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REPORT

Nome Airport Initial PFAS Site Characterization

NOME, ALASKA

April 2021

Shannon & Wilson No: 105745-002 / 003

SHANNON & WILSON

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Submitted To: Alaska Department of Transportation & Public Facilities, Northern Region
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Attn: Dan Phillips and Sammy Cummings

Subject: REPORT, NOME AIRPORT INITIAL PFAS SITE CHARACTERIZATION, NOME, ALASKA

Shannon & Wilson prepared this report to document initial per- and polyfluoroalkyl substances (PFAS) site characterization activities at the Nome Airport (OME).

This report was prepared on behalf of the Alaska Department of Transportation & Public Facilities (DOT&PF) in accordance with the terms and conditions of Shannon & Wilson's proposal dated September 2, 2020. The site characterization effort was authorized on October 16, 2020 by NTPs 10-2 and 10-3 under Professional Services Agreement Number 25-19-013 Per- and Polyfluoroalkyl Substances (PFAS) Related Environmental & Engineering Services.

This document has been revised in response to DOT&PF comments and supersedes the draft report dated February 1, 2021. 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.

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ACRONYMS

AAC	Alaska Administrative Code
Addendum	Generic Work Plan Addendum 003-OMW-001
AFFF	aqueous film forming foam
ARFF	Aircraft Rescue and Firefighting
ARNG	Alaska Army Air National Guard
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
°C	degrees Celsius
CSM	conceptual site model
CSPP	Construction Safety and Phasing Plan
DEC	Alaska Department of Environmental Conservation
DO	dissolved oxygen
DOT&PF	Alaska Department of Transportation & Public Facilities
DRO	diesel range organics
FAA	Federal Aviation Administration
ft.	feet
GAC	granular activated carbon
GeoTek	GeoTek Alaska, Inc.
GRO	gasoline range organics
GWP	Statewide PFAS General Work Plan Revision 1
LDRC	Laboratory Data Review Checklist
LOQ	limit of quantitation
MB	method blank
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MTG	migration to groundwater
MW	monitoring well
mV	millivolt
ng/L	nanograms per liter
OME	Nome Airport
PAH	polynuclear aromatic hydrocarbons
PFAS	per- and polyfluoroalkyl substances
PFBS	perfluorobutanesulfonic acid
PFDA	perflourodecanonic acid
PFHpA	perfluoroheptanoic acid
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexanesulfonic acid

PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PID	photoionization detector
ppm	parts per million
QA	quality assurance
QC	quality control
RL	reporting limit
RRO	residual range organics
SGS	SGS North America, Inc.
TestAmerica	Eurofins TestAmerica Laboratories, Sacramento
TWP	temporary well point
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
µS	microSiemens
YSI	multiprobe water quality meter

1 INTRODUCTION

This report documents initial per- and polyfluoroalkyl substances (PFAS) site characterization activities at and near the Nome Airport (OME) conducted in fall and winter 2020. To Shannon & Wilson's knowledge, no PFAS analytical testing has been conducted at the OME prior to this field effort. The OME is an active Alaska Department of Environmental Conservation (DEC) contaminated site due to the use of PFAS-containing aqueous film forming foam (AFFF) at several locations on OME property (File Number 400.38.056, Hazard ID 27154). The geographic coordinates of the center of the two OME runways are latitude 64.5106, longitude -165.4446.

Shannon & Wilson has prepared this report on behalf of the Alaska Department of Transportation & Public Facilities (DOT&PF) Northern Region. The field effort described herein was conducted in general accordance with *DOT&PF Statewide PFAS General Work Plan Revision 1* (GWP), submitted to DEC July 2020; *GWP Addendum 003-OME-01* (Addendum), dated August 26, 2020; and relevant regulatory guidance documents. The Addendum was approved by DEC on September 21, 2020.

Exhibit 1-1: MW development at OME-MW01-15

1.1 Purpose and Objectives

The purpose of the services described in this report was to evaluate the extent of PFAS contamination, if present, resulting from the historic use of AFFF by the DOT&PF at the OME.

The initial site characterization effort included:

- conducting a limited water supply well search to confirm municipal water is the source of drinking water near and downgradient of the OME;
- sampling identified water supply wells for PFAS;

- collecting analytical surface and subsurface soil samples from near the OME runways and potential AFFF releases areas;
- installing and sampling temporary well points (TWPs) to evaluate PFAS concentrations just below the surface of groundwater;
- constructing, developing, and sampling monitoring wells (MWs) at two locations near AFFF release areas; and
- collecting analytical surface water and sediment samples from OME drainage ditches, ponds, and creeks.

1.2 Background

The OME is located at 227 Airport Road in Nome, Alaska. The airport is northwest of downtown Nome and north of Norton Sound. Runway 10-28 is the primary OME runway, while Runway 3-21 is designed for use in a crosswind. Figure 1 shows the property boundaries for land owned by the DOT&PF.

Exhibit 1-2: TWP installation at the former ARFF building

The OME and many adjacent parcels are owned by the DOT&PF. Part 139 Airports are required to conduct annual AFFF systems testing to maintain their certification through the Federal Aviation Administration (FAA). DOT&PF Aircraft Rescue and Firefighting (ARFF) services used AFFF for training and systems testing for many years. Prior to 2019, FAA inspections required the release of AFFF to the ground surface. To our knowledge there are no known emergency response incidents where AFFF was used in Nome.

Areas of known AFFF use are shown in Figure 1. DOT&PF ARFF training activities at OME began in the 1970s. Training likely occurred twice per year near the current ARFF building, and at least once per year at various locations along the OME runways. The current ARFF building was constructed between 2006 and 2008. Before then, the ARFF building was located on the Southeast Apron. The former ARFF building was constructed between 1971 and 1984. The precise timeline and locations of AFFF use are unknown. Locations of minor spraying are not shown in Figure 1.

Specific potential sources of AFFF use are:

- AFFF systems testing and training north of the current ARFF building;
- systems testing and training southwest of the junction or Runways 10-28 and 3-21;
- ARFF truck transfer and cleaning at the current ARFF building;
- transfer and cleaning at the former ARFF building prior to 2008;
- FAA required AFFF systems testing areas at other locations along the OME runways;
- AFFF storage areas including the ARFF building and Alaska Army Air National Guard (ARNG) hangar.

DOT&PF leases several lots to businesses and other entities for use as terminals, hangars, and transportation facilities. The ARNG has leased an approximately 1-acre plot from the DOT&PF since 1988 (Figure 1). According to an October 2019 report prepared by the ARNG, AFFF is stored at their facility but the "evidence does not support current or former ARNG activities as having contributed to PFAS contamination" at the OME (AECOM, 2019). Their 2019 assessment did not include analytical sampling. The other OME lease lots are located on the Main Terminal Apron on the south side of the OME (Figure 1). The site reconnaissance did not identify additional PFAS source areas related to activities conducted by OME tenants.

1.3 Geology and Hydrology

The OME is located on the Norton Sound coastal plain and is surrounded by seasonally saturated wetlands. Poorly drained organic-rich silty loam and/or peat deposits may be present in undisturbed areas. The Snake River and several small streams flow through OME property.

Areas of the Snake River floodplain south and east of the OME have been mined for placer gold. The subsurface consists of unconsolidated colluvial, glacial outwash and till, and beach deposits with variable-depth permafrost. Unconsolidated silts, sands, and gravels are underlain by weathered schist bedrock at a depth of approximately 25 to 60 feet (ft.) below ground surface (bgs) (Dorava, 1995; Sainsbury, 1975; AECOM, 2019; Shannon & Wilson, 2010). Drilling for this site

Exhibit 1-3: Schist bedrock encountered in soil boring ARFF-SB3.

characterization effort encountered bedrock at 27 ft. south of the ARFF building, and permafrost at 15 ft. near Taxiway Hotel.

Depth to groundwater near the OME fluctuates based on the season, tides, and precipitation. Previous investigations have encountered groundwater between five and 29 ft. bgs. DOT&PF staff in Nome report groundwater can be present as shallow as 3 ft. bgs in low-lying areas. Drilling for this effort encountered groundwater between 5.5 and 13 ft. bgs. In unfrozen areas near the OME, groundwater may be hydrologically connected to Norton Sound causing salt-water intrusion (Dorava, 1995; Shannon & Wilson, 2010).

The Nome Joint Utility System supplies the downtown Nome area and OME vicinity (DEC Public Water System ID No. 2340010). The water system has approximately 1,250 service connections and provides water to over 3,000 individuals. The utility sources their water from several groundwater wells several miles north from downtown Nome, at the base of Anvil Mountain (Dorava, 1995; Nome Joint Utility System, 2017).

1.4 Contaminants of Concern and Regulatory Limits

The primary contaminants of concern are PFAS compounds perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA). The DEC migration-to-groundwater (MTG) soil cleanup levels for PFOS and PFOA are 3.0 micrograms per kilogram (µg/kg) and 1.7 µg/kg, respectively. The DEC groundwater cleanup level for PFOS or PFOA is 400 nanograms per liter (ng/L). The soil and groundwater cleanup levels were promulgated in 18 Alaska Administrative Code (AAC) 75.345 in 2016. There are no cleanup levels for other PFAS compounds.

The current DEC action level for drinking water is the U.S. Environmental Protection Agency's lifetime health advisory level of 70 ng/L for the sum of PFOS and PFOA. This action level was published in an April 2019 update to DEC's *Technical Memorandum: Action Levels for PFAS in Water and Guidance on Sampling Groundwater and Drinking Water*. This report references the DEC groundwater cleanup level because groundwater is not a known drinking water source (see Section 4.2).

The secondary contaminant of concern is diesel range organics (DRO). It is possible metals or other contaminants related to historic mining activity may be present on OME property; however, analysis of these contaminates is outside the scope of the GWP Addendum.

DEC's *Field Sampling Guidance* (2019) also identifies gasoline range organics (GRO), residual range organics (RRO), benzene, toluene, ethylbenzene, and xylenes (BTEX), and polynuclear aromatic hydrocarbons (PAHs) as contaminants of potential concern at ARFF training areas. Applicable regulatory limits are summarized below in Exhibit 1-4.

Exhibit 1-4: Regulatory Limits and Action Levels

Method	Analyte	Soil Limit [a] (mg/kg)	Regulatory Water Limit [b] (µg/L)
537.1 or 537.1M	PFOS	0.0030	0.40
	PFOA	0.0017	0.40
	PFOS + PFOA [c]	-	0.070
AK101	GRO	300	2,200
AK102	DRO	250	1,500
AK103	RRO	11,000	1,100
EPA 8260 (BTEX)	Benzene	0.022	4.6
	Toluene	6.7	1,100
	Ethylbenzene	0.13	15
	Xylenes Total	1.5	190
EPA 8270D-SIM (PAH)	1-Methylnaphthalene	0.41	11
	2-Methylnaphthalene	1.3	36
	Acenaphthene	37	530
	Acenaphthylene	18	260
	Anthracene	390	43
	Benzo(a)anthracene	0.70	0.30
	Benzo[a]pyrene	1.9	0.25
	Benzo[b]fluoranthene	20	2.5
	Benzo[g,h,i]perylene	15,000	0.26
	Benzo[k]fluoranthene	190	0.80
	Chrysene	600	2.0
	Dibenzo[a,h]anthracene	6.3	0.25
	Fluoranthene	590	260
	Fluorene	36	290
	Indeno [1,2,3-c,d] pyrene	65	0.19
	Naphthalene	0.38	1.7
	Phenanthrene	39	170
	Pyrene	87	120

Notes:

a. 18 AAC 75 Table B2. Method Two - Petroleum Hydrocarbon Soil Cleanup Levels - Under 40-Inch Zone - Migration to Groundwater or Table B1. Method Two - Soil Cleanup Levels Table - Migration to Groundwater.

b. 18 AAC 75 Table C. Groundwater Cleanup Levels.

c. Action level reported in DEC's April 2019 Technical Memorandum. Equivalent to the U.S. Environmental Protection Agency's lifetime health advisory level for drinking water.

mg/kg = milligrams per kilogram, µg/L = micrograms per liter, PFOS = perfluorooctanesulfonic acid, PFOA = perfluorooctanoic acid, GRO = gasoline range organics, DRO = diesel range organics, RRO = residual range organics, BTEX = benzene, toluene, ethylbenzene, and total xylenes, PAH = polynuclear aromatic hydrocarbons

1.5 Scope of Services

The scope of services summarized in this report includes a limited water supply well search; site access and permitting; targeted soil field screening; analytical soil, groundwater, surface water, and sediment sampling; data analysis; and preparing this summary report. Soil sampling included collection of surface soil and subsurface soil from borings. Groundwater sampling included collection of water samples from water supply wells, TWPs, and long-term MWs. Figure 2 depicts the well search areas and water supply well sample locations. Figure 3 is an overview of the initial site characterization sample locations.

This report was prepared for the exclusive use of the DOT&PF and its representatives. This work presents Shannon & Wilson's professional judgment as to the conditions of the site. Information presented here is based on the sampling and analyses field staff performed. This report should not be used for other purposes without Shannon & Wilson's approval or if any of the following occurs:

- Project details change, or new information becomes available, such as revised regulatory levels or the discovery of additional source areas.
- Conditions change due to natural forces or human activity at, under, or adjacent to the project site.
- Assumptions stated in this report have changed.
- If the site ownership or land use has changed.
- Regulations, laws, or cleanup levels change.
- If the site's regulatory status has changed.

If any of these occur, Shannon & Wilson should be retained to review the applicability of recommendations. This report should not be used for other purposes without Shannon & Wilson's review. If a service is not specifically indicated in this report, do not assume it was performed.

