	11/21/22 20:00	11/29/22 09:20
320-94720-4	EB-1-11222022	Water	11/22/22 10:30	11/29/22 09:20
320-94720-5	EB-2-11222022	Water	11/22/22 15:15	11/29/22 09:20
320-94720-6	FP-MW3-11232022	Water	11/23/22 10:40	11/29/22 09:20
320-94720-7	DRUM-COMP-SOIL	Solid	11/23/22 12:00	11/29/22 09:20
320-94720-8	FP-MW2-11232022	Water	11/23/22 12:05	11/29/22 09:20

602623  eurofins

Environment Testing
TestAmerica

Address: _____

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☒ Other: with Dept Ecology

TAL-8210

[illegible]

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12/21/2022

Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 320-94720-1

Login Number: 94720

List Source: Eurofins Sacramento

List Number: 1

Creator: Her, David A

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.		
The cooler's custody seal, if present, is intact.		
Sample custody seals, if present, are intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the containers received and the COC.		
Samples are received within Holding Time (excluding tests with immediate HTs)		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified.		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Residual Chlorine Checked.		



ANALYTICAL REPORT

PREPARED FOR

Attn: Ryan Peterson
Shannon & Wilson, Inc
400 N. 34th Suite 100
PO BOX 300303
Seattle, Washington 98103

Generated 1/17/2023 2:00:12 PM

JOB DESCRIPTION

Paine Field

JOB NUMBER

320-95325-1

Eurofins Sacramento

Job Notes

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The data in the report relate to the field sample(s) as received by the laboratory and associated QC. All results have been reviewed and have been found to be compliant with laboratory and accreditation requirements, with the exception of the noted deviation(s). For questions, please contact the Project Manager.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Northern California, LLC Project Manager.

Authorization



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1/17/2023 2:00:12 PM

Authorized for release by
David Alltucker, Project Manager I
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(916)374-4383

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Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-95325-1

Qualifiers

LCMS

Qualifier	Qualifier Description
*5-	Isotope dilution analyte is outside acceptance limits, low biased.
E	Result exceeded calibration range.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-95325-1

Job ID: 320-95325-1

Laboratory: Eurofins Sacramento

Narrative

Job Narrative 320-95325-1

Comments

No additional comments.

Receipt

The sample was received on 12/15/2022 9:20 AM. Unless otherwise noted below, the sample arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.6° C.

LCMS

Method 537 (modified): The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: FP-MW1-12142022 (320-95325-1). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples.

Method 537 (modified): Results for samples FP-MW1-12142022 (320-95325-1) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits

Method 537 (modified): The concentration of analyte associated with the following samples exceeded the instrument calibration range: FP-MW1-12142022 (320-95325-1). These analytes have been qualified; however, the peak(s) did not saturate the instrument detector. Historical data indicate that for the isotope dilution method, dilution and re-analysis will not produce significantly different results from those reported above the calibration range. The sample was run at the maximum dilution allowed for the method.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

Method 3535: During the solid phase extraction process, the following samples contained non-settable particulates which clogged the solid phase extraction column: FP-MW1-12142022 (320-95325-1).
preparation batch 320-642850

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-95325-1

Client Sample ID: FP-MW1-12142022

Lab Sample ID: 320-95325-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorodecanoic acid (PFDA)	18		1.8	0.28	ng/L	1		537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	1.1	J	1.8	0.98	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	2000		180	52	ng/L	100		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	520		180	22	ng/L	100		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	1300		180	76	ng/L	100		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA) - DL	5100		180	24	ng/L	100		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	670		180	18	ng/L	100		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	9400		180	51	ng/L	100		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	80000	E	180	48	ng/L	100		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

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Client Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-95325-1

Client Sample ID: FP-MW1-12142022

Lab Sample ID: 320-95325-1

Date Collected: 12/14/22 12:20

Matrix: Water

Date Received: 12/15/22 09:20

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorodecanoic acid (PFDA)	18		1.8	0.28	ng/L		12/27/22 13:16	12/31/22 11:29	1
Perfluoroundecanoic acid (PFUnA)	1.1	J	1.8	0.98	ng/L		12/27/22 13:16	12/31/22 11:29	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.49	ng/L		12/27/22 13:16	12/31/22 11:29	1
Perfluorotridecanoic acid (PFTTrDA)	ND		1.8	1.2	ng/L		12/27/22 13:16	12/31/22 11:29	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.65	ng/L		12/27/22 13:16	12/31/22 11:29	1
NEtFOSAA	ND		4.5	1.2	ng/L		12/27/22 13:16	12/31/22 11:29	1
NMeFOSAA	ND		4.5	1.1	ng/L		12/27/22 13:16	12/31/22 11:29	1
HFPO-DA (GenX)	ND		3.6	1.3	ng/L		12/27/22 13:16	12/31/22 11:29	1
F-53B Major	ND		1.8	0.21	ng/L		12/27/22 13:16	12/31/22 11:29	1
F-53B Minor	ND		1.8	0.29	ng/L		12/27/22 13:16	12/31/22 11:29	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.8	0.36	ng/L		12/27/22 13:16	12/31/22 11:29	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	74		25 - 150	12/27/22 13:16	12/31/22 11:29	1
13C4 PFHpA	57		25 - 150	12/27/22 13:16	12/31/22 11:29	1
13C4 PFOA	70		25 - 150	12/27/22 13:16	12/31/22 11:29	1
13C5 PFNA	23	*5-	25 - 150	12/27/22 13:16	12/31/22 11:29	1
13C2 PFDA	78		25 - 150	12/27/22 13:16	12/31/22 11:29	1
13C2 PFUnA	78		25 - 150	12/27/22 13:16	12/31/22 11:29	1
13C2 PFDoA	63		25 - 150	12/27/22 13:16	12/31/22 11:29	1
13C2 PFTeDA	60		25 - 150	12/27/22 13:16	12/31/22 11:29	1
13C3 PFBS	68		25 - 150	12/27/22 13:16	12/31/22 11:29	1
18O2 PFHxS	63		25 - 150	12/27/22 13:16	12/31/22 11:29	1
13C4 PFOS	22	*5-	25 - 150	12/27/22 13:16	12/31/22 11:29	1
d3-NMeFOSAA	73		25 - 150	12/27/22 13:16	12/31/22 11:29	1
d5-NEtFOSAA	75		25 - 150	12/27/22 13:16	12/31/22 11:29	1
13C3 HFPO-DA	81		25 - 150	12/27/22 13:16	12/31/22 11:29	1

Method: EPA 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	2000		180	52	ng/L		12/27/22 13:16	01/06/23 09:26	100
Perfluoroheptanoic acid (PFHpA)	520		180	22	ng/L		12/27/22 13:16	01/06/23 09:26	100
Perfluorooctanoic acid (PFOA)	1300		180	76	ng/L		12/27/22 13:16	01/06/23 09:26	100
Perfluorononanoic acid (PFNA)	5100		180	24	ng/L		12/27/22 13:16	01/06/23 09:26	100
Perfluorobutanesulfonic acid (PFBS)	670		180	18	ng/L		12/27/22 13:16	01/06/23 09:26	100
Perfluorohexanesulfonic acid (PFHxS)	9400		180	51	ng/L		12/27/22 13:16	01/06/23 09:26	100
Perfluorooctanesulfonic acid (PFOS)	80000	E	180	48	ng/L		12/27/22 13:16	01/06/23 09:26	100

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	76		25 - 150	12/27/22 13:16	01/06/23 09:26	100
13C4 PFHpA	69		25 - 150	12/27/22 13:16	01/06/23 09:26	100
13C4 PFOA	81		25 - 150	12/27/22 13:16	01/06/23 09:26	100
13C5 PFNA	78		25 - 150	12/27/22 13:16	01/06/23 09:26	100
13C3 PFBS	81		25 - 150	12/27/22 13:16	01/06/23 09:26	100
18O2 PFHxS	84		25 - 150	12/27/22 13:16	01/06/23 09:26	100
13C4 PFOS	66		25 - 150	12/27/22 13:16	01/06/23 09:26	100

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Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-95325-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Water

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFHxA (25-150)	C4PFHA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)	PFDaA (25-150)	PFTDA (25-150)
320-95325-1	FP-MW1-12142022	74	57	70	23 *5-	78	78	63	60
320-95325-1 - DL	FP-MW1-12142022	76	69	81	78				
LCS 320-642850/2-A	Lab Control Sample	103	103	106	100	103	103	87	91
LCSD 320-642850/3-A	Lab Control Sample Dup	110	109	110	106	109	108	97	97
MB 320-642850/1-A	Method Blank	106	110	113	107	107	105	92	94

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	C3PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	d3NMFOS (25-150)	d5NEFOS (25-150)	HFPODA (25-150)
320-95325-1	FP-MW1-12142022	68	63	22 *5-	73	75	81
320-95325-1 - DL	FP-MW1-12142022	81	84	66			
LCS 320-642850/2-A	Lab Control Sample	96	96	95	99	100	106
LCSD 320-642850/3-A	Lab Control Sample Dup	107	108	108	104	102	108
MB 320-642850/1-A	Method Blank	102	104	97	101	101	109

Surrogate Legend

PFHxA = 13C2 PFHxA
C4PFHA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA
PFUnA = 13C2 PFUnA
PFDaA = 13C2 PFDaA
PFTDA = 13C2 PFTeDA
C3PFBS = 13C3 PFBS
PFHxS = 18O2 PFHxS
PFOS = 13C4 PFOS
d3NMFOS = d3-NMeFOSAA
d5NEFOS = d5-NEtFOSAA
HFPODA = 13C3 HFPO-DA

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-95325-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-642850/1-A

Matrix: Water

Analysis Batch: 644036

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 642850

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.58	ng/L		12/27/22 13:16	12/31/22 09:37	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.25	ng/L		12/27/22 13:16	12/31/22 09:37	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.85	ng/L		12/27/22 13:16	12/31/22 09:37	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.27	ng/L		12/27/22 13:16	12/31/22 09:37	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.31	ng/L		12/27/22 13:16	12/31/22 09:37	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		12/27/22 13:16	12/31/22 09:37	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.55	ng/L		12/27/22 13:16	12/31/22 09:37	1
Perfluorotridecanoic acid (PFTTrDA)	ND		2.0	1.3	ng/L		12/27/22 13:16	12/31/22 09:37	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.73	ng/L		12/27/22 13:16	12/31/22 09:37	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.20	ng/L		12/27/22 13:16	12/31/22 09:37	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.57	ng/L		12/27/22 13:16	12/31/22 09:37	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	0.54	ng/L		12/27/22 13:16	12/31/22 09:37	1
NEtFOSAA	ND		5.0	1.3	ng/L		12/27/22 13:16	12/31/22 09:37	1
NMeFOSAA	ND		5.0	1.2	ng/L		12/27/22 13:16	12/31/22 09:37	1
HFPO-DA (GenX)	ND		4.0	1.5	ng/L		12/27/22 13:16	12/31/22 09:37	1
F-53B Major	ND		2.0	0.24	ng/L		12/27/22 13:16	12/31/22 09:37	1
F-53B Minor	ND		2.0	0.32	ng/L		12/27/22 13:16	12/31/22 09:37	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0	0.40	ng/L		12/27/22 13:16	12/31/22 09:37	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	106		25 - 150	12/27/22 13:16	12/31/22 09:37	1
13C4 PFHpA	110		25 - 150	12/27/22 13:16	12/31/22 09:37	1
13C4 PFOA	113		25 - 150	12/27/22 13:16	12/31/22 09:37	1
13C5 PFNA	107		25 - 150	12/27/22 13:16	12/31/22 09:37	1
13C2 PFDA	107		25 - 150	12/27/22 13:16	12/31/22 09:37	1
13C2 PFUnA	105		25 - 150	12/27/22 13:16	12/31/22 09:37	1
13C2 PFDoA	92		25 - 150	12/27/22 13:16	12/31/22 09:37	1
13C2 PFTeDA	94		25 - 150	12/27/22 13:16	12/31/22 09:37	1
13C3 PFBS	102		25 - 150	12/27/22 13:16	12/31/22 09:37	1
18O2 PFHxS	104		25 - 150	12/27/22 13:16	12/31/22 09:37	1
13C4 PFOS	97		25 - 150	12/27/22 13:16	12/31/22 09:37	1
d3-NMeFOSAA	101		25 - 150	12/27/22 13:16	12/31/22 09:37	1
d5-NEtFOSAA	101		25 - 150	12/27/22 13:16	12/31/22 09:37	1
13C3 HFPO-DA	109		25 - 150	12/27/22 13:16	12/31/22 09:37	1

Lab Sample ID: LCS 320-642850/2-A

Matrix: Water

Analysis Batch: 644036

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 642850

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorohexanoic acid (PFHxA)	40.0	42.0		ng/L		105	73 - 133
Perfluoroheptanoic acid (PFHpA)	40.0	42.9		ng/L		107	72 - 132
Perfluorooctanoic acid (PFOA)	40.0	40.5		ng/L		101	70 - 130
Perfluorononanoic acid (PFNA)	40.0	46.1		ng/L		115	75 - 135
Perfluorodecanoic acid (PFDA)	40.0	44.6		ng/L		112	76 - 136
Perfluoroundecanoic acid (PFUnA)	40.0	43.1		ng/L		108	68 - 128

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-95325-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-642850/2-A

Matrix: Water

Analysis Batch: 644036

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 642850

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorododecanoic acid (PFDoA)	40.0	45.0		ng/L		113	71 - 131
Perfluorotridecanoic acid (PFTrDA)	40.0	45.6		ng/L		114	71 - 131
Perfluorotetradecanoic acid (PFTeA)	40.0	45.1		ng/L		113	70 - 130
Perfluorobutanesulfonic acid (PFBS)	35.5	38.4		ng/L		108	67 - 127
Perfluorohexanesulfonic acid (PFHxS)	36.5	37.5		ng/L		103	59 - 119
Perfluorooctanesulfonic acid (PFOS)	37.2	40.9		ng/L		110	70 - 130
NEtFOSAA	40.0	45.9		ng/L		115	76 - 136
NMeFOSAA	40.0	44.9		ng/L		112	76 - 136
HFPO-DA (GenX)	40.0	43.4		ng/L		108	51 - 173
F-53B Major	37.4	40.1		ng/L		107	75 - 135
F-53B Minor	37.8	41.9		ng/L		111	54 - 114
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	37.8	43.6		ng/L		115	79 - 139

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C2 PFHxA	103		25 - 150
13C4 PFHpA	103		25 - 150
13C4 PFOA	106		25 - 150
13C5 PFNA	100		25 - 150
13C2 PFDA	103		25 - 150
13C2 PFUnA	103		25 - 150
13C2 PFDoA	87		25 - 150
13C2 PFTeDA	91		25 - 150
13C3 PFBS	96		25 - 150
18O2 PFHxS	96		25 - 150
13C4 PFOS	95		25 - 150
d3-NMeFOSAA	99		25 - 150
d5-NEtFOSAA	100		25 - 150
13C3 HFPO-DA	106		25 - 150

Lab Sample ID: LCSD 320-642850/3-A

Matrix: Water

Analysis Batch: 645896

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 642850

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	40.0	42.6		ng/L		107	73 - 133	2	30
Perfluoroheptanoic acid (PFHpA)	40.0	43.6		ng/L		109	72 - 132	2	30
Perfluorooctanoic acid (PFOA)	40.0	45.2		ng/L		113	70 - 130	11	30
Perfluorononanoic acid (PFNA)	40.0	44.8		ng/L		112	75 - 135	3	30
Perfluorodecanoic acid (PFDA)	40.0	41.7		ng/L		104	76 - 136	7	30
Perfluoroundecanoic acid (PFUnA)	40.0	44.0		ng/L		110	68 - 128	2	30
Perfluorododecanoic acid (PFDoA)	40.0	48.5		ng/L		121	71 - 131	7	30

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QC Sample Results

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-95325-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 320-642850/3-A

Matrix: Water

Analysis Batch: 645896

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 642850

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluorotridecanoic acid (PFTrDA)	40.0	45.0		ng/L		112	71 - 131	1	30
Perfluorotetradecanoic acid (PFTeA)	40.0	40.5		ng/L		101	70 - 130	11	30
Perfluorobutanesulfonic acid (PFBS)	35.5	39.2		ng/L		110	67 - 127	2	30
Perfluorohexanesulfonic acid (PFHxS)	36.5	35.9		ng/L		98	59 - 119	4	30
Perfluorooctanesulfonic acid (PFOS)	37.2	36.9		ng/L		99	70 - 130	10	30
NEtFOSAA	40.0	44.1		ng/L		110	76 - 136	4	30
NMeFOSAA	40.0	43.9		ng/L		110	76 - 136	2	30
HFPO-DA (GenX)	40.0	38.7		ng/L		97	51 - 173	11	30
F-53B Major	37.4	40.7		ng/L		109	75 - 135	2	30
F-53B Minor	37.8	42.4		ng/L		112	54 - 114	1	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	37.8	42.5		ng/L		112	79 - 139	3	30

Isotope Dilution	LCSD		Limits
	%Recovery	Qualifier	
13C2 PFHxA	110		25 - 150
13C4 PFHpA	109		25 - 150
13C4 PFOA	110		25 - 150
13C5 PFNA	106		25 - 150
13C2 PFDA	109		25 - 150
13C2 PFUnA	108		25 - 150
13C2 PFDoA	97		25 - 150
13C2 PFTeDA	97		25 - 150
13C3 PFBS	107		25 - 150
18O2 PFHxS	108		25 - 150
13C4 PFOS	108		25 - 150
d3-NMeFOSAA	104		25 - 150
d5-NEtFOSAA	102		25 - 150
13C3 HFPO-DA	108		25 - 150

Eurofins Sacramento

QC Association Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-95325-1

LCMS

Prep Batch: 642850

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-95325-1 - DL	FP-MW1-12142022	Total/NA	Water	3535	
320-95325-1	FP-MW1-12142022	Total/NA	Water	3535	
MB 320-642850/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-642850/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-642850/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 644036

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-95325-1	FP-MW1-12142022	Total/NA	Water	537 (modified)	642850
MB 320-642850/1-A	Method Blank	Total/NA	Water	537 (modified)	642850
LCS 320-642850/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	642850

Analysis Batch: 644770

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-95325-1 - DL	FP-MW1-12142022	Total/NA	Water	537 (modified)	642850

Analysis Batch: 645896

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 320-642850/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	642850

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-95325-1

Client Sample ID: FP-MW1-12142022

Lab Sample ID: 320-95325-1

Date Collected: 12/14/22 12:20

Matrix: Water

Date Received: 12/15/22 09:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535	DL		280.5 mL	10.0 mL	642850	12/27/22 13:16	SEY	EET SAC
Total/NA	Analysis	537 (modified)	DL	100	1 mL	1 mL	644770	01/06/23 09:26	RS1	EET SAC
Total/NA	Prep	3535			280.5 mL	10.0 mL	642850	12/27/22 13:16	SEY	EET SAC
Total/NA	Analysis	537 (modified)		1	1 mL	1 mL	644036	12/31/22 11:29	K1S	EET SAC

Laboratory References:

EET SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-95325-1

Laboratory: Eurofins Sacramento

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Oregon	NELAP	4040	01-29-23
Washington	State	C581	05-05-23

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Method Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-95325-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	EET SAC
3535	Solid-Phase Extraction (SPE)	SW846	EET SAC

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Shannon & Wilson, Inc
Project/Site: Paine Field

Job ID: 320-95325-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-95325-1	FP-MW1-12142022	Water	12/14/22 12:20	12/15/22 09:20

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

Address:

[illegible]

Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 320-95325-1

Login Number: 95325

List Source: Eurofins Sacramento

List Number: 1

Creator: Oropeza, Salvador

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	SEAL
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Appendix F

Quality Assurance/Quality Control of Analytical Data

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Attachments

Attachment F-1: Laboratory Data Review Checklist, Work Order 320-88345-1 (12 pages)
Attachment F-2: Laboratory Data Review Checklist, Work Order 320-88632-1 (11 pages)
Attachment F-3: Laboratory Data Review Checklist, Work Order 320-94720-1 (11 pages)
Attachment F-4: Laboratory Data Review Checklist, Work Order 320-95325-1 (11 pages)

F.1 INTRODUCTION

This quality assurance (QA)/quality control (QC) summary outlines the technical review of analytical results generated in support of initial per- and polyfluoroalkyl substances (PFAS) site investigation activities at and near the former Fire Training Pit at Snohomish County Airport in Everett, Washington. Soil and water sampling data are summarized below. Laboratory analytical reports are attached as Appendix D to the main report.