2 FIELD ACTIVITIES

This section summarizes field activities performed between October 19 and November 2, 2020 to implement the GWP Addendum. Shannon & Wilson staff members Adam Wyborny, Environmental Engineer, Marcy Nadel, Geologist, and Veselina Yakimova, Geologist, conducted the initial site characterization effort described in this report. These individuals are State of Alaska Qualified Environmental Professionals as defined in 18 AAC 75.333[b].

Analytical sample locations are presented in Figure 3, Sample Location Overview. Soil boring logs are included in Appendix A. Copies of Shannon & Wilson's field notes and included in Appendix B.

2.1 Preparation and Permitting

Shannon & Wilson field staff completed *City of Nome Travel Activity Forms* prior to arrival to comply with local travel restrictions related to the COVID-19 pandemic.

DOT&PF Northern Region's construction engineer for upcoming repairs at OME coordinated with the FAA to obtain permission to use a drill rig near the active runways. On October 16, 2020, the FAA notified DOT&PF this effort would be classified as maintenance and a 7460 would not be required. Shannon & Wilson coordinated with the OME Airport Manager to schedule the runway closure to minimize impacts to airport operations. Shannon & Wilson also coordinated with DOT&PF's Division of Leasing, who determined a building permit was not required.

Shannon & Wilson prepared a Construction Safety and Phasing Plan (CSPP) related to sampling activities on and near active runways and taxiways. The CSPP documents project phasing, access and vehicle routes and other access details, badging, work zone lighting, and other relevant details. The draft CSPP was submitted on October 16, 2020. The CSPP was revised following the receipt of comments from DOT&PF Northern Region Engineering, Aviation Safety and Security, and the OME Airport Manager. The final CSPP was submitted October 22, 2020. The runway closure dates changed after the CSPP was written due to local weather conditions.

Adam Wyborny and Marcy Nadel obtained OME-issued identification badges with a driving endorsement. Badge training included airport access information, pavement markings, radio training, and other items. Prior to receiving their badges, field staff were escorted within the restricted area by OME personnel.

On October 21, field staff conducted a site reconnaissance with Airport Manager Darrin Otton. Mr. Otton summarized the use of AFFF on OME property and provided utility locate information. Section 1.2 and Figure 1 include this new information. Mr. Otton noted diesel odors were observed during the placement of a several-hundred-foot section of pavement west of the runway junction during the 2019 field season. The groundwater MW formerly located at the west end of Runway 10-28 was likely removed during construction of the Snake River embankment. The freshly laid pavement is visible in aerial photographs (Figures 3 and 6). DOT&PF's engineering staff also assisted with utility locates near the ARNG hangar.

2.2 Soil Sampling

Soil characterization activities for this project included surface and subsurface soil sample collection, described as follows.

2.2.1 Surface Soil

Shannon & Wilson field staff collected surface soil samples from the following locations:

- soil bordering the runway apron along Runway 3-21;
- the edge of the pavement and a low-lying area southwest of the ARNG hangar;
- within the AFFF spray area north of the ARFF building;
- in the General Aviation area west of the ARFF building;
- the edge of the pavement south of the ARFF building;
- within the AFFF spray area west of the runway junction;
- soil bordering the runway apron along Runway 10-28; and
- native soil south of runway 10-28.

The October 27, 2020 samples were collected immediately beneath the vegetation, where present, using hand tools. The October 29 through 30, 2020 samples were collected using a Bosch rotary hammer to penetrate frozen soil. Sample depth varied from one to three inches bgs. Samples were generally comprised of silty sand or sandy silt, some with gravel. Most of the samples were interpreted to be fill, not native soil.

Exhibit 2-1: Surface soil sample locations

Left: along the west side of Runway 3-21. Center: south of the ARNG hangar. Right: General Aviation area west of the ARFF building.

The soil near the ARFF building was field screened using a photoionization detector (PID) and submitted for BTEX, GRO, DRO, and RRO analysis (Figure 3), in addition to PFAS. The highest field-screening readings were 33 parts per million (ppm) in sample *SS-12* and 21 ppm in sample *SS-10*. The sample with the highest field-screening reading was also submitted for determination of PAHs.

Soil field duplicate samples were collected at a rate of one per day per analyte, including subsurface soil samples. A field blank sample was collected during sampling at the AFFF spray area north of the AFFF building. Two rinsate or equipment blank samples were collected by running PFAS-free water over the soil sampling tools. Copies of Shannon & Wilson's *Soil Sample Collection Logs* are included in Appendix B.

Sediment samples were collected from ponds and drainage ditches at the same locations as the surface water samples. This effort is described in Section 2.4.1.

2.2.2 Soil Borings

On behalf of DOT&PF, Shannon & Wilson retained the services of drilling contractor GeoTek Alaska, Inc. (GeoTek) to advance soil borings and install TWPs and long-term groundwater MWs. They used a Geoprobe Model 6620DT track-mounted drill rig. This drill is equipped with Macro-Core tooling, a solid barrel (2-inch outside diameter) direct-push device for collecting continuous core samples of unconsolidated materials at depth. Adam Wyborny observed the drilling and recovered soil for the purpose of determining lithology, collecting analytical soil samples, and preparing a descriptive log of soil conditions encountered during drilling. The boring logs are included in Appendix A. Copies of our *Soil Sample Collection Logs* are also included in Appendix B.

Drilling occurred primarily at nighttime between October 23 and 27, 2020. GeoTek staged their equipment and decontaminated the soil barrels away from the runways. GeoTek advanced 17 soil borings at the following locations:

- five soil borings along Runway 10-28, immediately south of the runway;
- two soil borings along Runway 3-21, one near each end;
- four one-foot soil borings within the runways where pavement integrity is compromised;
- south of the ARNG hangar;
- north of the ARFF building, within the AFFF release area; and
- two soil borings south of the ARFF building, within the planned storm drain replacement and apron settlement repair excavation areas;
- south of the ARFF building, between the building and Runway 10-28; and

- near the former ARFF building on the Southeast Apron.

Soil cores were field screened for volatile petroleum compounds using a PID. Most field screening readings were less than 2 ppm; however, soil from two borings registered above 20 ppm. The elevated PID readings were 32 ppm in boring ARFF-SB1 and 30 ppm in 10-28-SB4, both in the uppermost one ft. bgs. Soil drill cuttings for these borings were containerized in a 55-gallon drum pending receipt of analytical results. Shannon & Wilson did not observe a petroleum sheen on the soil or groundwater during drilling.

Exhibit 2-2: Drilling at the north end of Runway 3-21

Shannon & Wilson collected two PFAS soil samples from most of the deep borings, one each from 0 to 1 ft. bgs and approximately halfway between the surface and groundwater table. The precise sample intervals are shown in the boring logs (Appendix A) and analytical data tables. One soil sample was collected from the one-foot borings. A surface soil sample was not collected from boring 10-28-SB4 due to its proximity to the newly placed Runway 10-28 pavement and boring 10-28-SB7.

A third subsurface soil sample was collected from the groundwater smear zone for the four ARFF building vicinity borings and boring 10-28-SB4, due to the field screening results. The smear zone soil samples were submitted for GRO, DRO, and RRO analysis at each boring, and for PAH analysis in boring ARFF-SB3.

Shannon & Wilson had planned to drill to 40 ft. bgs to install MWs northwest and south of the ARFF building; however, the drill rig encountered permafrost at 15 ft. bgs in boring ARFF-SB4. GeoTek did not drill through permafrost to avoid spreading potentially PFAS-contaminated water to new portions of the aquifer. The drill rig also encountered refusal at 27 ft. bgs in boring ARFF-SB3. This soil boring was terminated at bedrock (see Exhibit 1-3). Upon completion the bore holes were patched with bentonite clay, pea gravel, and/or asphalt cold patch depending on the local ground surface.

2.3 Water Supply Well Search

Shannon & Wilson began the limited water supply well search by requesting relevant records from the City of Nome, Nome Joint Utility System, and DOT&PF. The well search areas are shown in Figure 2. Most of the developed parcels are within OME property. The

Nome City Clerk provided ArcGIS files containing parcel boundaries and partial ownership and utility connection information. DOT&PF provided a list of active lease holders. These records were used to prepare detailed maps for the well search field effort. DOT&PF leasing reported they are not aware of any active water supply wells at the OME. Shannon & Wilson mailed a letter and fact sheet to available addresses in the well search area (Appendix C). No responses were received to the advisory letter.

The Nome Joint Utility System provided as-built plans of the water system. Shannon & Wilson reviewed the plans, they contain the locations of water mains and some individual connections. The utility identified two areas where water supply wells may be present although they are near a water main: Prospect Street between Center Creek Road and Everts Air Cargo, and a section of Port Road (Figures 1 and 2). The Nome well search targeted drinking water supply wells. It is possible some properties connected to utility water also have secondary, non-potable wells.

The door-to-door well search began on October 24, 2020. Marcy Nadel and Veselina Yakimova visited the 15 properties identified by the utility. Most of the structures appeared to be used seasonally. Field staff made a reasonable attempt to contact the owners or occupants to inquire about their water source. When no one was present, personalized door tags were left on the door handles of developed properties. Field staff were unable to reach the occupants at three locations after multiple visits. Staff also drove through other portions of the well search area (232 parcels) to verify current property use and identify any new construction.

The well search identified two wells used seasonally for non-potable, industrial purposes. The GWP defines well categories based on use. Both identified wells are considered category 4: water supply wells used for outdoor purposes only, such as irrigation or vehicle washing. These wells are considered non-drinking water wells. Information provided to the property occupants is included in Appendix C.

2.3.1 Water Supply Well Sampling

Identified wells *PW-171* and *PW-181* had been winterized and were unable to be sampled using the property owner's pump (Figure 2). *PW-171* is powered by a generator, a tenant attempted to start the generator but was unable. This well could be sampled in the summertime, if desired.

Power to the well pump at *PW-181* had also been turned off. Field staff purged the well casing using a peristaltic pump and disposable tubing until parameters stabilized. A multiprobe water quality meter (YSI) was used to record pH, temperature, and conductivity approximately every three minutes. The following values were used to indicate stability for

a minimum of three consecutive readings: ±0.1 pH, ±0.5 degrees Celsius temperature, and ±3 percent conductivity. Following parameter stabilization, a water sample was collected for PFAS analysis. Copies of completed *Private Well Inventory Survey Forms* and *Residential Well Sampling Logs* are included in Appendix B.

2.4 Water Sampling

Water characterization activities for this project included sampling surface water and groundwater at and near the OME. Groundwater characterization was completed using both TWPs and MWs.

2.4.1 Surface Water and Sediment

Surface water sampling began on October 22, 2020, before shallow surface water bodies froze entirely. A thin layer of ice was present in several of the drainage ditches, the samplers broke the ice to access surface water and sediment. No petroleum odors or sheen were noted during sampling.

Surface water and collocated sediment samples were collected from the following drainage ditches and culverts:

- on the east side of Runway 3-21, north of the ARNG hangar;
- on the east side of Runway 3-21, west of the ARNG hangar near Taxiway Juliet;
- on the west side of Runway 3-21 opposite Taxiway Hotel;
- north of the junction of Runways 10-28 and 3-21; and
- inside the drainage culvert southwest of ARFF building.

Surface water and collocated sediment samples were also collected from the following ponds:

- east of the ARFF building and other Northeast Apron hangars, east of Doyle Road;
- east of the FAA Housing Complex;
- southeast of the Northwest Apron hangars, west of Doyle Road; and
- between Doyle and Center Creek Roads, west of the eastern end of Runway 10-28.

A surface water sample only was collected from the following creeks or streams:

- southwest of the ARNG hangar, and
- near the eastern end of Runway 10-18.

The samples were collected using a new, PFAS-free disposable transfer container or the laboratory-supplied sample container. Most of the samples were collected within an arm's reach from the edge of the water. No reusable equipment was employed to sample the surface water or sediment. Two surface water and two sediment field duplicate samples were collected, one during each day of sampling. The surface water and sediment samples were submitted for PFAS analysis. Copies of Shannon & Wilson's *Surface Water Sample Logs* are included in Appendix B.

2.4.2 Temporary Well Points

GeoTek installed TWPs at nine of the soil-boring locations:

- northeast of Runway 3-21, south of the Nome Monofil;
- at the north and south ends of Runway 3-21;
- south of the ARNG hangar;
- north of Runway 10-28 near DOT&PF gravel pits and material stockpiles;
- three TWPs south of Runway 10-28, including one within the AFFF spray area west of the runway junction; and
- near the former ARFF building on the Southeast Apron.

The TWPs were purged using new, PFAS-free peristaltic pump tubing. Following parameter stabilization, PFAS groundwater samples were collected from each of the TWPs. The samplers observed a fuel odor during groundwater sampling south of the ARNG hangar; this sample was submitted for petroleum compounds in addition to PFAS. Groundwater recharge at locations GP-TWP and Lndfl-TWP was considerably slower than at the other locations, and the water was turbid at the time of sampling. Copies of *Monitoring Well Sampling Logs*, used for TWP sampling, are included in Appendix B.

Samples *ANG-TWP-01* / *ANG-TWP-02* and *3-21-TWP-04* / *3-21-TWP-05* were collected from TWPs advanced using a steel SP sampler and disposable PVC screen. The other TWP samples were collected from points made entirely of PVC so the casing could be cut down to the ground surface close to the runways. The TWPs were removed from the ground after sampling, drained, and materials placed in an onsite dumpster. The bore holes were backfilled with bentonite clay to within approximately two ft. bgs and with pea gravel to the surface.

2.4.3 Monitoring Wells

Shannon & Wilson sampled five MWs on or near OME property.

2.4.3.1 Installation

GeoTek installed three groundwater MWs using a hollow stem auger with the Geoprobe Model 6620DT drill rig. The wells were located as follows:

- OME-MW02-15 within the AFFF release area north of the ARFF building; and
- two wells (OME-MW01-15 and -30) south of the ARFF building, near the windsock between the building and Runway 10-28.

Only one well was installed north of the ARFF building because permafrost was encountered at 15 ft. bgs. The well was set directly above the permafrost. The deeper well in the nest south of the ARFF building was screened from 25 ft. to 30 ft. bgs because GeoTek encountered shallow bedrock. The approximate (rounded) depth of the MW is denoted in the well name (i.e. MW01-15 was installed at approximately 15 ft. bgs). Boring Logs are included in Appendix A.

GeoTek completed the wells using flush-mounted monuments. The wells were constructed using two-inch inside-diameter schedule 40 PVC material. The two shallow wells have a 10-ft. screened interval, the 30-ft. well has a 5-ft. screened interval. The screens are pre-pack 0.010-inch slotted screen with 20/40 sand and threaded end caps. The filter pack within the 8-inch annular space at and around the screened interval is comprised of 10/20 silica sand. A bentonite chip seal followed by pea gravel fills the remaining annul space. Well construction details can be found in the individual boring logs (Appendix A) and field forms (Appendix B).

Eric Tweet, PLS, of Norton Sound Survey surveyed the MW casing elevations on October 28, 2020. Survey information is included in Appendix D, Groundwater Gradient Data. Shannon & Wilson used the survey information and depth-to-water measurements to calculate groundwater gradient using the U.S. Environmental Protection Agency's On-line Tools for Site Assessment Calculation website.

These calculations indicate the groundwater flow direction is towards the southwest with a heading of 236 degrees from north (Appendix D). The groundwater flow direction is considered approximate because it is based on only four data points, and the groundwater elevation difference between nested wells OME-MW01-15 and -30 is larger than anticipated. This difference may be attributed to tidal impacts on groundwater elevation, densely packed silts within the OME-MW01-15 screened interval, or other factors.

2.4.3.2 Development and Sampling

The MWs were developed using an inertial pump and stiff tubing with a foot value or surge block. Development proceeded until there was a significant improvement in the clarity of

the water. Due to the abundance of silt, the MWs did not produce clear water after pumping 50 gallons or more from each well. OME-MW01-15 had particularly silty water, approximately 140 gallons were purged. The development water was containerized and moved indoors to prevent freezing while the sediment settled from suspension. Copies of *Well Development Logs* are included in Appendix B.

Following development, a submersible pump was used to purge the well until the water parameters stabilized or a total of three well volumes had been purged. Field staff measured these parameters using a YSI and recorded pH, temperature in degrees Celsius (°C), conductivity in microSiemens (µS), dissolved oxygen (DO) in milligrams per liter (mg/L), and redox potential in millivolts (mV) approximately once every three minutes until sample collection. The following values were used to indicate stability for a minimum of three consecutive readings: ±0.1 pH, ±3 percent °C, ±10 percent DO, ±3 percent conductivity, and ±10mV redox. Water clarity (visual) was also recorded.

Exhibit 2-3: Groundwater MW sampling

The water samples were collected using laboratory-supplied containers immediately after each well was purged. Samples were collected for PFAS, GRO, DRO, RRO, and BTEX analysis from the three newly installed MWs. OME-MW02-15 was also sampled for PAHs. Copies of the *Monitoring Well Sampling Logs* are included in Appendix B, Field Forms.

Groundwater field-duplicate samples were collected at a rate of one per day. A submersible pump equipment blank sample was collected after the last well was sampled on October 31, 2020. A field blank sample was also collected at OME-MW01-15.

2.4.3.3 Existing Wells

Shannon & Wilson sampled two existing MWs using the procedures described above (Figure 3). These wells were located:

- near the western end of Runway 10-28 across the Snake River (MW-D5-01); and
- south of the former FAA Flight Service Station on the Southeast Apron (MW-5 / MW-6).

The MWs were 24 ft. and 18 ft. deep, respectively. MW-D5-01 is placed in mine tailings that form a small hill above the Snake River. This sample was collected using a peristaltic pump.

The former Flight Services Station well was sampled using a submersible pump. These samples were submitted for PFAS analysis.

2.5 Sample Custody, Storage, and Shipping

Field staff collected, handled, and stored samples in a manner consistent with the GWP and DEC Field Sampling Guidance. Immediately after collection, the samples were placed in a designated sample cooler maintained between 0 °C and 6 °C with ice substitute. The PFAS samples were stored in individual Ziploc bags. Shannon & Wilson maintained custody of the samples until submitting them to the laboratory for analysis. The samples were stored in sample coolers or a small in-room refrigerator at nighttime.

When shipping the analytical samples, chain-of-custody forms were placed in the hard-sided cooler with an adequate quantity of frozen ice substitute to maintain the proper temperature range. The samples were packaged as necessary to prevent bottle breakage and sealed with custody seals on the outside of each cooler. Field staff shipped the samples to Anchorage, Alaska. The PFAS samples were accepted by a Shannon & Wilson Anchorage staff member who immediately re-shipped the samples to Eurofins TestAmerica Laboratories (TestAmerica) in West Sacramento, California using Alaska Air Cargo's Goldstreak service. The non-PFAS samples were received by SGS North America, Inc. (SGS) and delivered to their Anchorage laboratory by courier.

Most of the samples were received by the laboratory within the required temperature range. However, four of the sample containers for groundwater sample *OME-MW02-15* and *Trip Blank 1* contained ice when they arrived at SGS. Quality assurance (QA)/qualify control details (QC) can be found in Appendix E.

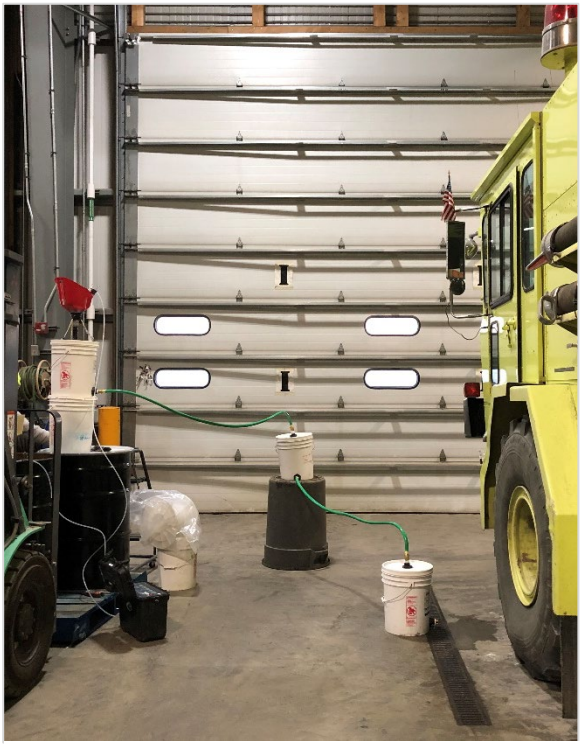

Exhibit 2-4: Filtering MW development water

2.6 Investigation-Derived Waste

MW and TWP development and purge water, and decontamination rinse water were filtered using three, new five-gallon granular activated carbon (GAC) units in series (Exhibit 2-4). Silty MW development water was allowed to settle prior to filtration. The filtered water

was discharged to the ground surface next to each sample location or into the DOT&PF shop sump. Sample *GAC-POST* was collected from the final unit effluent after filtration.

Soil cuttings from borings ARFF-SB1 and 10-28-SB4 were containerized in a 55-gallon drum. Soil from these borings had PID readings above 20 ppm. The bottom-of-the-drum MW purge water that was too silty to filter was also placed in the investigation-derived waste drum. The labeled drum containing approximately 18 gallons of investigation-derived waste is stored onsite. Soil cuttings from the other borings were spread on the ground surface at each sample location.

MW and TWP tubing, direct push soil liners, nitrile gloves, and other inert investigation-derived waste were disposed of in an onsite dumpster.

2.7 Deviations

In general, Shannon & Wilson conducted these services in accordance with the approved GWP Addendum. The following are the deviations from our agreed-upon scope of services. These modifications do not impact the overall data quality or project aims.

- Shannon & Wilson collected four additional surface soil samples than planned (*SS-24* to *SS-29*). These samples were collected from the AFFF spray area southwest of the runway junction. In addition, the TWP nearest this spray area was moved to characterize PFAS contamination within a potential source area.
- Soil boring AKA-SB1 and a corresponding TWP were added at the former ARFF building.
- Several sample locations were moved based on local conditions and information provided by DOT&PF staff.
- The GWP Addendum described installing two MW nests, each with wells screened to span the groundwater table and from 35 to 40 ft. bgs. Shannon & Wilson installed three MWs due to local subsurface conditions (see Sections 2.2.2. and 2.4.3).

3 ANALYTICAL RESULTS

The soil, sediment, and water samples submitted for this project were analyzed for determination of the 18 PFAS compounds listed in Environmental Protection Agency Method 537.1. The PFAS samples were analyzed by TestAmerica in West Sacramento, California. In addition, Shannon & Wilson submitted select soil and groundwater samples for analysis of GRO, DRO, RRO, BTEX, and PAHs by Methods AK101, AK102, AK103, 8260D, and 8270D SIM, respectively. These samples were analyzed by SGS in Anchorage, Alaska.

The OME analytical results are summarized in Tables 1 to 9. Analytical sample QA/QC are summarized in Appendix E. The TestAmerica and SGS laboratory reports and DEC Laboratory Data Review Checklists for each work order are also included in Appendix E. Figures 3 shows the various sample locations, while Figures 4 through 10 display analytical results.

3.1 Surface Soil

PFOS was detected at concentrations exceeding the DEC migration-to-groundwater soil cleanup level of 3.0 µg/kg in samples *SS-02*, *SS-08*, *SS-09*, *SS-12*, *SS-13*, and *SS-14*. In addition, PFOA was detected at a concentration above the DEC cleanup level of 1.7 µg/kg in sample *SS-13*. These surface soil samples are located at the southern end of Runway 3-21 (*SS-02*), within the AFFF spray area north of the ARFF building (*SS-09* through *SS-12*), and south of the ARFF building (*SS-13* and *SS-14*). The PFOS concentration in *SS-13* is 60 times the cleanup level, while the other exceedances are between 1 and 5 times the PFOS or PFOA cleanup level.

PFHxS (perfluorohexanesulfonic acid) was detected at up to 9.1 µg/kg and perfluorohexanoic acid (PFHxA) at up to 5.6 µg/kg in surface soil samples near the ARFF building (*SS-12* and *SS-13*). Several other PFAS compounds were detected at low concentrations below the laboratory reporting limit (RL) in nearly all of the samples. PFAS results for surface soil samples are summarized in Table 1 and shown on Figures 4 and 5.

The surface soil samples near the ARFF building were also submitted for analysis of petroleum compounds. DRO were detected at concentrations exceeding the DEC MTG cleanup level of 250 milligrams per kilogram (mg/kg) in field duplicate pair *SS-10* / *SS-11*. RRO were detected in each of the petroleum surface soil samples, but at concentrations below the DEC MTG cleanup level of 11,000 mg/kg. GRO and BTEX were not detected above the limit of quantitation (LOQ) in any of the samples submitted for those analyses. Petroleum results for surface soil samples are summarized in Table 2 and Figure 6.

3.2 Soil Borings

PFOS was detected at concentrations exceeding the DEC MTG cleanup level in samples *ARFF-SB2-01*, *ARFF SB3-01*, *AKA-SB1-01*, and field duplicate pair *AKA-SB1-02* / *AKA-SB1-03*. These samples were collected in the uppermost one ft. bgs near the current ARFF building, and from the uppermost 1 ft. and 6 to 7 ft. bgs near the former ARFF building. Several other PFAS compounds were detected at low concentrations. PFAS results for subsurface soil samples are summarized in Table 3 and Figure 7. The PFOA results are not depicted in a figure because PFOA was not encountered above the DEC MTG cleanup level in any of the soil borings.

Exhibit 3-1: Soil boring 10-28-SB6

In addition to PFAS samples, subsurface soil from the groundwater smear zone for five soil borings was submitted for analysis of petroleum compounds. Four of these borings are located near the ARFF building. The fifth boring, 10-28-SB4, is west of the junction of Runways 10-28 and 3-21. DRO were detected at concentrations up to 19.7 mg/kg, or less than 10 percent of the DEC MTG cleanup level. RRO were detected in two of the five smear zone samples at concentrations below the DEC MTG cleanup level. GRO, BTEX, and PAH compounds were not detected above the LOQ in any of the samples submitted for those analyses. Petroleum results for the subsurface soil samples are summarized in Table 4.

3.3 Sediment

One or more PFAS compounds were detected at low concentrations below 1.0 µg/kg in samples *SD-01*, *SD-06*, *SD-08*, field duplicate pair *SD-10* / *SD-11*, and *SD-13*. Most of these detections were below the RL for each compound. PFOS was detected at 2.8 µg/kg in sample *SD-13*, collected from the culvert that originates near the southwest corner of the ARFF building. None of the 18 PFAS compounds were detected in samples *SD-02* / *SD-03*, *SD-04*, *SD-09*, and *SD-12*. PFAS results for the sediment samples are summarized in Table 5. The sediment sample locations and corresponding surface water sample locations are depicted in Figure 8.

3.4 Water Supply Well

PFOS and PFOA were detected at concentrations below the U.S. Environmental Protection Agency's lifetime health advisory level of 70 ng/L in the single private well sample collected for this project. PFAS compounds PFHxS, PFHxA, perfluoroheptanoic acid (PFHpA), and perluorobutanesulfonic acid (PFBS) were also detected in this sample. The highest concentrations were 6.3 ng/L (PFOS) and 6.2 ng/L (PFHxS). Water supply well sample *PW-181* was collected from a non-potable well located [redacted]. PFAS results for the water supply well sample are summarized in Table 6. The sample location is depicted in Figures 2 and 3.