Shannon & Wilson reviewed project and QC analytical data to assess whether the data met the designated quality objectives and were acceptable for project use. The review included evaluation of the following: sample collection and handling, holding times, blanks (to assess contamination), project sample and laboratory quality control sample duplicates (to assess precision), laboratory control samples (LCSs) and sample isotope dilution analyte (IDA) recoveries (to assess accuracy), and matrix spike sample (MS) recoveries (to assess matrix effects). Calibration curves exceedances and transition mass ratio failures were not reviewed unless a QC discrepancy was noted by the laboratory in a case narrative. QC deviations that do not impact data quality (e.g., high LCS recovery associated with non-detect results), are not discussed. More elaborate data quality descriptions are reported in the Laboratory Data Review Checklists (LDRCs), which are enclosed in this appendix.

Sample results and method detection limits for non-detect results were compared to the human and ecological screening levels defined in the Washington State Department of Ecology Draft Guidance.¹ Applicable data quality indicators are discussed for each method under separate subheadings. Data that did not meet acceptance criteria have been described and the associated samples and data quality implications or qualifications are summarized.

F.2 ANALYTICAL METHODS AND DATA QUALITY OBJECTIVES

The analytical methods and associated data quality objectives (DQOs) used for this review were established in the proposal and discussed in this appendix. The DQOs represent the minimum acceptable QC limits and goals for analytical measurements and are used as comparison criteria during data quality review to determine both the quality and usability of the analytical data.

The six DQOs used for this review were accuracy, precision, representativeness, comparability, sensitivity, and completeness.

¹ Washington State Department of Ecology (Ecology), 2022, Draft guidance for investigating and remediating PFAS contamination in Washington State: prepared by Washington State Department of Ecology, Toxics Cleanup Program, Olympia, Wash., publication no. 22-09-058, December.

- Accuracy measures the correctness, or the closeness, between the true value and the quantity detected. It is measured by calculating the percent recovery of known concentrations of spiked compounds that were introduced into the appropriate sample matrix. Isotope dilution analytes (IDAs), LCS, and MS sample recoveries were used to measure accuracy for this project.
- Precision measures the reproducibility of repetitive measurements. It is measured by calculating the relative percent difference (RPD) between duplicate samples. Field duplicate samples, MS and matrix spike duplicate sample (MSD) sample pairs, and LCS and laboratory control sample duplicate (LCSD) pairs were used to measure precision for this project.
- Representativeness describes the degree to which data accurately and precisely represents site characteristics. This is addressed in more detail in the following section(s).
- Comparability describes whether two data sets can be considered equivalent with respect to the project goal. This is addressed in more detail in the following section(s).
- Sensitivity describes the lowest concentration that the analytical method can reliably quantitate and is evaluated by verifying that the detected results and/or limit of detection/reporting levels meet the project-specific screening levels.
- Completeness describes the amount of valid data obtained from the sampling event(s). It is calculated as the percentage of valid measurements compared to the total number of measurements. The completeness goal for this project was set at 90%.

In addition to these criteria for the six DQOs described above, sample collection and handling procedures and blank samples were reviewed to ensure overall data quality. Sample handling was reviewed to assess parameters such as chain-of-custody (COC) documentation, the use of appropriate sample containers and preservatives, shipment cooler temperature, and method-specified sample holding times. Each of these parameters contributes to the general representativeness and comparability of the project data. The combination of evaluations of the above-mentioned parameters will lead to a determination of the overall project data completeness.

F.3 SUMMARY OF SAMPLES

Project and QC samples were analyzed by Eurofins Environmental Testing Laboratory of West Sacramento, California. Samples were collected from May 2022 through December 2022.

A total of 30 primary soil samples were collected and 5 field duplicate samples.

A total of 13 primary water samples were collected and 2 field duplicate samples.

Samples were submitted under the laboratory work order (WO) numbers identified in Exhibit F-1.

Exhibit F-1: Laboratory Work Order Summary

Laboratory WO	Primary/Duplicate Samples
320-88345	FP-P7:0.5 / FP-P100:0.5
	FP-P8:1.5 / FP-P101:1.5
	FP-MW1:0.4 / FP-MW100:0.4
	FP-MW2:0.5 / FP-MW101:0.5
	FP-MW3:0.5 / FP-MW102:0.5
320-88632	FP-MW1:GW / FP-MW100:GW
320-94720	FP-MW4-11212022 / FP-MW100-11212022
320-95325	No Duplicates

The laboratory reports are provided in Appendix D and associated LDRCs are enclosed in this appendix.

F.4 DATA QUALITY REVIEW

This section presents the findings of the data quality review and the resulting data qualifications for project samples. See the associated LDRCs enclosed in this appendix for more elaborate data quality descriptions.

F.4.1 Sample Handling

The evaluation of proper sample handling procedures includes verification of the following: correct COC documentation, appropriate sample containers and preservatives, cooler temperatures maintained within the recommended temperature range (0 to 6 degrees Celsius [°C]), and sample analyses performed within method-specified holding times. No sample handling discrepancies were noted upon receipt at the laboratory, which resulted in data qualification. See the associated LDRC checklist for a more detailed discussion.

F.4.2 Method Blanks

Method blanks were utilized to detect potential laboratory cross-contamination of project samples. Samples are considered affected if they are detected within ten times the concentration of the detection in the method blank. Samples were analyzed in every batch, as required. There were no method blank detections that resulted in data qualifications to the project samples. See the associated LDRC checklist for a more detailed discussion.

F.4.3 Laboratory Control Samples

The LCS/LCSD samples were prepared by adding spike compounds to blank samples in order to assess laboratory extraction and instrumentation performance. The LCS/LCSD recoveries and/or RPDs were within laboratory and project limits and did not result in qualification of the data. See the associated LDRC checklist for a more detailed discussion.

F.4.4 Matrix Spike Samples

MS samples are prepared by adding spike compounds to project samples to assess potential matrix interference. The MS/MSD and/or RPDs were within laboratory and project limits and did not result in qualification of the data with the following exception.

- WO 320-88345
 - The PFAS MS and MSD had high recovery failures for perfluorohexanoic acid (PFHxA), perfluorononanoic acid (PFNA), and perfluorooctanoic acid (PFOA). The parent sample *FP-P7:0.5* and field-duplicate pair *FP-P100:0.5* are considered estimated, biased high, and are flagged “JH” to identify the QC failure.

Additional MS/MSD recovery failures were observed for the project samples but did not result in qualification of the data. See the associated LDRC checklist for a more detailed discussion.

F.4.5 Isotope Dilution Analyte Recovery

IDA compounds were added to project samples by the laboratory prior to analysis, in accordance with method requirements. Recoveries were then calculated as percentages and reported by the laboratory as a measure of analytical extraction efficiency. Surrogate recoveries were inside the established control limits, with the following exception.

- WO 320-88345
 - The PFAS IDA associated with perfluorohexanesulfonic acid (PFHxS) a recovery failure for project sample *FP-P3:GW*. The associated analyte PFHxS is considered estimated, no direction of bias, and is flagged “J” to identify the QC failure.

Additional IDA recovery failures were observed for the project samples but did not result in qualification of the data. See the associated LDRC checklist for a more detailed discussion.

F.4.6 Field Duplicates

Field duplicate sample was collected and submitted to the laboratory as a blind sample in accordance with the overall project objectives. Field duplicate samples were collected at the required frequency for the overall project. Field duplicates met the project specified DQO of

50% for soil samples and 30% for water samples in all WOs and are considered comparable, with the following exceptions.

- WO 320-88345
 - The RPDs for field duplicate pair *FP-MW1:0.4* / *FP-MW100:0.4* were outside the DQO for perfluorotetradecanoic acid (PFTeA) and perfluorotridecanoic acid (PFTriA). These analyte results are considered estimated with no direction of bias and are flagged “J” to denote the imprecision.
 - The RPDs for field duplicate pair *FP-MW3:0.5* / *FP-MW102:0.5* were outside the DQO for PFHxA, PFNA, and perfluorooctanesulfonic acid (PFOS). These analyte results are considered estimated with no direction of bias and are flagged “J” to denote the imprecision.
 - The RPD for field duplicate pair *FP-P7:0.5* / *FP-P100:0.5* was outside the DQO for PFTeA. These analyte results are considered estimated with no direction of bias and are flagged “J” to denote the imprecision.
 - The RPDs for field duplicate pair *FP-P8:1.5* / *FP-P101:1.5* were outside the DQO for PFHxS, PFNA, and PFOS. These analyte results are considered estimated with no direction of bias and are flagged “J” to denote the imprecision.

F.4.7 Additional Flags

Additional QC failures that were not discussed above are assessed in this section.

- The laboratory noted that the PFOS results for samples *FP-MW1:0.4*, *FP-MW100:0.4*, *FP-MW1:GW*, *FP-MW100:GW*, *FP-MW4:GW*, *FP-MW3-11232022*, and *FP-MW1-12142022* exceeded the laboratory calibration range. The sample results for this analyte are considered estimated and are flagged “J” to identify the QC failure.
- The transition mass ratios were below the established ratio limits for PFOS in sample *FP-P1:10.2* and PFHxS in sample *FP-P3-1.2*. The qualitative identification of the analyte has some degree of uncertainty and are flagged “J” to identify the uncertainty.
- The transition mass ratios were above the established ratio limits for N-methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA) in samples *FP-P7:0.5* and *FP-P100:0.5*. The qualitative identification of the analyte has some degree of uncertainty, and the reported value may have some high bias. The results are flagged “JH” to identify the uncertainty and potential high bias.

F.5 SUMMARY OF QUALIFIED RESULTS

Overall, the data validation process deemed the project data acceptable for use with the minor exceptions noted above resulting in qualification of the data. We did not reject any analytical results due to failures with laboratory QC samples, sample handling, or other

issues. Flags can be found in the associated analytical summary tables and are summarized in Exhibit F-2.

Exhibit F-2: Flag Summary

Laboratory WO	Sample Name	Analyte	QC Flag	Bias	QC Note
320-88345	FP-P3:GW	Perfluorohexanesulfonic acid (PFHxS)	J	None	IDA recovery failure
320-88345	FP-P7:0.5	Perfluorohexanoic acid (PFHxA)	JH	High	MS/MSD recovery failure
320-88345	FP-P7:0.5	Perfluorononanoic acid (PFNA)	JH	High	MS/MSD recovery failure
320-88345	FP-P7:0.5	Perfluorooctanoic acid (PFOA)	JH	High	MS/MSD recovery failure
320-88345	FP-P100:0.5	Perfluorohexanoic acid (PFHxA)	JH	High	MS/MSD recovery failure
320-88345	FP-P100:0.5	Perfluorononanoic acid (PFNA)	JH	High	MS/MSD recovery failure
320-88345	FP-P100:0.5	Perfluorooctanoic acid (PFOA)	JH	High	MS/MSD recovery failure
320-88345	FP-MW1:0.4	Perfluorotetradecanoic acid (PFTeA)	J	None	Field duplicate RPD failure
320-88345	FP-MW1:0.4	Perfluorotridecanoic acid (PFTriA)	J	None	Field duplicate RPD failure
320-88345	FP-MW100:0.4	Perfluorotetradecanoic acid (PFTeA)	J	None	Field duplicate RPD failure
320-88345	FP-MW100:0.4	Perfluorotridecanoic acid (PFTriA)	J	None	Field duplicate RPD failure
320-88345	FP-MW102:0.5	Perfluorohexanoic acid (PFHxA)	J	None	Field duplicate RPD failure
320-88345	FP-MW102:0.5	Perfluorononanoic acid (PFNA)	J	None	Field duplicate RPD failure
320-88345	FP-MW102:0.5	Perfluorooctanesulfonic acid (PFOS)	J	None	Field duplicate RPD failure
320-88345	FP-MW3:0.5	Perfluorohexanoic acid (PFHxA)	J	None	Field duplicate RPD failure
320-88345	FP-MW3:0.5	Perfluorononanoic acid (PFNA)	J	None	Field duplicate RPD failure
320-88345	FP-MW3:0.5	Perfluorooctanesulfonic acid (PFOS)	J	None	Field duplicate RPD failure
320-88345	FP-P100:0.5	Perfluorotetradecanoic acid (PFTeA)	J	None	Field duplicate RPD failure
320-88345	FP-P7:0.5	Perfluorotetradecanoic acid (PFTeA)	J	None	Field duplicate RPD failure
320-88345	FP-P101:1.5	Perfluorohexanesulfonic acid (PFHxS)	J	None	Field duplicate RPD failure
320-88345	FP-P101:1.5	Perfluorononanoic acid (PFNA)	J	None	Field duplicate RPD failure
320-88345	FP-P101:1.5	Perfluorooctanesulfonic acid (PFOS)	J	None	Field duplicate RPD failure
320-88345	FP-P8:1.5	Perfluorohexanesulfonic acid (PFHxS)	J	None	Field duplicate RPD failure
320-88345	FP-P8:1.5	Perfluorononanoic acid (PFNA)	J	None	Field duplicate RPD failure
320-88345	FP-P8:1.5	Perfluorooctanesulfonic acid (PFOS)	J	None	Field duplicate RPD failure
320-88345	FP-MW1:0.4	Perfluorooctanesulfonic acid (PFOS)	J	None	Calibration range exceedance
320-88345	FP-MW100:0.4	Perfluorooctanesulfonic acid (PFOS)	J	None	Calibration range exceedance
320-88632	FP-MW1:GW	Perfluorooctanesulfonic acid (PFOS)	J	None	Calibration range exceedance

Laboratory WO	Sample Name	Analyte	QC Flag	Bias	QC Note
320-88632	FP-MW100:GW	Perfluorooctanesulfonic acid (PFOS)	J	None	Calibration range exceedance
320-88632	FP-MW4:GW	Perfluorooctanesulfonic acid (PFOS)	J	None	Calibration range exceedance
320-94720	FP-MW3-11232022	Perfluorooctanesulfonic acid (PFOS)	J	None	Calibration range exceedance
320-95325	FP-MW1-12142022	Perfluorooctanesulfonic acid (PFOS)	J	None	Calibration range exceedance
320-88345	FP-P1:10.2	Perfluorooctanesulfonic acid (PFOS)	J	None	Transition mass ratio failure
320-88345	FP-P3:1.2	Perfluorohexanesulfonic acid (PFHxS)	J	None	Transition mass ratio failure
320-88345	FP-P100:0.5	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	JH	High	Transition mass ratio failure
320-88345	FP-P7:0.5	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	JH	High	Transition mass ratio failure

F.6 COMPLETENESS

No data were rejected pursuant to the data quality review, and data may be used, as qualified, for the purposes of the project.

Attachment F-1

Laboratory Data Review Checklist, Work Order 320-88345-1 (12 pages)

APPENDIX F: QUALITY ASSURANCE/QUALITY CONTROL OF ANALYTICAL DATA

Laboratory Data Review Checklist

Completed By:

Christopher Hall

Title:

Environmental Scientist

Date:

3/17/2023

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

Eurofins Environment Testing

Laboratory Report Number:

320-88345-1

Laboratory Report Date:

7/1/2023

Report Name:

Paine Field

Project Number

102986-008

320-88345-1

Laboratory Report Date:

7/1/2023

Report Name:

Paine Field

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

- a. Did a WA State Ecology approved laboratory receive and perform all of the submitted sample analyses?

Yes ☒ No ☐ N/A ☐ Comments:

The project samples were submitted to Eurofins Environmental Testing of West Sacramento, California. The laboratory is a WA State Department of Ecology approved laboratory for the requested analyses (Accreditation # C851-22).

- b. If the samples were transferred to another “network” laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses WA State Ecology approved?

Yes ☐ No ☐ N/A ☒ Comments:

Sample analyses were not subcontracted or transferred to another laboratory.

2. Chain of Custody (CoC)

- a. CoC information completed, signed, and dated (including released/received by)?

Yes ☒ No ☐ N/A ☐ Comments:

- b. Correct analyses requested?

Yes ☒ No ☐ N/A ☐ Comments:

Per- and polyfluoroalkyl substances (PFAS) by the Modified Method 537.1 – 18 analytes

3. Laboratory Sample Receipt Documentation

- a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

Yes ☒ No ☐ N/A ☐ Comments:

The temperature of the 2 coolers were 1.6° C and 2.2° C at receipt by the laboratory.

- b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

Yes ☐ No ☐ N/A ☒ Comments:

PFAS does not require any additional preservation beyond temperature control.

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c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes ☒ No ☐ N/A ☐ Comments:

The laboratory noted the samples arrived in good condition.

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes ☒ No ☐ N/A ☐ Comments:

The container label for the following sample(s) did not match the information listed on the Chain-of-Custody (COC): Sample 35, container has ID FP-101:1.5. Missing P before 101. COC lists ID: FP-P101:1.5. Sample logged in and labeled according to COC. FP-P101:1.5 (320-88345-35).

e. Data quality or usability affected?

Comments:

Data quality or usability are not affected.

4. Case Narrative

a. Present and understandable?

Yes ☒ No ☐ N/A ☐ Comments:

b. Discrepancies, errors, or QC failures identified by the lab?

Yes ☒ No ☐ N/A ☐ Comments:

The method blank for preparation batch 320-592017 contained perfluorooctanesulfonic acid (PFOS) above the reporting limit (RL). Associated samples were not re-extracted and/or re-analyzed because results were greater than 10X the value found in the method blank. The samples *FP-P7:0.5* (320-88345-28), *FP-P7:7.0* (320-88345-29), *FP-P100:0.5* (320-88345-31), *FP-P8:1.5* (320-88345-32), *FP-P101:1.5* (320-88345-35), *FP-MW1:7.6* (320-88345-37), (MB 320-592017/1-A), (320-88345-A-28-B MS), and (320-88345-A-28-C MSD) are associated with the preparation batch. Refer to Section 6.a for further assessment.

The transition mass ratio was outside the established ratio limit for perfluoroundecanoic acid (PFUnA) associated to this data set. This is indicated by the "R" flag in the raw data. As the flagged data is in control in the CCVL, there is no adverse impact to the data. (CCVL 320-591400/2). The data quality and usability are not affected.

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The "I" qualifier means the transition mass ratio for the indicated analyte was below the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty. However, analyst judgment was used to positively identify the analyte. The sample *FP-P1:10.2* (320-88345-6) had a transition mass ratio failure for PFOS and sample *FP-P3:1.2* (320-88345-12) had a transition mass ratio failure for perfluorohexanesulfonic acid (PFHxS). These results are flagged "J" in the analytical summary tables to identify the uncertainty.