3.5 Surface Water

PFAS compounds PFOS, PFOA, PFHxS, PFHxA, PFHpA, and PFBS were detected in each of the surface water samples, with the exception of sample *SW-04* where only PFOS, PFHxS, and PFHpA were detected. In addition, perfluorononanoic acid (PFNA) and perfluorodecanoic acid (PFDA) were also detected in surface water sample *SW-13*, collected from within the ARFF building culvert. Many detections were below the RL for these compounds. The other 10 PFAS compounds were not detected in any of the surface water samples.

Exhibit 3-2: Surface water sampling

The highest detected PFOS result was 150 ng/L in sample *SW-13*, or approximately one-third of the DEC groundwater cleanup level. The next highest PFOS detection was 41 ng/L in *SW-6*, or approximately one-tenth of the cleanup level. PFAS results for surface water samples are summarized in Table 7. The surface water and corresponding sediment sample locations are depicted in Figure 8.

3.6 Groundwater

PFOS and PFOA were detected at more than twice the DEC groundwater cleanup level of 400 ng/L for each compound in groundwater sample *AKA-TWP-01*, south of Runway 10-28 and near the former ARFF building. Sample *AKA-TWP-01* also contained elevated concentrations of three other PFAS compounds: 6,500 ng/L PFHxA, 2,000 ng/L PFHpA, and 1,300 ng/L PFHxS. These three PFAS were also reported at notable but much lower concentrations in sample *OME-MW02-15* (270 ng/L, 54 ng/L, and 180 ng/L, respectively) and field duplicate pair *10-28-TWP-05* / *10-28-TWP-04* (170 ng/L, 52 ng/L, and 330 ng/L, respectively). These samples were collected from a TWP south of the current ARFF building, and from the foam release area north of the ARFF building.

Exhibit 3-3: Groundwater sampling from a TWP

PFOS or PFOA were detected in each of the groundwater samples except for sample *10-28-TWP-02*, near the west end of Runway 20-28. These sample results are compared to the groundwater cleanup level because the groundwater is not thought to be a drinking water source. However, we note PFOS was detected above 70 ng/L in four of the groundwater samples. PFHxA, PFHpA, PFHxS, PFNA, and PFBS were also detected in nearly every groundwater sample. In samples *10-28-TWP-02*, *GP-TWP-01*, and *MW-D5-01* these PFAS compounds are detected at concentrations below or near the RL. These groundwater samples were collected from the west side of the OME or off airport property to the southwest. PFAS results for the groundwater samples are summarized in Table 8 and Figure 9.

A subset of groundwater samples were submitted for analysis of petroleum compounds. DRO were detected at a concentration exceeding the DEC groundwater cleanup level of 1.5 mg/L in field duplicate pair *ANG-TWP-01* / *ANG-TWP-02*. RRO, benzene, and ethylbenzene were also detected in these samples below their respective cleanup levels. These samples were collected from a TWP south of the ARNG hangar. Additionally, benzene was detected in sample *OMG-MW01-15* below the DEC groundwater cleanup level. Petroleum results for the groundwater samples are summarized in Table 9 and Figure 10.

PFOS was detected at 2.3 ng/L in the post-filtration water sample. PFOA and several other PFAS compounds were detected at concentrations below the laboratory detection limit. Sample *GAC-POST* is also included in Table 8.

4 CONCEPTUAL SITE MODEL

A conceptual site model (CSM) describes potential pathways between a contaminant source and possible receptors (i.e., people, animals, and plants) and is used to determine who may be at risk of exposure to those contaminants. This section describes the suspected contaminant sources, migration and exposure pathways, and potential receptors on the DEC Human Health Conceptual Site Model Scoping and Graphic Forms included in Appendix F. The contaminants of concern at and near the OME are PFOS, PFOA, and DRO.

A draft CSM was included in the GWP Addendum describing planned site characterization activities. The enclosed CSM has been updated based on observed site conditions and the analytical results discussed in Section 3.

4.1 Description of Potential Receptors

Shannon & Wilson considers commercial/industrial workers, site visitors or trespassers, and construction workers to be current or future potential receptors for one or more exposure pathway. Residents are considered insignificant receptors. There were no soil or surface water samples with PFOS, PFOA, or DRO exceeding cleanup levels outside the OME fence. DOT&PF and FAA personnel, airline or cargo employees, ARNG workers, emergency responders, and private pilots are permitted within portions of the OME restricted area. Shannon & Wilson does not consider recreational users, farmers, subsistence harvesters, or subsistence consumers to be potential receptors.

4.2 Potential Exposure Pathways

Potential exposure pathways include incidental ingestion of soil or groundwater, dermal exposure to soil or groundwater, and inhalation of fugitive dust.

4.2.1 Soil Exposure

DOT&PF personnel and tenants could inhale wind-blown dust during outdoor, summertime work. The surface soil and fill at OME have a moderate to high silt content that likely allows for small respirable particles (i.e., less than 10 micrometers).

Direct contact with PFOS-, PFOA-, or DRO-contaminated surface and subsurface soil is unlikely during normal operations. However, future runway repairs and other construction will expose contaminated soil. The DOT&PF plans to replace a storm drain and repair apron settlement south of the ARFF building in 2021 or 2022. This effort will expose PFOS- and PFOA-contaminated surface and subsurface soil described in Section 3. Runway rehabilitation at the southern end of Runway 3-21 could also expose PFOS-contaminated soil.

4.2.2 Groundwater Exposure

Industrial workers, construction workers, or site visitors could be exposed to shallow contaminated groundwater during future excavation and construction projects. Groundwater was encountered between 7.5 and 10 ft. bgs south of the ARFF building.

Exposure of residents and commercial or industrial workers to PFAS-impacted groundwater through ingestion or dermal absorption is considered insignificant. Hangars

and offices on airport property are connected to the City of Nome water system. The well search did not identify any household water supply wells used for drinking or cooking. Identified water supply wells near the OME are used for industrial purposes only. Property owners near the OME report the water has high metals concentrations, including arsenic at levels exceeding drinking water standards. Groundwater is therefore unlikely to be used for drinking, bathing, and other household uses in the future.

4.2.3 Other Media

Ingestion or dermal absorption of surface water, direct contact with sediment, and inhalation of indoor air are not considered complete exposure pathways because the contaminants of concern were not detected above DEC cleanup levels in surface water, groundwater, or sediment. However, this conclusion should be reevaluated if regulatory standards change.

Ingestion of wild harvested foods is not considered a complete exposure pathway because the public is not permitted to access areas with PFOS, PFOA, and DRO above DEC cleanup levels.

5 DISCUSSION AND RECOMMENDATIONS

The site characterization effort described in this report discovered PFAS contamination in onsite soil and groundwater. PFOS and PFOA were not identified above DEC cleanup levels in surface water or sediment. None of the samples exceeding regulatory standards are from the west side of the OME, or upgradient of the runways.

The primary PFAS source areas identified during this investigation appear to be the current and former ARFF buildings (Figure 1). PFAS compounds were found in surface and subsurface soil within the AFFF spray area north of the ARFF building, but at lower concentrations than by the ARFF buildings (Figures 4 and 9). The AFFF spray area southwest of the runway junction does not appear to be a current PFAS source area based on groundwater results. This spray area is within the Snake River floodplain.

The highest PFAS subsurface soil and groundwater concentrations were from the former ARFF building (Tables 3 and 8). This area is partially paved. The asphalt parking area may be reducing the spread of PFAS-contaminated surface water by preventing stormwater infiltration into the soil. However, the highest PFAS groundwater concentrations were found at this location (sample *AKA-TWP-01*, Figure 9 and Table 8). It is unknown if the PFAS groundwater plume extends offsite, south of the OME.

PFAS soil sample concentrations near the current ARFF building decrease with depth. Also, PFOS, PFOA, and PFHxS concentrations in this area are highest downhill of the building, at the edge of the paved area. These results are consistent with periodic AFFF surface releases before and after the area was paved (Figures 4 and 5, Table 1).

The water supply well search confirmed municipal water is the primary source of drinking water at and downgradient of the OME. PFOS and PFOA were found below the U.S. Environmental Protection Agency's lifetime health advisory level for drinking water in the one sampled water-supply well (Figure 2). Drinking water exposure to PFAS-contaminated groundwater is considered insignificant.

This effort identified hydrocarbon contamination at two locations, near the current ARFF building and ARNG hangar. DRO were encountered above DEC MTG cleanup levels in soil or groundwater north and northwest of the ARFF building. Surface soil exceeded the cleanup level in an area accessible to vehicle and plane traffic (Table 2 and Figure 6). DRO were found in groundwater downgradient of the ARNG hangar and aboveground fuel tanks (Table 9 and Figure 10). In subsurface soils, the elevated PID field screening readings were in soil borings near an underground fuel tank (ARFF-SB1) and known fuel contamination (10-28-SB4). Soil samples from these borings did not exceed regulatory standards for DRO, PFOS, or PFOA. These analytical and field-screening results are attributed to activities other than AFFF fire training.

Based on the results of Shannon & Wilson's initial site characterization effort, we recommend the DOT&PF:

- complete a soil management plan for construction work planned near the current ARFF building (see Section 4.2.1 and Appendix F);
- excavate surface soil with PFOS or PFOA concentrations exceeding DEC MTG cleanup levels;
- install additional MWs to characterize the lateral and vertical extent of PFAS-impacted groundwater, particularly south of the former ARFF building;
- monitor PFAS water sample concentrations in the 2020 MWs annually; and
- dispose of remaining investigation-derived waste by spreading the drum contents onsite (see Section 2.6).

These recommendations are based on:

- Site conditions observed at and near the OME in October and November 2020.
- The results of testing performed on soil and sediment samples collected borings, the soil surface, and water bodies on and near the OME.

- The results of testing performed water samples collected from the TWPs, MWs, surface water, and private wells on, near, and downgradient of the OME.
- Shannon & Wilson's previous experience at the OME.
- Publicly available literature and data reviewed for this project.
- Shannon & Wilson's understanding of the project and information provided by DOT&PF and other members of the project team.
- The limitations of our approved scope and schedule described in our approved proposal dated September 2, 2020.

The information included in this report is based on limited sampling and should be considered representative of the times and locations at which the sampling occurred. Regulatory agencies may reach different conclusions than Shannon & Wilson. We have prepared and included the attachment "Important Information about your Geotechnical/Environmental Report" to assist you and others in understanding the use and limitations of this report.

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Table 1 - Surface Soil PFAS Analytical Results

	Sample Name		SS-01	SS-02	SS-03	SS-04		SS-06	SS-07	SS-08	SS-09	SS-10	
Analyte	Cleanup Level	Units	10/27/20	10/27/20	10/27/20	10/27/20	10/27/20 (DUP)	10/27/20	10/27/20	10/29/20	10/29/20	10/29/20	10/29/20 (DUP)
Perfluorohexanesulfonic acid (PFHxS)	-	µg/kg	0.096 J	0.51	<0.21	0.036 J	<0.22	<0.22	0.040 J	3.7	0.76	0.26	0.24
Perfluorohexanoic acid (PFHxA)	-	µg/kg	<0.22	0.19 J	<0.21	<0.22	<0.22	<0.22	<0.21	0.58	0.30	0.32	0.25
Perfluoroheptanoic acid (PFHpA)	-	µg/kg	<0.22	0.070 J	<0.21	<0.22	<0.22	<0.22	<0.21	0.18 J	0.062 J	0.087 J	0.069 J
Perfluorononanoic acid (PFNA)	-	µg/kg	<0.22	0.084 J	0.078 J	<0.22	<0.22	<0.22	<0.21	0.77	0.061 J	<0.20	<0.20
Perfluorobutanesulfonic acid (PFBS)	-	µg/kg	<0.22	0.042 J	<0.21	<0.22	<0.22	<0.22	<0.21	0.083 J	0.028 J	<0.20	<0.20
Perfluorodecanoic acid (PFDA)	-	µg/kg	<0.22	0.39	0.040 J	<0.22	<0.22	<0.22	<0.21	4.4	<0.22	0.073 J	0.069 J
Perfluoroundecanoic acid (PFUnA)	-	µg/kg	<0.22	0.31	<0.21	<0.22	<0.22	<0.22	<0.21	0.48	<0.22	<0.20	<0.20
Perfluorododecanoic acid (PFDoA)	-	µg/kg	<0.22	0.27	<0.21	<0.22	<0.22	<0.22	<0.21	1.4	<0.22	<0.20	<0.20
Perfluorotridecanoic acid (PFTrDA)	-	µg/kg	<0.22	0.12 J	<0.21	<0.22	<0.22	<0.22	<0.21	0.36	<0.22	<0.20	<0.20
Perfluorotetradecanoic acid (PFTeA)	-	µg/kg	<0.22	<0.22	<0.21	<0.22	<0.22	<0.22	<0.21	0.84	<0.22	<0.20	<0.20
N-Methyl perfluorooctane sulfonamidoacetic acid (N-	-	µg/kg	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.1	<2.4	<2.2	<2.0	<2.0
N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	-	µg/kg	<2.2	<2.2	<2.1	<2.2	<2.2	<2.2	<2.1	<2.4	<2.2	<2.0	<2.0
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	-	µg/kg	<0.22	<0.22	<0.21	<0.22	<0.22	<0.22	<0.21	<0.24	<0.22	<0.20	<0.20
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	-	µg/kg	<0.22	<0.22	<0.21	<0.22	<0.22	<0.22	<0.21	<0.24	<0.22	<0.20	<0.20
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	-	µg/kg	<0.22	<0.22	<0.21	<0.22	<0.22	<0.22	<0.21	<0.24	<0.22	<0.20	<0.20
Hexafluoropropylene oxide dimer acid (HFPO-DA)	-	µg/kg	<0.28	<0.27	<0.26	<0.27	<0.28	<0.27	<0.26	<0.30	<0.27	<0.25	<0.26
Perfluoro-octane sulfonate (PFOS)	3.0	µg/kg	1.6	**7.7**	0.22 J	0.26 J	0.22 J	0.23 J	0.54	**5.8**	**4.5**	1.6	1.6
Perfluoro-octanoic acid (PFOA)	1.7	µg/kg	<0.22	0.16 J	<0.21	<0.22	<0.22	<0.22	<0.21	1.0	0.28	0.099 J	<0.20

µg/kg micrograms per kilogram
\- Cleanup level not established for this analyte.
< Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures.
Bold Concentration exceeds Department of Environmental Conservation (DEC) under-40-inch zone migration-to-groundwater soil cleanup level.
DUP Field-duplicate sample
J Estimated concentration, detected greater than the method detection limit (MDL) and less than the RL. Flag applied by the laboratory.
J* Result considered estimated due to a QC failure. Flag applied by Shannon & Wilson, Inc.