The "I" qualifier means the transition mass ratio for the indicated analyte was above the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty, and the reported value may have some high bias. However, analyst judgment was used to positively identify the analyte. The samples *FP-P7:0.5* (320-88345-28) and *FP-P100:0.5* (320-88345-31) had transition mass ratio failures for N-methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA). These results are flagged "JH" in the analytical summary tables to identify the potential high bias.

Results for sample *FP-P9:0.5* (320-88345-1), *FP-P9:6.5* (320-88345-2), *FP-P2:5.3* (320-88345-9), *FP-P2:GW* (320-88345-11), *FP-P3:GW* (320-88345-16), *FP-P4:GW* (320-88345-20), *FP-P6:0.5* (320-88345-25), *FP-P7:0.5* (320-88345-28), *FP-P7:7.0* (320-88345-29), *FP-P100:0.5* (320-88345-31), *FP-P101:1.5* (320-88345-35), *FP-MW1:7.6* (320-88345-37), (320-88345-A-28-B MS), and (320-88345-A-28-C MSD) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits. Sample results are not affected.

The concentration of PFOS exceeded the instrument calibration range for PFOS for samples *FP-MW1:0.4* (320-88345-36) and *FP-MW100:0.4* (320-88345-39). This analyte has been qualified; however, the peak(s) did not saturate the instrument detector. Historical data indicate that for the isotope dilution method, dilution and re-analysis will not produce significantly different results from those reported above the calibration range. Sample results are considered estimated, no direction of bias, and are flagged "J" in the analytical summary tables.

The isotope dilution analyte (IDA) perfluorohexanesulfonic acid (PFHxS) had a recovery that is above the method recommended limit for the sample *FP-P3:GW* (320-88345-16). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries. Refer to Section 6.d for further assessment.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 320-592017 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits. Refer to Section 6.c for further assessment.

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c. Were all corrective actions documented?

Yes ☒ No ☐ N/A ☐ Comments:

See above.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

The case narrative does not note an effect on data quality or usability. See the following sections for further assessment.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes ☒ No ☐ N/A ☐ Comments:

b. All applicable holding times met?

Yes ☒ No ☐ N/A ☐ Comments:

c. All soils reported on a dry weight basis?

Yes ☒ No ☐ N/A ☐ Comments:

d. Are the RLs less than the Cleanup Level or the minimum required detection level for the project?

Yes ☒ No ☐ N/A ☐ Comments:

e. Data quality or usability affected?

Data quality or usability are not affected.

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6. QC Samples

a. Method Blank

- i. One method blank reported per matrix, analysis and 20 samples?

Yes ☒ No ☐ N/A ☐ Comments:

- ii. All method blank results less than RL or project specified objectives?

Yes ☐ No ☒ N/A ☐ Comments:

Method blank for preparation batch 320-592017 contained PFOS above reporting limits. Associated samples were not re-extracted and/or re-analyzed because results were greater than 10x the value found in the Method Blank.

- iii. If above RL or project specified objectives, what samples are affected?

Comments:

The following samples are associated with the above-mentioned preparation batch: *FP-P7:0.5*, *FP-P7:7.0*, *FP-P100:0.5*, *FP-P8:1.5*, *FP-P101:1.5*, and *FP-MW1:7.6*.

- iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes ☐ No ☒ N/A ☐ Comments:

The reported results are greater than ten times the method blank detections and the detected results are not considered affected.

- v. Data quality or usability affected?

Comments:

Data is considered not affected; see above.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

- i. Organics – One LCS reported per matrix, analysis and 20 samples?

Yes ☒ No ☐ N/A ☐ Comments:

LCS samples were reported for PFAS preparation batches 320-591338, 320-592016, 320-592017, 320-592524, and 320-593335. We have no measure of laboratory precision for preparation batches 320-591338 and 320-592524. Refer to Section 6.c for assessment of laboratory precision for these the remaining preparation batches.

LCS/LCSD samples were reported for PFAS preparation batch 320-592403.

320-88345-1

Laboratory Report Date:

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- ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes ☐ No ☐ N/A ☒ Comments:

No metals/inorganics were submitted with this work order.

- iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes ☒ No ☐ N/A ☐ Comments:

- iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate.

Yes ☒ No ☐ N/A ☐ Comments:

- v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

N/A; see above.

- vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes ☐ No ☐ N/A ☒ Comments:

See above.

- vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality or usability are not affected.

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c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)**i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?**Yes ☐ No ☒ N/A ☐ Comments:

There was insufficient sample volume available to perform MS/MSD samples associated with preparation batch 320-592403. Refer to Section 6.b for assessment of laboratory accuracy and precision for this preparation batch.

MS/MSD samples were reported for preparation batches 320-592016, 320-592017, and 320-3335.

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?Yes ☐ No ☐ N/A ☒ Comments:

Metals/inorganics were not submitted with this work order.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?Yes ☐ No ☒ N/A ☐ Comments:

The MS and/or MSD associated with preparation batch 320-592017 had high recovery failures for perfluorohexanoic acid (PFHxA), perfluorooctanoic acid (PFOA), perfluorononanoic acid (PFNA), perfluorotridecanoic acid (PFTrDA), perfluorohexanesulfonic acid (PFHxS), 4,8-dioxa-3H-perfluorononanoic acid (DONA), perfluoroundecanoic acid (PFUnA), perfluorooctanesulfonic acid (PFOS), 9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS or F-35B major), and 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS or F-35B minor).

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.Yes ☒ No ☐ N/A ☐ Comments:**v. If %R or RPD is outside of acceptable limits, what samples are affected?**

Comments:

The parent sample *FP-P7:0.5* was used to perform the MS/MSD samples for preparation batch 320-592017. The project sample *FP-P7:0.5* and the field duplicate *FP-P100:0.5* are considered affected.

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Paine Field

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes ☒ No ☐ N/A ☐ Comments:

The analytes F-35B major (9Cl-PF3ONS), F-35B minor (11Cl-PF3OUdS), and DONA did not have detections in the parent samples. These analytes are not affected by the high MS/MSD recovery failures.

The analytes PFTrDA, PFHxS, PFUnA, and PFOS had initial concentrations greater than the spiking concentration. This may contribute a significant uncertainty to the recovery calculations; the MS recovery may not be representative of actual method performance for the matrix. These analytes are not affected by the high MS/MSD recovery failures.

The analytes PFHxA, PFOA, and PFNA are considered affected by the high MS/MSD recovery failures. The sample results are flagged "JH" in the analytical summary tables for samples *FP-P7:0.5* and *FP-P100:0.5*.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality is considered affected; see above.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes ☒ No ☐ N/A ☐ Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes ☐ No ☒ N/A ☐ Comments:

The IDA recovery for 18O2-PFHxS was outside control limits, biased high, in project sample *FP-P3:GW*.

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes ☒ No ☐ N/A ☐ Comments:

The PFHxS result for project sample *FP-P3:GW* is considered estimated and is flagged "J" in the analytical summary tables.

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Report Name:

Paine Field

iv. Data quality or usability affected?

Comments:

Data quality or usability are affected; see above.

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples?
(If not, enter explanation below.)

Yes ☐ No ☐ N/A ☐

Comments:

PFAS are not volatile compounds; therefore, a trip blank is not required.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC?

Yes ☐ No ☐ N/A ☒

Comments:

A trip blank is not required.

iii. All results less than RL and project specified objectives?

Yes ☐ No ☐ N/A ☒

Comments:

See above.

iv. If above RL or project specified objectives, what samples are affected?

Comments:

N/A; see above.

v. Data quality or usability affected?

Comments:

N/A; see above.

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples or required frequency for the project?

Yes ☒ No ☐ N/A ☐

Comments:

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ii. Submitted blind to lab?

Yes ☒ No ☐ N/A ☐ Comments:

Field duplicate sample pairs *FP-P7:0.5/FP-P100:0.5*, *FP-P8:1.5/FP-P101:1.5*, *FP-MW1:0.4/FP-MW100:0.4*, *FP-MW2:0.5/FP-MW101:0.5*, and *FP-MW3:0.5/FP-MW102:0.5*.

iii. Precision – All relative percent differences (RPD) less than specified project objectives?
(Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration
 R_2 = Field Duplicate Concentration

Yes ☐ No ☒ N/A ☐ Comments:

The following samples exceeded 50% for PFTeA: *FP-P7:0.5* and *FP-MW1:0.4*.

The following samples exceeded 50% for PFNA: *FP-P8:1.5* and *FP-MW3:0.5*.

The following samples exceeded 50% for PFOS: *FP-P8:1.5* and *FP-MW3:0.5*.

The following samples exceeded 50% for PFHxS: *FP-P8:1.5*.

The following samples exceeded 50% for PFTTrDA: *FP-MW1:0.4*.

The following samples exceeded 50% for PFHxA: *FP-MW3:0.5*.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

The primary and field duplicate samples with RPDs exceeding the DQOs are considered estimated due to the precision failures and are flagged “J” in the analytical summary tables.

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes ☐ No ☐ N/A ☒ Comments:

Previous data packets for this project have assessed the equipment blanks.

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Paine Field

i. All results less than RLs and project specified objectives?

Yes ☐ No ☐ N/A ☒ Comments:

See above.

ii. If above RL or project specified objectives, what samples are affected?

Comments:

N/A; see above.

iii. Data quality or usability affected?

Comments:

N/A: see above.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes ☒ No ☐ N/A ☐ Comments:

Refer to Section 4.b for applied qualifiers for the transition mass ratio failures.