Table 1 - Surface Soil PFAS Analytical Results

Analyte	Cleanup Level	Units	Sample Name: SS-12	SS-13	SS-14	SS-15	SS-16	SS-17	SS-18	SS-19	SS-20	SS-21	SS-22
			10/29/20	10/29/20	10/29/20	10/29/20	10/29/20	10/29/20	10/30/20	10/30/20	10/30/20	10/30/20	10/30/20
Perfluorohexanesulfonic acid (PFHxS)	-	µg/kg	0.58	9.1	3.9	0.14 J	0.044 J	0.084 J	0.12 J	<0.21	0.051 J*	0.040 J	0.035 J
Perfluorohexanoic acid (PFHxA)	-	µg/kg	5.6	1.3	0.72	<0.22	0.053 J	<0.21	<0.20	<0.21	<0.21	<0.21	<0.21
Perfluoroheptanoic acid (PFHpA)	-	µg/kg	0.12 J	0.41	0.15 J	<0.22	0.037 J	<0.21	<0.20	<0.21	<0.21	<0.21	<0.21
Perfluorononanoic acid (PFNA)	-	µg/kg	<0.20	0.38	0.11 J	0.099 J	0.044 J	0.041 J	<0.20	<0.21	<0.21	<0.21	<0.21
Perfluorobutanesulfonic acid (PFBS)	-	µg/kg	0.35	0.13 J	0.15 J	<0.22	<0.21	<0.21	<0.20	<0.21	<0.21	<0.21	<0.21
Perfluorodecanoic acid (PFDA)	-	µg/kg	0.084 J	0.29	0.20 J	0.13 J	0.078 J	<0.21	<0.20	<0.21	0.034 J	0.025 J	<0.21
Perfluoroundecanoic acid (PFUnA)	-	µg/kg	<0.20	<0.24	<0.22	<0.22	<0.21	<0.21	<0.20	<0.21	<0.21	<0.21	<0.21
Perfluorododecanoic acid (PFDoA)	-	µg/kg	<0.20	0.087 J	<0.22	<0.22	<0.21	<0.21	<0.20	<0.21	<0.21	<0.21	<0.21
Perfluorotridecanoic acid (PFTrDA)	-	µg/kg	<0.20	<0.24	<0.22	<0.22	<0.21	<0.21	<0.20	<0.21	<0.21	<0.21	<0.21
Perfluorotetradecanoic acid (PFTeA)	-	µg/kg	<0.20	<0.24	<0.22	<0.22	<0.21	<0.21	<0.20	<0.21	<0.21	<0.21	<0.21
N-Methyl perfluorooctane sulfonamidoacetic acid (N-	-	µg/kg	<2.0	<2.4	<2.2	<2.2	<2.1	<2.1	<2.0	<2.1	<2.1	<2.1	<2.1
N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	-	µg/kg	<2.0	<2.4	<2.2	<2.2	<2.1	<2.1	<2.0	<2.1	<2.1	<2.1	<2.1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	-	µg/kg	<0.20	<0.24	<0.22	<0.22	<0.21	<0.21	<0.20	<0.21	<0.21	<0.21	<0.21
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	-	µg/kg	<0.20	<0.24	<0.22	<0.22	<0.21	<0.21	<0.20	<0.21	<0.21	<0.21	<0.21
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	-	µg/kg	<0.20	<0.24	<0.22	<0.22	<0.21	<0.21	<0.20	<0.21	<0.21	<0.21	<0.21
Hexafluoropropylene oxide dimer acid (HFPO-DA)	-	µg/kg	<0.26	<0.30	<0.27	<0.28	<0.27	<0.26	<0.25	<0.27	<0.26	<0.26	<0.26
Perfluoro-octane sulfonate (PFOS)	3.0	µg/kg	**3.7**	**180 J***	**13**	2.4	0.48 J	1.5	1.6	0.31 J	0.38 J	0.82	0.43 J
Perfluoro-octanoic acid (PFOA)	1.7	µg/kg	0.13 J	**1.9**	0.63	0.099 J	<0.21	<0.21	<0.20	<0.21	<0.21	<0.21	<0.21

µg/kg micrograms per kilogram
\- Cleanup level not established for this analyte.
< Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures.
Bold Concentration exceeds Department of Environmental Conservation (DEC) under-40-inch zone migration-to-groundwater soil cleanup level.
DUP Field-duplicate sample
J Estimated concentration, detected greater than the method detection limit (MDL) and less than the RL. Flag applied by the laboratory.
J* Result considered estimated due to a QC failure. Flag applied by Shannon & Wilson, Inc.

Table 1 - Surface Soil PFAS Analytical Results

Analyte	Cleanup Level	Units	Sample Name: SS-23	SS-24	SS-25	SS-26		SS-28	SS-29	SS-30	SS-31
			10/30/20	10/30/20	10/30/20	10/30/20	10/30/20 (DUP)	10/30/20	10/30/20	10/30/20	10/30/20
Perfluorohexanesulfonic acid (PFHxS)	-	µg/kg	0.068 J	0.086 J	0.037 J	0.037 J	0.034 J	0.058 J	0.041 J	<0.22	0.049 J
Perfluorohexanoic acid (PFHxA)	-	µg/kg	<0.28	<0.25	<0.24	<0.22	<0.22	0.069 J	<0.23	<0.22	<0.22
Perfluoroheptanoic acid (PFHpA)	-	µg/kg	<0.28	<0.25	<0.24	<0.22	<0.22	<0.22	<0.23	<0.22	<0.22
Perfluorononanoic acid (PFNA)	-	µg/kg	<0.28	0.053 J	<0.24	<0.22	<0.22	0.12 J	<0.23	<0.22	<0.22
Perfluorobutanesulfonic acid (PFBS)	-	µg/kg	<0.28	<0.25	<0.24	<0.22	<0.22	<0.22	<0.23	<0.22	<0.22
Perfluorodecanoic acid (PFDA)	-	µg/kg	0.036 J*	<0.25	<0.24	0.066 J	0.082 J	0.75	<0.23	<0.22	<0.22
Perfluoroundecanoic acid (PFUnA)	-	µg/kg	<0.28	<0.25	<0.24	<0.22	<0.22	0.35	<0.23	<0.22	<0.22
Perfluorododecanoic acid (PFDoA)	-	µg/kg	<0.28	<0.25	<0.24	<0.22	<0.22	0.29	<0.23	<0.22	<0.22
Perfluorotridecanoic acid (PFTrDA)	-	µg/kg	<0.28	<0.25	<0.24	<0.22	<0.22	0.086 J	<0.23	<0.22	<0.22
Perfluorotetradecanoic acid (PFTeA)	-	µg/kg	<0.28	<0.25	<0.24	<0.22	<0.22	<0.22	<0.23	<0.22	<0.22
N-Methyl perfluorooctane sulfonamidoacetic acid (N-	-	µg/kg	<2.8	<2.5	<2.4	<2.2	<2.2	<2.2	<2.3	<2.2	<2.2
N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	-	µg/kg	<2.8	<2.5	<2.4	<2.2	<2.2	<2.2	<2.3	<2.2	<2.2
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	-	µg/kg	<0.28	<0.25	<0.24	<0.22	<0.22	<0.22	<0.23	<0.22	<0.22
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	-	µg/kg	<0.28	<0.25	<0.24	<0.22	<0.22	<0.22	<0.23	<0.22	<0.22
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	-	µg/kg	<0.28	<0.25	<0.24	<0.22	<0.22	<0.22	<0.23	<0.22	<0.22
Hexafluoropropylene oxide dimer acid (HFPO-DA)	-	µg/kg	<0.34	<0.32	<0.30	<0.27	<0.27	<0.28	<0.29	<0.27	<0.28
Perfluoro-octane sulfonate (PFOS)	3.0	µg/kg	1.2	1.3	0.41 J	<0.72 B*	<0.78 B*	<0.79 B*	<0.59 B*	<0.54	<0.89 B*
Perfluoro-octanoic acid (PFOA)	1.7	µg/kg	<0.28	<0.25	<0.24	<0.22	<0.22	<0.22	<0.23	<0.22	<0.22

µg/kg micrograms per kilogram
\- Cleanup level not established for this analyte.
< Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures.
Bold Concentration exceeds Department of Environmental Conservation (DEC) under-40-inch zone migration-to-groundwater soil cleanup level.
DUP Field-duplicate sample
J Estimated concentration, detected greater than the method detection limit (MDL) and less than the RL. Flag applied by the laboratory.
J* Result considered estimated due to a QC failure. Flag applied by Shannon & Wilson, Inc.

Table 2 - Surface Soil Petroleum Analytical Results

			Sample Name	SS-08	SS-09	SS-10		SS-12	SS-13	SS-14	SS-15	SS-16	SS-17
Analytical Method	Analyte	Cleanup Level	Units	10/29/20	10/29/20	10/29/20	10/29/2020 (DUP)	10/29/20	10/29/20	10/29/20	10/29/20	10/29/20	10/29/20
AK101	Gasoline Range Organics	300	mg/kg	<5.21 B*	<3.28 B*	<4.90 B*	<6.24 B*	<6.59 B*	<3.67 B*	<5.15 B*	<4.75 B*	<4.86 B*	<4.91 B*
AK102	Diesel Range Organics	250	mg/kg	23.7 J	23.3	**303**	**360**	61.8	51.8	56.1	29.5	61.6	31.4
AK103	Residual Range Organics	11,000	mg/kg	304	200	4,350	4,350	966	423	580	95.6 J	779	103 J
SM21 2540G	Total Solids	—	%	83.5	89.2	89.6	89.6	93.5	84.9	87.2	90.3	88.8	90.3
SW8260D	Benzene	0.022	mg/kg	<0.013	<0.0082	<0.012	<0.016	<0.016	<0.0092	<0.013	<0.012	<0.012	<0.012
	Ethylbenzene	0.13	mg/kg	<0.026	<0.016	<0.025	<0.031	<0.033	<0.018	<0.026	<0.024	<0.024	<0.025
	o-Xylene	1.5	mg/kg	<0.026	<0.016	<0.025	<0.031	<0.033	<0.018	<0.026	<0.024	<0.024	<0.025
	P & M -Xylene		mg/kg	<0.052	<0.033	<0.049	<0.063	<0.066	<0.037	<0.052	<0.048	<0.049	<0.049
	Toluene	6.7	mg/kg	<0.026	<0.016	<0.025	<0.031	<0.033	<0.018	<0.026	<0.024	<0.024	<0.025
	Total Xylenes	1.5	mg/kg	<0.078	<0.049	<0.074	<0.094	<0.099	<0.055	<0.078	<0.071	<0.073	<0.074
8270D SIM (PAH)	1-Methylnaphthalene	0.41	mg/kg	—	—	—	—	<0.067	—	—	—	—	—
	2-Methylnaphthalene	1.3	mg/kg	—	—	—	—	<0.067	—	—	—	—	—
	Acenaphthene	37	mg/kg	—	—	—	—	0.039 J	—	—	—	—	—
	Acenaphthylene	18	mg/kg	—	—	—	—	<0.067	—	—	—	—	—
	Anthracene	390	mg/kg	—	—	—	—	0.078 J	—	—	—	—	—
	Benzo(a)anthracene	0.7	mg/kg	—	—	—	—	0.392	—	—	—	—	—
	Benzo(a)pyrene	1.9	mg/kg	—	—	—	—	0.217	—	—	—	—	—
	Benzo(b)fluoranthene	20	mg/kg	—	—	—	—	0.365	—	—	—	—	—
	Benzo(g,h,i)perylene	15,000	mg/kg	—	—	—	—	0.081 J	—	—	—	—	—
	Benzo(k)fluoranthene	190	mg/kg	—	—	—	—	0.117 J	—	—	—	—	—
	Chrysene	600	mg/kg	—	—	—	—	0.421	—	—	—	—	—
	Dibenzo(a,h)anthracene	6.3	mg/kg	—	—	—	—	<0.067	—	—	—	—	—
	Fluoranthene	590	mg/kg	—	—	—	—	0.797	—	—	—	—	—
	Fluorene	36	mg/kg	—	—	—	—	0.040 J	—	—	—	—	—
	Indeno(1,2,3-cd)pyrene	65	mg/kg	—	—	—	—	0.074 J	—	—	—	—	—
	Naphthalene	0.038	mg/kg	—	—	—	—	<0.053	—	—	—	—	—
	Phenanthrene	39	mg/kg	—	—	—	—	0.426	—	—	—	—	—
	Pyrene	87	mg/kg	—	—	—	—	0.650	—	—	—	—	—

mg/kg	milligrams per kilogram
-	Cleanup level not established for this analyte; or analysis not requested.
<	Analyte not detected; listed as less than the limit of quantitation (LOQ) unless otherwise flagged due to quality-control (QC) failures.
Bold	Concentration exceeds Department of Environmental Conservation (DEC) migration-to-groundwater soil cleanup level.
Bold	Concentration exceeds DEC migration-to-groundwater soil cleanup level at a concentration less than the LOQ.
DUP	Field-duplicate sample
J	Estimated concentration, detected greater than the method detection limit (MDL) and less than the RL. Flag applied by the laboratory.
B*	Result is included in the same preparatory batch as a blank detection for the associated analyte. Flag applied by Shannon & Wilson, Inc.

Table 3 - Soil Boring PFAS Analytical Results

Sample Name			10-28-SB1-01	10-28-SB1-02	10-28-SB2-01	10-28-SB2-02	10-28-SB3-01	10-28-SB4-02	10-28-SB5-01	10-28-SB5-02		10-28-SB6-01
Description			Far west end of RW 10-28		West end of RW 10-28		Within RW 10-28	West of junction	East end of RW 10-28			Within RW 10-28
			0 to 1 ft bgs	11.5 to 12.5 ft	0 to 1 ft bgs	6 to 7 ft bgs	0 to 1 ft bgs	9.5 to 10 ft bgs	0 to 1 ft bgs	5 to 6 ft bgs		0 to 1 ft bgs
Analyte	Cleanup Level	Units	10/24/20	10/24/20	10/25/20	10/25/20	10/25/20	10/25/20	10/25/20	10/25/20	10/25/20 (DUP)	10/25/20
Perfluorohexanesulfonic acid (PFHxS)	-	µg/kg	0.041 J	0.34 J	0.13 J	0.032 J	<0.19	<0.38	0.046 J	0.039 J	0.044 J	<0.20
Perfluorohexanoic acid (PFHxA)	-	µg/kg	<0.21	0.16 J	<0.20	<0.20	<0.19	<0.38	<0.21	<0.20	<0.20	<0.20
Perfluoroheptanoic acid (PFHpA)	-	µg/kg	<0.21	<0.35	<0.20	<0.20	<0.19	<0.38	<0.21	<0.20	<0.20	<0.20
Perfluorononanoic acid (PFNA)	-	µg/kg	<0.21	<0.35	<0.20	<0.20	<0.19	<0.38	<0.21	<0.20	<0.20	<0.20
Perfluorobutanesulfonic acid (PFBS)	-	µg/kg	<0.21	<0.35	<0.20	<0.20	<0.19	<0.38	<0.21	<0.20	<0.20	<0.20
Perfluorodecanoic acid (PFDA)	-	µg/kg	<0.21	<0.35	<0.20	<0.20	<0.19	<0.38	0.035 J	<0.20	<0.20	<0.20
Perfluoroundecanoic acid (PFUnA)	-	µg/kg	<0.21	<0.35	<0.20	<0.20	<0.19	<0.38	<0.21	<0.20	<0.20	<0.20
Perfluorododecanoic acid (PFDoA)	-	µg/kg	<0.21	<0.35	<0.20	<0.20	<0.19	<0.38	<0.21	<0.20	<0.20	<0.20
Perfluorotridecanoic acid (PFTrDA)	-	µg/kg	<0.21	<0.35	<0.20	<0.20	<0.19	<0.38	<0.21	<0.20	<0.20	<0.20
Perfluorotetradecanoic acid (PFTeA)	-	µg/kg	<0.21	<0.35	<0.20	<0.20	<0.19	<0.38	<0.21	<0.20	<0.20	<0.20
N-Methyl perfluorooctane sulfonamidoacetic acid (N-	-	µg/kg	<2.1	<3.5	<2.0	<2.0	<1.9	<3.8	<2.1	<2.0	<2.0	<2.0
N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	-	µg/kg	<2.1	<3.5	<2.0	<2.0	<1.9	<3.8	<2.1	<2.0	<2.0	<2.0
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	-	µg/kg	<0.21	<0.35	<0.20	<0.20	<0.19	<0.38	<0.21	<0.20	<0.20	<0.20
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	-	µg/kg	<0.21	<0.35	<0.20	<0.20	<0.19	<0.38	<0.21	<0.20	<0.20	<0.20
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	-	µg/kg	<0.21	<0.35	<0.20	<0.20	<0.19	<0.38	<0.21	<0.20	<0.20	<0.20
Hexafluoropropylene oxide dimer acid (HFPO-DA)	-	µg/kg	<0.26	<0.44	<0.24	<0.25	<0.24	<0.47	<0.26	<0.25	<0.25	<0.25
Perfluoro-octane sulfonate (PFOS)	3.0	µg/kg	1.4	0.93	0.31 J	<0.49	<0.49	<0.94	0.69	<0.49	0.21 J	<0.51
Perfluoro-octanoic acid (PFOA)	1.7	µg/kg	<0.21	<0.35	<0.20	<0.20	<0.19	<0.38	<0.21	<0.20	<0.20	<0.20

µg/kg	micrograms per kilogram
RW	runway
ft	feet
bgs	below the ground surface
-	Cleanup level not established for this analyte.
<	Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures.
Bold	Concentration exceeds Department of Environmental Conservation (DEC) under-40-inch zone migration-to-groundwater soil cleanup level.
DUP	Field-duplicate sample
J	Estimated concentration, detected greater than the method detection limit (MDL) and less than the RL. Flag applied by the laboratory.
J*	Result considered estimated due to a QC failure. Flag applied by Shannon & Wilson, Inc.

Table 3 - Soil Boring PFAS Analytical Results

Sample Name			10-28-SB7-01	10-28-SB7-02		3-21-SB1-01	3-21-SB1-02	3-21-SB2-01	3-21-SB3-01	3-21-SB4-01	3-21-SB4-02
Description			West of junction, north of PAPI shack			Far north end of RW 3-21		Within RW 3-21		Far south end of RW 3-21	
			0 to 1 ft bgs	7.5 to 8.5 ft bgs		0 to 1 ft bgs	6 to 7 ft bgs	0 to 1 ft bgs	0 to 1 ft bgs	0 to 1 ft bgs	5 to 6 ft
Analyte	Cleanup Level	Units	10/26/20	10/26/20	10/26/20 (DUP)	10/23/20	10/23/20	10/23/20	10/23/20	10/24/20	10/24/20
Perfluorohexanesulfonic acid (PFHxS)	-	µg/kg	0.25	<0.26	<0.28	<0.21	<0.22	<0.20	<0.20	0.65	0.050 J
Perfluorohexanoic acid (PFHxA)	-	µg/kg	0.067 J	<0.26	<0.28	<0.21	<0.22	<0.20	<0.20	0.17 J	<0.21
Perfluoroheptanoic acid (PFHpA)	-	µg/kg	<0.21	<0.26	<0.28	<0.21	<0.22	<0.20	<0.20	0.060 J	<0.21
Perfluorononanoic acid (PFNA)	-	µg/kg	<0.21	<0.26	<0.28	<0.21	<0.22	<0.20	<0.20	<0.21	<0.21
Perfluorobutanesulfonic acid (PFBS)	-	µg/kg	<0.21	<0.26	<0.28	<0.21	<0.22	<0.20	<0.20	<0.21	<0.21
Perfluorodecanoic acid (PFDA)	-	µg/kg	<0.21	<0.26	<0.28	<0.21	<0.22	<0.20	<0.20	<0.21	<0.21
Perfluoroundecanoic acid (PFUnA)	-	µg/kg	<0.21	<0.26	<0.28	<0.21	<0.22	<0.20	<0.20	<0.21	<0.21
Perfluorododecanoic acid (PFDoA)	-	µg/kg	<0.21	<0.26	<0.28	<0.21	<0.22	<0.20	<0.20	<0.21	<0.21
Perfluorotridecanoic acid (PFTrDA)	-	µg/kg	<0.21	<0.26	<0.28	<0.21	<0.22	<0.20	<0.20	<0.21	<0.21
Perfluorotetradecanoic acid (PFTeA)	-	µg/kg	<0.21	<0.26	<0.28	<0.21	<0.22	<0.20	<0.20	<0.21	<0.21
N-Methyl perfluorooctane sulfonamidoacetic acid (N-	-	µg/kg	<2.1	<2.6	<2.8	<2.1	<2.2	<2.0	<2.0	<2.1	<2.1
N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	-	µg/kg	<2.1	<2.6	<2.8	<2.1	<2.2	<2.0	<2.0	<2.1	<2.1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	-	µg/kg	<0.21	<0.26	<0.28	<0.21	<0.22	<0.20	<0.20	<0.21	<0.21
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	-	µg/kg	<0.21	<0.26	<0.28	<0.21	<0.22	<0.20	<0.20	<0.21	<0.21
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	-	µg/kg	<0.21	<0.26	<0.28	<0.21	<0.22	<0.20	<0.20	<0.21	<0.21
Hexafluoropropylene oxide dimer acid (HFPO-DA)	-	µg/kg	<0.27	<0.33	<0.35	<0.26	<0.28	<0.26	<0.25	<0.26	<0.26
Perfluoro-octane sulfonate (PFOS)	3.0	µg/kg	<0.54	<0.66	<0.69	<0.52	0.25 J	<0.51	<0.50	0.72	0.54
Perfluoro-octanoic acid (PFOA)	1.7	µg/kg	<0.21	<0.26	<0.28	<0.21	<0.22	<0.20	<0.20	0.12 J	<0.21

µg/kg	micrograms per kilogram
RW	runway
ft	feet
bgs	below the ground surface
-	Cleanup level not established for this analyte.
<	Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures.
Bold	Concentration exceeds Department of Environmental Conservation (DEC) under-40-inch zone migration-to-groundwater soil cleanup level.
DUP	Field-duplicate sample
J	Estimated concentration, detected greater than the method detection limit (MDL) and less than the RL. Flag applied by the laboratory.
J*	Result considered estimated due to a QC failure. Flag applied by Shannon & Wilson, Inc.

Table 3 - Soil Boring PFAS Analytical Results

Sample Name			ANG-SB1-01		ANG-SB1-02	ARFF-SB1-01	ARFF-SB1-02	ARFF-SB1-03	ARFF-SB2-01	ARFF-SB2-02	ARFF-SB2-03
Description			South of National Guard hangar			Southeast corner of ARFF building			Southwest corner of ARFF building		
			0 to 1 ft bgs		9 to 10 ft bgs	0 to 1 ft bgs	5 to 6 ft bgs	10 to 11 ft bgs	0 to 1 ft bgs	5 to 6 ft bgs	9 to 10 ft bgs
Analyte	Cleanup Level	Units	10/23/20	10/23/20 (DUP)	10/23/20	10/24/20	10/24/20	10/24/20	10/24/20	10/24/20	10/24/20
Perfluorohexanesulfonic acid (PFHxS)	-	µg/kg	0.11 J	<0.21	<0.21	0.033 J	0.056 J	<0.21	0.45	0.043 J	<0.23
Perfluorohexanoic acid (PFHxA)	-	µg/kg	0.10 J	<0.21	<0.21	0.059 J	<0.20	<0.21	<0.19	0.059 J	<0.23
Perfluoroheptanoic acid (PFHpA)	-	µg/kg	0.041 J	<0.21	<0.21	<0.20	<0.20	<0.21	<0.19	<0.21	<0.23
Perfluorononanoic acid (PFNA)	-	µg/kg	<0.23	<0.21	<0.21	<0.20	<0.20	<0.21	<0.19	<0.21	<0.23
Perfluorobutanesulfonic acid (PFBS)	-	µg/kg	<0.23	<0.21	<0.21	<0.20	<0.20	<0.21	<0.19	0.048 J	<0.23
Perfluorodecanoic acid (PFDA)	-	µg/kg	<0.23	<0.21	<0.21	<0.20	<0.20	<0.21	<0.19	<0.21	<0.23
Perfluoroundecanoic acid (PFUnA)	-	µg/kg	<0.23	<0.21	<0.21	<0.20	<0.20	<0.21	<0.19	<0.21	<0.23
Perfluorododecanoic acid (PFDoA)	-	µg/kg	<0.23	<0.21	<0.21	<0.20	<0.20	<0.21	<0.19	<0.21	<0.23
Perfluorotridecanoic acid (PFTrDA)	-	µg/kg	<0.23	<0.21	<0.21	<0.20	<0.20	<0.21	<0.19	<0.21	<0.23
Perfluorotetradecanoic acid (PFTeA)	-	µg/kg	<0.23	<0.21	<0.21	<0.20	<0.20	<0.21	<0.19	<0.21	<0.23
N-Methyl perfluorooctane sulfonamidoacetic acid (N-	-	µg/kg	<2.3	<2.1	<2.1	<2.0	<2.0	<2.1	<1.9	<2.1	<2.3
N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	-	µg/kg	<2.3	<2.1	<2.1	<2.0	<2.0	<2.1	<1.9	<2.1	<2.3
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	-	µg/kg	<0.23	<0.21	<0.21	<0.20	<0.20	<0.21	<0.19	<0.21	<0.23
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	-	µg/kg	<0.23	<0.21	<0.21	<0.20	<0.20	<0.21	<0.19	<0.21	<0.23
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	-	µg/kg	<0.23	<0.21	<0.21	<0.20	<0.20	<0.21	<0.19	<0.21	<0.23
Hexafluoropropylene oxide dimer acid (HFPO-DA)	-	µg/kg	<0.28	<0.26	<0.26	<0.25	<0.26	<0.26	<0.24	<0.27	<0.29
Perfluoro-octane sulfonate (PFOS)	3.0	µg/kg	0.27 J	0.29 J	<0.53	0.24 J	<0.51	<0.53	**3.3**	0.35 J	<0.58
Perfluoro-octanoic acid (PFOA)	1.7	µg/kg	<0.23	<0.21	<0.21	<0.20	<0.20	<0.21	<0.19	<0.21	<0.23

µg/kg	micrograms per kilogram
RW	runway
ft	feet
bgs	below the ground surface
-	Cleanup level not established for this analyte.
<	Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures.
Bold	Concentration exceeds Department of Environmental Conservation (DEC) under-40-inch zone migration-to-groundwater soil cleanup level.
DUP	Field-duplicate sample
J	Estimated concentration, detected greater than the method detection limit (MDL) and less than the RL. Flag applied by the laboratory.
J*	Result considered estimated due to a QC failure. Flag applied by Shannon & Wilson, Inc.