Attachment F-2

Laboratory Data Review Checklist, Work Order 320-88632-1 (11 pages)

APPENDIX F: QUALITY ASSURANCE/QUALITY CONTROL OF ANALYTICAL DATA

Laboratory Data Review Checklist

Completed By:

Christopher Hall

Title:

Environmental Scientist

Date:

3/2/2023

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

Eurofins Environment Testing

Laboratory Report Number:

320-88632-1

Laboratory Report Date:

7/11/2022

Report Name:

Paine Field

Project Number

102986-008

320-88632-1

Laboratory Report Date:

7/11/2022

Report Name:

Paine Field

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

- a. Did a WA State Ecology approved laboratory receive and perform all of the submitted sample analyses?

Yes ☒ No ☐ N/A ☐ Comments:

The project samples were submitted to Eurofins Environmental Testing of West Sacramento, California. The laboratory is a WA State Department of Ecology approved laboratory for the requested analyses (Accreditation # C851-22).

- b. If the samples were transferred to another “network” laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses WA State Ecology approved?

Yes ☐ No ☐ N/A ☒ Comments:

Sample analyses were not subcontracted or transferred to another laboratory.

2. Chain of Custody (CoC)

- a. CoC information completed, signed, and dated (including released/received by)?

Yes ☒ No ☐ N/A ☐ Comments:

- b. Correct analyses requested?

Yes ☒ No ☐ N/A ☐ Comments:

Per- and polyfluoroalkyl substances (PFAS) by the Modified Method 537.1 – 18 analytes

3. Laboratory Sample Receipt Documentation

- a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

Yes ☒ No ☐ N/A ☐ Comments:

The temperature of the cooler was documented at 2.7° C.

- b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

Yes ☒ No ☐ N/A ☐ Comments:

PFAS does not require any additional preservation beyond temperature control.

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Paine Field

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes ☒ No ☐ N/A ☐ Comments:

The laboratory noted the samples arrived in good condition.

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes ☐ No ☐ N/A ☒ Comments:

The laboratory did not note any discrepancies.

e. Data quality or usability affected?

Comments:

Data quality or usability are not affected.

4. Case Narrative

a. Present and understandable?

Yes ☒ No ☐ N/A ☐ Comments:

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b. Discrepancies, errors, or QC failures identified by the lab?

Yes ☒ No ☐ N/A ☐ Comments:

Results for samples *FP-MW1:GW* (320-88632-4), *FP-MW2:GW* (320-88632-5), *FP-MW3:GW* (320-88632-6), *FP-MW4:GW* (320-88632-7), and *FP-MW100:GW* (320-88632-8) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits. Sample results are not affected.

The concentration of PFOS associated with samples *FP-MW1:GW* (320-88632-4), *FP-MW4:GW* (320-88632-7), and *FP-MW100:GW* (320-88632-8) exceeded the instrument calibration range at the maximum 100x dilution. These analytes have been qualified; however, the peak did not saturate the instrument detector. Historical data indicate that for the isotope dilution method, dilution and re-analysis will not produce significantly different results from those reported above the calibration range. Sample results are considered estimated, no direction of bias, and are flagged "J" in the analytical summary tables.

The "I" qualifier means the transition mass ratio for the indicated analyte was above the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty, and the reported value may have some high bias. However, analyst judgment was used to positively identify the analyte. The sample *FP-EB2* (320-88632-3) had a transition mass ratio failure for perfluorooctanesulfonic acid (PFOS). This sample is a field QC sample and does not require qualification.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-595252. The analyzed LCS and LCSD samples to assess laboratory accuracy and precision. Samples results are not affected.

The following samples in preparation batch 320-595252 were observed to have a thin layer of sediment present in the bottom of the bottle prior to extraction. *FP-MW1:GW* (320-88632-4), *FP-MW3:GW* (320-88632-6) and *FP-MW100:GW* (320-88632-8). Sample results are not affected.

c. Were all corrective actions documented?

Yes ☒ No ☐ N/A ☐ Comments:

See above.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

The case narrative does not note an effect on data quality or usability.

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5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes ☒ No ☐ N/A ☐ Comments:

b. All applicable holding times met?

Yes ☒ No ☐ N/A ☐ Comments:

c. All soils reported on a dry weight basis?

Yes ☒ No ☐ N/A ☐ Comments:

Sample *FP-MW4:105.0* is a soil sample and reported on a dry weight basis.

d. Are the RLs less than the Cleanup Level or the minimum required detection level for the project?

Yes ☒ No ☐ N/A ☐ Comments:

e. Data quality or usability affected?

The data quality/usability are not affected.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes ☒ No ☐ N/A ☐ Comments:

ii. All method blank results less than RL or project specified objectives?

Yes ☒ No ☐ N/A ☐ Comments:

However, PFOS was detected in the method blank associated with preparation batch 320-595252 at an estimated concentration below the RL.

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iii. If above RL or project specified objectives, what samples are affected?

Comments:

The project samples *FP-EB1*, *FP-EB2*, *FP-MW1:GW*, *FP-MW2:GW*, *FP-MW3:GW*, *FP-MW4:GW*, and *FP-MW100:GW* are associated with preparation batch 320-595252.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes ☒ No ☐ N/A ☐ Comments:

The project samples *FP-EB1* and *FP-EB2* had detections for PFOS at a concentration less than five times the method blank detection. The sample results are considered non-detect due to the potential laboratory cross-contamination. However, these samples are field QC samples and do not require qualification.

The project samples *FP-MW1:GW*, *FP-MW2:GW*, *FP-MW3:GW*, *FP-MW4:GW*, and *FP-MW100:GW* had detections for PFOS at concentrations greater than ten times the method blank detection. The PFOS results for these samples are not affected.

v. Data quality or usability affected?

Comments:

Data quality or usability are affected; see above.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS reported per matrix, analysis and 20 samples?

Yes ☒ No ☐ N/A ☐ Comments:

An LCS sample is reported for preparation batch 320-593643. Refer to Section 6.c for assessment of laboratory precision.

LCS/LCSD samples are reported for preparation batch 320-595252.

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes ☐ No ☐ N/A ☒ Comments:

No metals/inorganics were submitted with this workorder.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes ☒ No ☐ N/A ☐ Comments:

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- iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate.

Yes ☒ No ☐ N/A ☐ Comments:

- v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

None; method accuracy and precision were demonstrated to be within acceptable limits.

- vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes ☐ No ☐ N/A ☒ Comments:

Qualification was not required; see above.

- vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality/usability are not affected.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

- i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes ☒ No ☐ N/A ☐ Comments:

MS/MSD samples were reported for preparation batch 320-593643.

- ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes ☐ No ☐ N/A ☒ Comments:

No Metals/Inorganics analysis were performed in this work order.

- iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes ☒ No ☐ N/A ☐ Comments:

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7/11/2022

Report Name:

Paine Field

- iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes ☒ No ☐ N/A ☐ Comments:

- v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

None; method accuracy and precision were demonstrated to be within acceptable limits.

- vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes ☐ No ☐ N/A ☒ Comments:

Qualification was not required; see above.

- vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality/usability are not affected.

- d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

- i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes ☒ No ☐ N/A ☐ Comments:

- ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes ☒ No ☐ N/A ☐ Comments:

- iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes ☐ No ☐ N/A ☒ Comments:

IDA recoveries were within acceptance criteria.

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iv. Data quality or usability affected?

Comments:

Data quality or usability are not affected.

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples?
(If not, enter explanation below.)

Yes ☐ No ☐ N/A ☒

Comments:

PFAS are not volatile compounds; therefore, a trip blank is not required.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC?

Yes ☐ No ☐ N/A ☒

Comments:

A trip blank is not required.

iii. All results less than RL and project specified objectives?

Yes ☐ No ☐ N/A ☒

Comments:

See above.

iv. If above RL or project specified objectives, what samples are affected?

Comments:

N/A; see above.

v. Data quality or usability affected?

Comments:

Data quality or usability are not affected.

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis, and 10 project samples or required frequency for the project?

Yes ☒ No ☐ N/A ☐

Comments:

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Report Name:

Paine Field

ii. Submitted blind to lab?

Yes ☒ No ☐ N/A ☐ Comments:

Field duplicate sample pairs *FP-MW1:GW/FP-MW100:GW*.

iii. Precision – All relative percent differences (RPD) less than specified project objectives?
(Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration
 R_2 = Field Duplicate Concentration

Yes ☒ No ☐ N/A ☐ Comments:

RPD are within project DQOs, where calculable.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

Data quality or usability are not affected.

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes ☒ No ☐ N/A ☐ Comments:

i. All results less than RLs and project specified objectives?

Yes ☐ No ☒ N/A ☐ Comments:

PFOS was detected in the equipment blank *FP-EB2* above the RL. PFHxA and PFHpA were detected below the RL in the equipment blank *FP-EB2*.

PFOS was detected in the equipment blank *FP-EB1* below the RL.

ii. If above RL or project specified objectives, what samples are affected?

Comments:

Equipment blank *FP-EB1* is associated with samples *FP-MW1:GW*, *FP-MW100:GW*, and *FP-MW4:GW*. Equipment blank *FP-EB2* is associated with samples *FP-MW2:GW* and *FP-MW3:GW*. However, the project samples had detections for these analytes greater than ten times the equipment blank detections. Sample results are not affected.

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Laboratory Report Date:

7/11/2022

Report Name:

Paine Field

iii. Data quality or usability affected?

Comments:

Data quality and usability are not affected; see above.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes ☒ No ☐ N/A ☐

Comments:

Refer to Section 4.b for applied qualifiers due to transition mass ratio failures and calibration exceedances.

Attachment F-3

Laboratory Data Review Checklist, Work Order 320-94720-1 (11 pages)

APPENDIX F: QUALITY ASSURANCE/QUALITY CONTROL OF ANALYTICAL DATA

Laboratory Data Review Checklist

Completed By:

Christopher Hall

Title:

Environmental Scientist

Date:

3/16/2023

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

Eurofins Environment Testing

Laboratory Report Number:

320-94720-1

Laboratory Report Date:

12/21/2022

Report Name:

Paine Field

Project Number

102986-008

320-94720-1

Laboratory Report Date:

12/21/2022

Report Name:

Paine Field

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

- a. Did a WA State Ecology approved laboratory receive and perform all of the submitted sample analyses?

Yes ☒ No ☐ N/A ☐ Comments:

The project samples were submitted to Eurofins Environmental Testing of West Sacramento, California. The laboratory is a WA State Department of Ecology approved laboratory for the requested analyses (Accreditation # C851-22).

- b. If the samples were transferred to another “network” laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses WA State Ecology approved?

Yes ☐ No ☐ N/A ☒ Comments:

Sample analyses were not subcontracted or transferred to another laboratory.

2. Chain of Custody (CoC)

- a. CoC information completed, signed, and dated (including released/received by)?

Yes ☒ No ☐ N/A ☐ Comments:

- b. Correct analyses requested?

Yes ☒ No ☐ N/A ☐ Comments:

Per- and polyfluoroalkyl substances (PFAS) by the Modified Method 537.1 – 18 analytes

3. Laboratory Sample Receipt Documentation

- a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

Yes ☒ No ☐ N/A ☐ Comments:

The temperature of the cooler was documented at 4.7°C.

- b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

Yes ☒ No ☐ N/A ☐ Comments:

PFAS does not require any additional preservation beyond temperature control.

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Laboratory Report Date:

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Report Name:

Paine Field

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes ☒ No ☐ N/A ☐ Comments:

The laboratory noted the samples arrived in good condition.

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes ☒ No ☐ N/A ☒ Comments:

e. Data quality or usability affected?

Comments:

Data quality or usability are not affected.

4. Case Narrative

a. Present and understandable?

Yes ☒ No ☐ N/A ☐ Comments:

b. Discrepancies, errors, or QC failures identified by the lab?

Yes ☒ No ☐ N/A ☐ Comments:

The Isotope Dilution Analyte (IDA) recovery associated with sample *FP-MW3-11232022* (320-94720-6) is below the method recommended limit. Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples. Refer to Section 6.d for further assessment.

Results for samples *FP-MW4-11212022* (320-94720-2), *FP-MW100-11212022* (320-94720-3), *FP-MW3-11232022* (320-94720-6), and *FP-MW2-11232022* (320-94720-8) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits. Sample results are not affected.

320-94720-1

Laboratory Report Date:

12/21/2022

Report Name:

Paine Field

The concentration of PFOS associated with sample *FP-MW3-11232022* (320-94720-6) exceeded the instrument calibration range. These analytes have been qualified; however, the peak(s) did not saturate the instrument detector. Historical data indicate that for the isotope dilution method, dilution and re-analysis will not produce significantly different results from those reported. The sample results are considered estimated, no direction of bias, and is flagged "J" in the analytical summary table.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 320-636892. Refer to Section 6.b for assessment of laboratory accuracy and precision for this preparation batch.

The samples *FP-MW4-11212022* (320-94720-2), *FP-MW100-11212022* (320-94720-3), *FP-MW3-11232022* (320-94720-6), and *FP-MW2-11232022* (320-94720-8) were light yellow prior to extraction.

The sample *FP-MW2-11232022* (320-94720-8) contained floating particulates in the sample bottle prior to extraction.

The sample *FP-MW3-11232022* (320-94720-6) contained a thin layer of sediment at the bottom of the bottle prior to extraction.

During the solid phase extraction process, the samples *FP-MW4-11212022* (320-94720-2), *FP-MW100-11212022* (320-94720-3), *FP-MW3-11232022* (320-94720-6) and *FP-MW2-11232022* (320-94720-8) contained non-settable particulates which clogged the solid phase extraction column.

c. Were all corrective actions documented?

Yes ☒ No ☐ N/A ☐ Comments:

LCS and LCSD samples were reported for preparation batch 320-638692 to assess laboratory accuracy and precision.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

The job narrative does not note an effect on data quality or usability. See the following sections for our assessment.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes ☒ No ☐ N/A ☐ Comments:

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b. All applicable holding times met?

Yes ☒ No ☐ N/A ☐ Comments:

c. All soils reported on a dry weight basis?

Yes ☒ No ☐ N/A ☐ Comments:

d. Are the RLs less than the Cleanup Level or the minimum required detection level for the project?

Yes ☒ No ☐ N/A ☐ Comments:

e. Data quality or usability affected?

The data quality/usability are not affected.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes ☒ No ☐ N/A ☐ Comments:

ii. All method blank results less than RL or project specified objectives?

Yes ☒ No ☐ N/A ☐ Comments:

iii. If above RL or project specified objectives, what samples are affected?

Comments:

N/A; target analytes were not observed in the method blank samples.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes ☐ No ☐ N/A ☒ Comments:

See above.

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v. Data quality or usability affected?

Comments:

Data quality or usability are not affected.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS reported per matrix, analysis and 20 samples?

Yes ☐ No ☒ N/A ☐

Comments:

LCS/LCSD samples were reported for preparation batch 320-636892.

An LCS sample was reported for preparation batch 320-637659. We have no measure of laboratory precision for this batch.

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes ☐ No ☐ N/A ☒

Comments:

No Metals/Inorganics were submitted with this work order.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes ☒ No ☐ N/A ☐

Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate.

Yes ☒ No ☐ N/A ☐

Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

None; method accuracy was demonstrated to be within acceptable limits.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes ☐ No ☐ N/A ☒

Comments:

Qualification was not required; see above.

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vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality/usability are not affected.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes ☐ No ☐ N/A ☒

Comments:

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate.

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes ☐ No ☐ N/A ☒

Comments:

See above.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes ☐ No ☐ N/A ☒

Comments:

See above.

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes ☐ No ☐ N/A ☒

Comments:

See above.

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

See above.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes ☐ No ☐ N/A ☒

Comments:

See above.

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vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

N/A; See above.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes ☒ No ☐ N/A ☐ Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes ☐ No ☒ N/A ☐ Comments:Sample *FP-MW3-11232022* has an IDA recovery failure for 13C4 PFOS.

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes ☐ No ☒ N/A ☐ Comments:

The associated analyte PFOS was re-analyzed at a dilution due to high concentrations of PFOS in the initial extract. The IDA recovery was within acceptance limits for the re-analyzed sample and the re-analyzed results are used for reporting purposes. The reported results are not affected by the IDA recovery failure in the undiluted analysis.

iv. Data quality or usability affected?

Comments:

Data quality or usability are not affected; see above.

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes ☐ No ☐ N/A ☒ Comments:

PFAS are not volatile compounds; therefore a trip blank is not required.

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ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC?

Yes ☐ No ☐ N/A ☐ Comments:

A trip blank is not required.

iii. All results less than RL and project specified objectives?

Yes ☐ No ☐ N/A ☒ Comments:

See above.

iv. If above RL or project specified objectives, what samples are affected?

Comments:

N/A; see above.

v. Data quality or usability affected?

Comments:

Data quality or usability are not affected.

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples or required frequency for the project?

Yes ☒ No ☐ N/A ☐ Comments:

ii. Submitted blind to lab?

Yes ☒ No ☐ N/A ☐ Comments:

Field duplicate sample pairs *FP-MW4-11212022/FP-MW100-11212022* was submitted with this work order.

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- iii. Precision – All relative percent differences (RPD) less than specified project objectives?
(Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration
 R_2 = Field Duplicate Concentration

Yes ☐ No ☒ N/A ☐ Comments:

The field-duplicate RPDs are within the recommended DQOs with the exception of PFHxS. The results are considered estimated and are flagged “J” to identify the imprecision.

- iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

Data quality is affected; however, data is still considered usable.

- g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes ☒ No ☐ N/A ☐ Comments:

- i. All results less than RLs and project specified objectives?

Yes ☒ No ☐ N/A ☐ Comments:

No Detections were found in the equipment blanks for this work order.

- ii. If above RL or project specified objectives, what samples are affected?

Comments:

See above.

- iii. Data quality or usability affected?

Comments:

Data quality or usability are not affected.

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7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes ☒ No ☐ N/A ☐

Comments:

Refer to Section 4.b for assessment of applied qualifiers due to calibration range exceedance.

Attachment F-4

Laboratory Data Review Checklist, Work Order 320-95325-1 (11 pages)

APPENDIX F: QUALITY ASSURANCE/QUALITY CONTROL OF ANALYTICAL DATA

Laboratory Data Review Checklist

Completed By:

Christopher Hall

Title:

Environmental Scientist

Date:

3/15/2023

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

Eurofins Environment Testing

Laboratory Report Number:

320-95325-1

Laboratory Report Date:

1/17/2023

Report Name:

Paine Field

Project Number

102986-008

320-95325-1

Laboratory Report Date:

1/17/2023

Report Name:

Paine Field

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

- a. Did a WA State Ecology approved laboratory receive and perform all of the submitted sample analyses?

Yes ☒ No ☐ N/A ☐ Comments:

The project samples were submitted to Eurofins Environmental Testing of West Sacramento, California. The laboratory is a WA State Department of Ecology approved laboratory for the requested analyses (Accreditation # C851-22).

- b. If the samples were transferred to another “network” laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses WA State Ecology approved?

Yes ☐ No ☐ N/A ☒ Comments:

Sample analysis were not subcontracted or transferred to another laboratory.

2. Chain of Custody (CoC)

- a. CoC information completed, signed, and dated (including released/received by)?

Yes ☒ No ☐ N/A ☐ Comments:

- b. Correct analyses requested?

Yes ☒ No ☐ N/A ☐ Comments:

Per- and polyfluoroalkyl substances (PFAS) by the Modified Method 537.1 – 18 analytes

3. Laboratory Sample Receipt Documentation

- a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

Yes ☒ No ☐ N/A ☐ Comments:

The temperature of the cooler was documented at 3.6° C

- b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

Yes ☒ No ☐ N/A ☐ Comments:

PFAS does not require any additional preservation beyond temperature control.