Table 3 - Soil Boring PFAS Analytical Results

Sample Name			ARFF-SB3-01	ARFF-SB3-02	ARFF-SB3-03		ARFF-SB4-01	ARFF-SB4-02	ARFF-SB4-03	AKA-SB1-01	AKA-SB1-02	
Description			South of wind sock (MW01-30)				North of ARFF building (MW02-15)			Northeast corner of Alaska Airlines building		
			0 to 1 ft bgs	5 to 6 ft bgs	8.5 to 10 ft bgs		0 to 1 ft bgs	5 to 6 ft bgs	8 to 9 ft bgs	0 to 1 ft bgs	6 to 7 ft bgs	
Analyte	Cleanup Level	Units	10/26/20	10/26/20	10/26/20	10/26/20 (DUP)	10/26/20	10/26/20	10/26/20	10/27/20	10/27/20	10/27/20 (DUP)
Perfluorohexanesulfonic acid (PFHxS)	-	µg/kg	0.36	0.63	0.10 J	0.091 J	0.098 J	0.33	0.35	0.12 J	0.44	0.36
Perfluorohexanoic acid (PFHxA)	-	µg/kg	0.068 J	<0.22	<0.24	<0.22	0.049 J	0.073 J	0.11 J	0.088 J*	0.64	0.72
Perfluoroheptanoic acid (PFHpA)	-	µg/kg	0.030 J	0.035 J	<0.24	<0.22	<0.20	<0.21	<0.21	0.063 J	0.60	0.51
Perfluorononanoic acid (PFNA)	-	µg/kg	0.055 J	<0.22	<0.24	<0.22	<0.20	<0.21	<0.21	0.097 J	0.068 J	0.056 J
Perfluorobutanesulfonic acid (PFBS)	-	µg/kg	<0.20	<0.22	<0.24	<0.22	<0.20	<0.21	<0.21	<0.20	<0.22	<0.20
Perfluorodecanoic acid (PFDA)	-	µg/kg	0.15 J	<0.22	<0.24	<0.22	<0.20	<0.21	<0.21	0.22	<0.22	<0.20
Perfluoroundecanoic acid (PFUnA)	-	µg/kg	<0.20	<0.22	<0.24	<0.22	<0.20	<0.21	<0.21	0.13 J	<0.22	<0.20
Perfluorododecanoic acid (PFDoA)	-	µg/kg	<0.20	<0.22	<0.24	<0.22	<0.20	<0.21	<0.21	0.17 J	<0.22	<0.20
Perfluorotridecanoic acid (PFTrDA)	-	µg/kg	<0.20	<0.22	<0.24	<0.22	<0.20	<0.21	<0.21	<0.20	<0.22	<0.20
Perfluorotetradecanoic acid (PFTeA)	-	µg/kg	<0.20	<0.22	<0.24	<0.22	<0.20	<0.21	<0.21	<0.20	<0.22	<0.20
N-Methyl perfluorooctane sulfonamidoacetic acid (N-	-	µg/kg	<2.0	<2.2	<2.4	<2.2	<2.0	<2.1	<2.1	<2.0	<2.2	<2.0
N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	-	µg/kg	<2.0	<2.2	<2.4	<2.2	<2.0	<2.1	<2.1	<2.0	<2.2	<2.0
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	-	µg/kg	<0.20	<0.22	<0.24	<0.22	<0.20	<0.21	<0.21	<0.20	<0.22	<0.20
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	-	µg/kg	<0.20	<0.22	<0.24	<0.22	<0.20	<0.21	<0.21	<0.20	<0.22	<0.20
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	-	µg/kg	<0.20	<0.22	<0.24	<0.22	<0.20	<0.21	<0.21	<0.20	<0.22	<0.20
Hexafluoropropylene oxide dimer acid (HFPO-DA)	-	µg/kg	<0.25	<0.28	<0.30	<0.28	<0.24	<0.27	<0.26	<0.25	<0.27	<0.26
Perfluoro-octane sulfonate (PFOS)	3.0	µg/kg	**3.7**	0.28 J	0.49 J	0.44 J	0.66	0.24 J	<0.53	**5.8**	**22 J***	**20 J***
Perfluoro-octanoic acid (PFOA)	1.7	µg/kg	<0.20	<0.22	<0.24	<0.22	0.084 J	<0.21	<0.21	0.16 J	0.89	0.56

µg/kg	micrograms per kilogram
RW	runway
ft	feet
bgs	below the ground surface
-	Cleanup level not established for this analyte.
<	Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures.
Bold	Concentration exceeds Department of Environmental Conservation (DEC) under-40-inch zone migration-to-groundwater soil cleanup level.
DUP	Field-duplicate sample
J	Estimated concentration, detected greater than the method detection limit (MDL) and less than the RL. Flag applied by the laboratory.
J*	Result considered estimated due to a QC failure. Flag applied by Shannon & Wilson, Inc.

Table 4 - Soil Boring Petroleum Analytical Results

			Sample Name	*10-28-SB4-03*	*ARFF-SB1-03*	*ARFF-SB2-03*	*ARFF-SB3-03*		*ARFF-SB4-03*
			Description	West of junction	SE corner ARFF bldg	SW corner ARFF bldg	S of windsock (MW01-30)		N of ARFF bldg (MW02-15)
				11.5 to 12.5 ft	10 to 11 ft bgs	9 to 10 ft bgs	8.5 to 10 ft bgs		8 to 9 ft bgs
Analytical Method	**Analyte**	**Cleanup Level**	**Units**	10/25/2020	10/24/2020	10/24/2020	10/26/2020	10/26/20 (DUP)	10/26/2020
AK101	Gasoline Range Organics (GRO)	300	mg/kg	<6.34 B*	<3.54 B*	<5.00 B*	<5.16 B*	<4.87 B*	<3.75 B*
AK102	Diesel Range Organics (DRO)	250	mg/kg	23.1 J	14.8 J	19.7 J	14.1 J	14.1 J	11.9 J
AK103	Residual Range Organics (RRO)	11,000	mg/kg	250	<55	112 J	<60	<60	<55
SM21 2540G	Total Solids	—	%	82.2	91.0	84.0	82.1	82.3	89.3
SW8260D	Benzene	0.022	mg/kg	<0.016	<0.0089	<0.013	<0.013	<0.012	<0.0094
	Ethylbenzene	0.13	mg/kg	<0.032	<0.018	<0.025	<0.026	<0.024	<0.019
	o-Xylene	1.5	mg/kg	<0.032	<0.018	<0.025	<0.026	<0.024	<0.019
	P & M -Xylene		mg/kg	<0.064	<0.036	<0.050	<0.052	<0.049	<0.038
	Toluene	6.7	mg/kg	<0.032	<0.018	<0.025	<0.026	<0.024	<0.019
	Total Xylenes	1.5	mg/kg	<0.095	<0.053	<0.075	<0.078	<0.073	<0.057
8270D SIM (PAH)	1-Methylnaphthalene	0.41	mg/kg	—	—	—	<0.015	<0.015	—
	2-Methylnaphthalene	1.3	mg/kg	—	—	—	<0.015	<0.015	—
	Acenaphthene	37	mg/kg	—	—	—	<0.015	<0.015	—
	Acenaphthylene	18	mg/kg	—	—	—	<0.015	<0.015	—
	Anthracene	390	mg/kg	—	—	—	<0.015	<0.015	—
	Benzo(a)anthracene	0.7	mg/kg	—	—	—	<0.015	<0.015	—
	Benzo(a)pyrene	1.9	mg/kg	—	—	—	<0.015	<0.015	—
	Benzo(b)fluoranthene	20	mg/kg	—	—	—	<0.015	<0.015	—
	Benzo(g,h,i)perylene	15,000	mg/kg	—	—	—	<0.015	<0.015	—
	Benzo(k)fluoranthene	190	mg/kg	—	—	—	<0.015	<0.015	—
	Chrysene	600	mg/kg	—	—	—	<0.015	<0.015	—
	Dibenzo(a,h)anthracene	6.3	mg/kg	—	—	—	<0.015	<0.015	—
	Fluoranthene	590	mg/kg	—	—	—	<0.015	<0.015	—
	Fluorene	36	mg/kg	—	—	—	<0.015	<0.015	—
	Indeno(1,2,3-cd)pyrene	65	mg/kg	—	—	—	<0.015	<0.015	—
	Naphthalene	0.038	mg/kg	—	—	—	<0.012	<0.012	—
	Phenanthrene	39	mg/kg	—	—	—	<0.015	<0.015	—
	Pyrene	87	mg/kg	—	—	—	<0.015	<0.015	—

mg/kg milligrams per kilogram
\- Cleanup level not established for this analyte; or analysis not requested.
< Analyte not detected; listed as less than the limit of quantitation (LOQ) unless otherwise flagged due to quality-control (QC) failures.
DUP Field-duplicate sample
J Estimated concentration, detected greater than the method detection limit (MDL) and less than the RL. Flag applied by the laboratory.
B* Result is included in the same preparatory batch as a blank detection for the associated analyte. Flag applied by Shannon & Wilson, Inc.

Table 5 - Sediment Analytical Results

	Sample Name		SD-01	SD-02		SD-04	SD-06	SD-08	SD-09	SD-10		SD-12	SD-13
Analyte	Cleanup Level	Units	10/20/20	10/20/20	10/20/20 (DUP)	10/20/20	10/22/20	10/22/20	10/22/20	10/22/20	10/22/20 (DUP)	10/22/20	10/22/20
Perfluorohexanesulfonic acid (PFHxS)	-	µg/kg	0.061 J*	<0.24	<0.33	<0.28	0.19 J	0.15 J	<0.26	0.10 J	0.11 J	<0.35	<2.2 J*
Perfluorohexanoic acid (PFHxA)	-	µg/kg	<0.22	<0.24	<0.33	<0.28	0.058 J	0.14 J	<0.26	<0.26	<0.30	<0.35	0.24
Perfluoroheptanoic acid (PFHpA)	-	µg/kg	<0.22	<0.24	<0.33	<0.28	<0.22	0.089 J	<0.26	<0.26	<0.30	<0.35	0.079 J
Perfluorononanoic acid (PFNA)	-	µg/kg	<0.22	<0.24	<0.33	<0.28	<0.22	0.10 J	<0.26	0.057 J	0.076 J	<0.35	0.14 J
Perfluorobutanesulfonic acid (PFBS)	-	µg/kg	<0.22	<0.24	<0.33	<0.28	<0.22	<0.45	<0.26	<0.26	<0.30	<0.35	0.036 J
Perfluorodecanoic acid (PFDA)	-	µg/kg	<0.22	<0.24	<0.33	<0.28	<0.22	0.13 J	<0.26	<0.26	<0.30	<0.35	0.63
Perfluoroundecanoic acid (PFUnA)	-	µg/kg	<0.22	<0.24	<0.33	<0.28	<0.22	0.16 J	<0.26	<0.26	<0.30	<0.35	0.26 JH*
Perfluorododecanoic acid (PFDoA)	-	µg/kg	<0.22	<0.24	<0.33	<0.28	<0.22	<0.45	<0.26	<0.26	<0.30	<0.35	0.32
Perfluorotridecanoic acid (PFTrDA)	-	µg/kg	<0.22	<0.24	<0.33	<0.28	<0.22	<0.45	<0.26	<0.26	<0.30	<0.35	<0.23
Perfluorotetradecanoic acid (PFTeA)	-	µg/kg	<0.22	<0.24	<0.33	<0.28	<0.22	<0.45	<0.26	<0.26	<0.30	<0.35	<0.23
N-Methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	-	µg/kg	<2.2	<2.4	<3.3	<2.8	<2.2	<4.5	<2.6	<2.6	<3.0	<3.5	<2.3
N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	-	µg/kg	<2.2	<2.4	<3.3	<2.8	<2.2	<4.5	<2.6	<2.6	<3.0	<3.5	<2.3
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	-	µg/kg	<0.22	<0.24	<0.33	<0.28	<0.22	<0.45	<0.26	<0.26	<0.30	<0.35	<0.23
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	-	µg/kg	<0.22	<0.24	<0.33	<0.28	<0.22	<0.45	<0.26	<0.26	<0.30	<0.35	<0.23
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	-	µg/kg	<0.22 J*	<0.24 J*	<0.33 J*	<0.28 J*	<0.22 J*	<0.45 J*	<0.26 J*	<0.26 J*	<0.30 J*	<0.35 J*	<0.23 J*
Hexafluoropropylene oxide dimer acid (HFPO-DA)	-	µg/kg	<0.27	<0.30	<0.41	<0.35	<0.27	<0.56	<0.33	<0.33	<0.38	<0.43	<0.29
Perfluorooctanesulfonic acid (PFOS)	3.0	µg/kg	<0.57 B*	<0.59 B*	<0.83 B*	<0.65 B*	<0.78 B*	<1.5 B*	<0.67 B*	<0.75 B*	<1.1 B*	<0.82 B*	2.8 J*
Perfluorooctanoic acid (PFOA)	1.7	µg/kg	<0.22	<0.24	<0.33	<0.28	<0.22	<0.45	<0.26	<0.26	<0.30	<0.35	0.15 J

µg/kg	micrograms per kilogram
-	Cleanup level not established for this analyte.
<	Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures.
DUP	Field-duplicate sample
J	Estimated concentration, detected greater than the method detection limit (MDL) and less than the RL. Flag applied by the laboratory.
J*	Result considered estimated due to a QC failure. Flag applied by Shannon & Wilson, Inc.
JH*	Result considered estimated, biased high due to a QC failure. Flag applied by Shannon & Wilson, Inc.
B*	Result is included in the same preparatory batch as a blank detection for the associated analyte. Flag applied by Shannon & Wilson, Inc.