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c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes ☒ No ☐ N/A ☐ Comments:

The laboratory noted the samples arrived in good condition

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes ☐ No ☐ N/A ☒ Comments:

The laboratory did not note any discrepancies.

e. Data quality or usability affected?

Comments:

Data quality or usability are not affected.

4. Case Narrative

a. Present and understandable?

Yes ☒ No ☐ N/A ☐ Comments:

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b. Discrepancies, errors, or QC failures identified by the lab?

Yes ☒ No ☐ N/A ☐ Comments:

The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: *FP-MW1-12142022* (320-95325-1). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples. Refer to Section 6.d for further assessment.

The results for sample *FP-MW1-12142022* (320-95325-1) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits.

The concentration of perfluorooctanesulfonic acid (PFOS) for sample *FP-MW1-12142022* (320-95325-1) exceeded the instrument calibration range. This analyte has been qualified; however, the peak did not saturate the instrument detector. Historical data indicate that for the isotope dilution method, dilution and re-analysis will not produce significantly different results from those reported above the calibration range. The sample was run at the maximum dilution allowed for the method. The sample result is flagged "J" to identify the uncertainty in the result.

During the solid phase extraction process, the following samples contained non-settable particulates which clogged the solid phase extraction column: *FP-MW1-12142022* (320-95325-1). In addition, this sample was yellow in color prior to extraction.

c. Were all corrective actions documented?

Yes ☒ No ☐ N/A ☐ Comments:

d. What is the effect on data quality/usability according to the case narrative?

Comments:

The laboratory did not identify any effect on the data quality and usability. Refer to subsequent sections for further assessment.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes ☒ No ☐ N/A ☐ Comments:

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b. All applicable holding times met?

Yes ☒ No ☐ N/A ☐ Comments:

c. All soils reported on a dry weight basis?

Yes ☐ No ☐ N/A ☒ Comments:

Soils not submitted with this work order.

d. Are the RLs less than the Cleanup Level or the minimum required detection level for the project?

Yes ☒ No ☐ N/A ☐ Comments:

e. Data quality or usability affected?

Data quality or usability are not affected.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes ☒ No ☐ N/A ☐ Comments:

ii. All method blank results less than RL or project specified objectives?

Yes ☒ No ☐ N/A ☐ Comments:

iii. If above RL or project specified objectives, what samples are affected?

Comments:

N/A; see above.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes ☐ No ☐ N/A ☒ Comments:

See above.

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v. Data quality or usability affected?

Comments:

Data quality or usability are not affected.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS reported per matrix, analysis and 20 samples?

Yes ☒ No ☐ N/A ☐ Comments:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes ☐ No ☐ N/A ☒ Comments:

No Metals/Inorganics were submitted with this work order.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes ☒ No ☐ N/A ☐ Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate.

Yes ☒ No ☐ N/A ☐ Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

None; method accuracy was demonstrated to be within acceptable limits.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes ☐ No ☐ N/A ☐ Comments:

Qualification was no required; see above.

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vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality/usability is not affected.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes ☐ No ☐ N/A ☒

Comments:

Matrix spikes were not performed. Precision can be assessed with the LCS/LCSD

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes ☐ No ☐ N/A ☒

Comments:

See above.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes ☐ No ☐ N/A ☒

Comments:

See above.

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes ☐ No ☐ N/A ☒

Comments:

See above.

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

See above.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes ☐ No ☐ N/A ☒

Comments:

See above.

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vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

N/A; see above.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes ☒ No ☐ N/A ☐ Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes ☐ No ☒ N/A ☐ Comments:

Project sample *FP-MWI-12142022* had IDA recovery failures for 13C5 PFNA and 13C4 PFOS. The associated analytes for this sample were reanalyzed at a dilution due to high concentrations of the target analytes. The IDA recoveries in the diluted sample were within acceptance criteria and the reported results are not affected by the QC failure.

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes ☐ No ☐ N/A ☒ Comments:

See above.

iv. Data quality or usability affected?

Comments:

Data quality and usability are not affected. See above.

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes ☐ No ☐ N/A ☒ Comments:

PFAS are not volatile compounds; therefore, a trip blank is not required.

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ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC?

Yes ☐ No ☐ N/A ☒ Comments:

A trip blank is not required.

iii. All results less than RL and project specified objectives?

Yes ☐ No ☐ N/A ☒ Comments:

See above.

iv. If above RL or project specified objectives, what samples are affected?

Comments:

N/A; see above.

v. Data quality or usability affected?

Comments:

Data quality or usability are not affected.

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples or required frequency for the project?

Yes ☒ No ☐ N/A ☐ Comments:

A field duplicate was not submitted with this work order, however, the project has submitted the necessary ratio of 1 duplicate per 10 project samples.

ii. Submitted blind to lab?

Yes ☐ No ☐ N/A ☒ Comments:

See above.

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iii. Precision – All relative percent differences (RPD) less than specified project objectives?
(Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration
 R_2 = Field Duplicate Concentration

Yes ☐ No ☐ N/A ☒ Comments:

See above.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

N/A; See above.

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes ☐ No ☐ N/A ☐ Comments:

An equipment blank was not submitted with this work order, however, the project has submitted the necessary equipment blanks.

i. All results less than RLs and project specified objectives?

Yes ☐ No ☐ N/A ☒ Comments:

See above.

ii. If above RL or project specified objectives, what samples are affected?

Comments:

N/A; see above.

iii. Data quality or usability affected?

Comments:

N/A; see above.

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7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes ☒ No ☐ N/A ☐

Comments:

Refer to Section 4.b for applied qualifiers due to calibration exceedances.

Important Information

About Your Environmental Site Assessment/Evaluation Report

ENVIRONMENTAL SITE ASSESSMENTS/EVALUATIONS ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

This report was prepared to meet the needs you specified with respect to your specific site and your risk management preferences. Unless indicated otherwise, we prepared your report expressly for you and for the purposes you indicated. No one other than you should use this report for any purpose without first conferring with us. No one is authorized to use this report for any purpose other than that originally contemplated without our prior written consent.

The findings and conclusions documented in this site assessment/evaluation have been prepared for specific application to this project and have been developed in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in this area. The conclusions presented are based on interpretation of information currently available to us and are made within the operational scope, budget, and schedule constraints of this project. No warranty, express or implied, is made.

OUR REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

Our environmental site assessment is based on several factors and may include (but not be limited to) reviewing public documents to chronicle site ownership for the past 30, 40, or more years; investigating the site's regulatory history to learn about permits granted or citations issued; determining prior uses of the site and those adjacent to it; reviewing available topographic and real estate maps, historical aerial photos, geologic information, and hydrologic data; reviewing readily available published information about surface and subsurface conditions; reviewing federal and state lists of known and potentially contaminated sites; evaluating the potential for naturally occurring hazards; and interviewing public officials, owners/operators, and/or adjacent owners with respect to local concerns and environmental conditions.

Except as noted within the text of the report, no sampling or quantitative laboratory testing was performed by us as part of this site assessment. Where such analyses were conducted by an outside laboratory, Shannon & Wilson relied upon the data provided and did not conduct an independent evaluation regarding the reliability of the data.

CONDITIONS CAN CHANGE.

Site conditions, both surface and subsurface, may be affected as a result of natural processes or human influence. An environmental site assessment/evaluation is based on conditions that existed at the time of the evaluation. Because so many aspects of a historical review rely on third-party information, most consultants will refuse to certify (warrant) that a site is free of contaminants, as it is impossible to know with absolute certainty if such a condition exists. Contaminants may be present in areas that were not surveyed or sampled or may migrate to areas that showed no signs of contamination at the time they were studied.

Unless your consultant indicates otherwise, your report should not be construed to represent geotechnical subsurface conditions at or adjacent to the site and does not provide sufficient information for construction-related activities. Your report also should not be used following floods, earthquakes, or other acts of nature; if the size or configuration of the site is altered; if the location of the site is modified; or if there is a change of ownership and/or use of the property.

INCIDENTAL DAMAGE MAY OCCUR DURING SAMPLING ACTIVITIES.

Incidental damage to a facility may occur during sampling activities. Asbestos and lead-based paint sampling often require destructive sampling of pipe insulation, floor tile, walls, doors, ceiling tile, roofing, and other building materials. Shannon & Wilson does not provide for paint repair. Limited repair of asbestos sample locations is provided. However, Shannon & Wilson neither warrants repairs made by our field personnel, nor are we held liable for injuries or damages as a result of those repairs. If you desire a specific form of repair, such as those provided by a licensed roofing contractor, you need to request the specific repair at the time of the proposal. The owner is responsible for repair methods that are not specified in the proposal.

READ RESPONSIBILITY CLAUSES CAREFULLY.

Environmental site assessments/evaluations are less exact than other design disciplines because they are based extensively on judgment and opinion and there may not have been any (or very limited) investigation of actual subsurface conditions. Wholly unwarranted claims have been lodged against consultants. To limit this exposure, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses may appear in this report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

Consultants cannot accept responsibility for problems that may develop if they are not consulted after factors considered in their reports have changed or conditions at the site have changed. Therefore, it is incumbent upon you to notify your consultant of any factors that may have changed prior to submission of the final assessment/evaluation.

An assessment/evaluation of a site helps reduce your risk but does not eliminate it. Even the most rigorous professional assessment may fail to identify all existing conditions.

ONE OF THE OBLIGATIONS OF YOUR CONSULTANT IS TO PROTECT THE SAFETY, HEALTH, PROPERTY, AND WELFARE OF THE PUBLIC.

If our environmental site assessment/evaluation discloses the existence of conditions that may endanger the safety, health, property, or welfare of the public, we may be obligated under rules of professional conduct, statutory law, or common law to notify you and others of these conditions.

The preceding paragraphs are based on information provided by the Geoprofessional Business Association (<https://www.geoprofessional.org>)