Table 6 - Water Supply Well Analytical Results

		Sample Name	*PW-181*
		Description	
		Well Category	4
Analyte	EPA LHA	Units	10/28/20
Perfluoro-hexane sulfonic acid (PFHxS)	-	ppt	6.2
Perfluorohexanoic acid (PFHxA)	-	ppt	4.0
Perfluoro-heptanoic acid (PFHpA)	-	ppt	1.6 J
Perfluoro-nonanoic acid (PFNA)	-	ppt	<2.0
Perluoro-butane sulfonic acid (PFBS)	-	ppt	1.0 J
Perfluorodecanoic acid (PFDA)	-	ppt	<2.0
Perfluoroundecanoic acid (PFUnA)	-	ppt	<2.0
Perfluoro-dodecanoic acid (PFDoA)	-	ppt	<2.0
Perfluorotridecanoic acid (PFTrDA)	-	ppt	<2.0
Perfluoro-tetradecanoic acid (PFTeA)	-	ppt	<2.0
N-Methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	-	ppt	<2.0
N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	-	ppt	<2.0
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	-	ppt	<2.0
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	-	ppt	<2.0
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	-	ppt	<2.0
Hexafluoropropylene oxide dimer acid (HFPO-DA)	-	ppt	<2.0
Perfluorooctanesulfonic acid (PFOS)	70†	ppt	6.3
Perfluorooctanoic acid (PFOA)		ppt	1.8 J
LHA Combined (PFOS + PFOA)	70†	ppt	8.1 J

ppt parts per trillion, equivalent to nanograms per liter
EPA Environmental Protection Agency
LHA Lifetime Health Advisory
† EPA LHA level is 70 ppt for PFOS and PFOA combined.
< Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures.
J Estimated concentration, detected greater than the method detection limit (MDL) and less than the RL. Flag applied by the laboratory.

Table 7 - Surface Water Analytical Results

		Sample Name	*SW-1*	*SW-02*		*SW-04*	*SW-05*
Analyte	Cleanup Level	Units	10/20/20	10/20/2020	10/20/20 (DUP)	10/20/20	10/20/20
Perfluorohexanesulfonic acid (PFHxS)	-	ng/L	13	2.3	2.4	0.54 J	8.4
Perfluorohexanoic acid (PFHxA)	-	ng/L	6.3	2.3	2.2	<1.9	5.1
Perfluoroheptanoic acid (PFHpA)	-	ng/L	2.5	1.3 J	1.3 J	1.2 J	2.1
Perfluorononanoic acid (PFNA)	-	ng/L	<1.7	<1.8	<1.9	<1.9	<1.7
Perfluorobutanesulfonic acid (PFBS)	-	ng/L	1.9	0.41 J	0.50 J	<1.9	1.3 J
Perfluorodecanoic acid (PFDA)	-	ng/L	<1.7	<1.8	<1.9	<1.9	<1.7
Perfluoroundecanoic acid (PFUnA)	-	ng/L	<1.7	<1.8	<1.9	<1.9	<1.7
Perfluorododecanoic acid (PFDoA)	-	ng/L	<1.7	<1.8	<1.9	<1.9	<1.7
Perfluorotridecanoic acid (PFTrDA)	-	ng/L	<1.7	<1.8	<1.9	<1.9	<1.7
Perfluorotetradecanoic acid (PFTeA)	-	ng/L	<1.7	<1.8	<1.9	<1.9	<1.7
N-Methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	-	ng/L	<4.4	<4.5	<4.8	<4.6	<4.3
N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	-	ng/L	<4.4	<4.5	<4.8	<4.6	<4.3
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	-	ng/L	<1.7	<1.8	<1.9	<1.9	<1.7
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	-	ng/L	<1.7	<1.8	<1.9	<1.9	<1.7
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	-	ng/L	<1.7	<1.8	<1.9	<1.9	<1.7
Hexafluoropropylene oxide dimer acid (HFPO-DA)	-	ng/L	<3.5	<3.6	<3.9	<3.7	<3.5
Perfluorooctanesulfonic acid (PFOS)	400	ng/L	8.7	5.0	5.6	1.2 J	17
Perfluorooctanoic acid (PFOA)	400	ng/L	1.7	0.92 J	0.90 J	<1.9	2.2

ng/L nanograms per liter, equivalent to parts per trillion

\- Cleanup level not established.

< Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures.

DUP Field-duplicate sample

J Estimated concentration, detected greater than the method detection limit (MDL) and less than the RL. Flag applied by the laboratory.

Table 7 - Surface Water Analytical Results

		Sample Name	*SW-06*	*SW-07*	*SW-08*	*SW-09*
Analyte	Cleanup Level	Units	10/22/20	10/22/20	10/22/20	10/22/20
Perfluorohexanesulfonic acid (PFHxS)	-	ng/L	13	9.8	14	13
Perfluorohexanoic acid (PFHxA)	-	ng/L	13	7.2	11	12
Perfluoroheptanoic acid (PFHpA)	-	ng/L	5.3	2.5	3.5	4.0
Perfluorononanoic acid (PFNA)	-	ng/L	<1.8	<1.9	<1.9	<1.9
Perfluorobutanesulfonic acid (PFBS)	-	ng/L	1.7 J	1.6 J	3.0	3.0
Perfluorodecanoic acid (PFDA)	-	ng/L	<1.8	<1.9	<1.9	<1.9
Perfluoroundecanoic acid (PFUnA)	-	ng/L	<1.8	<1.9	<1.9	<1.9
Perfluorododecanoic acid (PFDoA)	-	ng/L	<1.8	<1.9	<1.9	<1.9
Perfluorotridecanoic acid (PFTrDA)	-	ng/L	<1.8	<1.9	<1.9	<1.9
Perfluorotetradecanoic acid (PFTeA)	-	ng/L	<1.8	<1.9	<1.9	<1.9
N-Methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	-	ng/L	<4.6	<4.8	<4.7	<4.7
N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	-	ng/L	<4.6	<4.8	<4.7	<4.7
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	-	ng/L	<1.8	<1.9	<1.9	<1.9
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	-	ng/L	<1.8	<1.9	<1.9	<1.9
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	-	ng/L	<1.8	<1.9	<1.9	<1.9
Hexafluoropropylene oxide dimer acid (HFPO-DA)	-	ng/L	<3.7	<3.8	<3.8	<3.7
Perfluorooctanesulfonic acid (PFOS)	400	ng/L	41	15	8.2	9.4
Perfluorooctanoic acid (PFOA)	400	ng/L	3.7	2.0	1.7 J	2.2

ng/L nanograms per liter, equivalent to parts per trillion

\- Cleanup level not established.

< Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due

DUP Field-duplicate sample

J Estimated concentration, detected greater than the method detection limit (MDL) and less tha

Table 7 - Surface Water Analytical Results

	Sample Name		*SW-10*		*SW-12*	*SW-13*
Analyte	Cleanup Level	Units	10/22/20	10/22/20 (DUP)	10/22/20	10/22/20
Perfluorohexanesulfonic acid (PFHxS)	-	ng/L	6.3	6.6	9.8	13
Perfluorohexanoic acid (PFHxA)	-	ng/L	3.9	3.7	4.3	33
Perfluoroheptanoic acid (PFHpA)	-	ng/L	1.8 J	1.6 J	1.9 J	7.0
Perfluorononanoic acid (PFNA)	-	ng/L	<1.9	<1.8	<2.0	3.3
Perfluorobutanesulfonic acid (PFBS)	-	ng/L	1.0 J	1.2 J	1.7 J	2.5
Perfluorodecanoic acid (PFDA)	-	ng/L	<1.9	<1.8	<2.0	3.1
Perfluoroundecanoic acid (PFUnA)	-	ng/L	<1.9	<1.8	<2.0	<2.0
Perfluorododecanoic acid (PFDoA)	-	ng/L	<1.9	<1.8	<2.0	<2.0
Perfluorotridecanoic acid (PFTrDA)	-	ng/L	<1.9	<1.8	<2.0	<2.0
Perfluorotetradecanoic acid (PFTeA)	-	ng/L	<1.9	<1.8	<2.0	<2.0
N-Methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	-	ng/L	<4.7	<4.6	<5.0	<5.0
N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	-	ng/L	<4.7	<4.6	<5.0	<5.0
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	-	ng/L	<1.9	<1.8	<2.0	<2.0
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	-	ng/L	<1.9	<1.8	<2.0	<2.0
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	-	ng/L	<1.9	<1.8	<2.0	<2.0
Hexafluoropropylene oxide dimer acid (HFPO-DA)	-	ng/L	<3.8	<3.7	<4.0	<4.0
Perfluorooctanesulfonic acid (PFOS)	400	ng/L	17	18	18	150
Perfluorooctanoic acid (PFOA)	400	ng/L	1.4 J	1.2 J	1.4 J	9.3

ng/L nanograms per liter, equivalent to parts per trillion
- Cleanup level not established.
< Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due
DUP Field-duplicate sample
J Estimated concentration, detected greater than the method detection limit (MDL) and less tha

Table 8 - Groundwater and Post-Filtration PFAS Analytical Results

		Sample Name	10-28-TWP-02	10-28-TWP-05		10-28-TWP-07		3-21-TWP-01	3-21-TWP-04		AKA-TWP-01	ANG-TWP-01	
		Description	West end of RW 10-28	East end of RW 10-28		West of junction, north of PAPI shack		Far north end of RW 3-21	Far south end of RW 3-21		NE corner of Alaska Airlines	South of National Guard hangar	
Analyte	Cleanup Level	Units	10/25/20	10/25/20	10/25/20 (DUP)	10/26/20	10/26/20 (DUP)	10/26/20	10/24/20	10/24/20 (DUP)	10/31/20	10/27/20	10/27/20 (DUP)
Perfluoro-hexane sulfonic acid (PFHxS)	-	ng/L	2.5	330	330	4.5	4.3	12	26	27	1,300	32	33
Perfluorohexanoic acid (PFHxA)	-	ng/L	2.4	160	170	8.2	8.3	9.6	19	19	6,500	100	100
Perfluoro-heptanoic acid (PFHpA)	-	ng/L	0.75 J	52	51	2.1	2.1	3.6	11	10	2,000	12	11
Perfluoro-nonanoic acid (PFNA)	-	ng/L	<1.9	0.74 J	0.85 J	<1.9	<1.8	0.42 J	1.7 J	1.8 J	8.3	0.52 J	0.44 J
Perluoro-butane sulfonic acid (PFBS)	-	ng/L	0.31 J	42	43	0.82 J	0.81 J	1.5 J	3.3	3.3	57	12	12
Perfluorodecanoic acid (PFDA)	-	ng/L	<1.9	<1.9	<2.1	<1.9	<1.8	<2.0	1.1 J	1.1 J	0.43 J	<1.9	<1.8
Perfluoroundecanoic acid (PFUnA)	-	ng/L	<1.9	<1.9	<2.1	<1.9	<1.8	<2.0	<1.9	<1.9	<1.9	<1.9	<1.8
Perfluoro-dodecanoic acid (PFDoA)	-	ng/L	<1.9	<1.9	<2.1	<1.9	<1.8	<2.0	<1.9	<1.9	<1.9	<1.9	<1.8
Perfluorotridecanoic acid (PFTrDA)	-	ng/L	<1.9	<1.9	<2.1	<1.9	<1.8	<2.0	<1.9	<1.9	<1.9	<1.9	<1.8
Perfluoro-tetradecanoic acid (PFTeA)	-	ng/L	<1.9	<1.9	<2.1	<1.9	<1.8	<2.0	<1.9	<1.9	<1.9 J*	<1.9 J*	<1.8 J*
N-Methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	-	ng/L	<4.8	<4.7	<5.2	<4.7	<4.6	<4.9	<4.7	<4.7	<4.8	<4.8	<4.6
N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	-	ng/L	<4.8	<4.7	<5.2	<4.7	<4.6	<4.9	<4.7	<4.7	<4.8	<4.8	<4.6
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	-	ng/L	<1.9	<1.9	<2.1	<1.9	<1.8	<2.0	<1.9	<1.9	<1.9	<1.9	<1.8
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	-	ng/L	<1.9	<1.9	<2.1	<1.9	<1.8	<2.0	<1.9	<1.9	<1.9	<1.9	<1.8
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	-	ng/L	<1.9	<1.9	<2.1	<1.9	<1.8	<2.0	<1.9	<1.9	<1.9	<1.9	<1.8
Hexafluoropropylene oxide dimer acid (HFPO-DA)	-	ng/L	<3.9	<3.8	<4.1	<3.8	<3.7	<4.0	<3.7	<3.7	<3.8	<3.8	<3.6
Perfluorooctanesulfonic acid (PFOS)	400	ng/L	<2.0 J*	99 J*	98 J*	<1.9 J*	<1.8 J*	11 B	72 B	71 B	**2,900**	27	26
Perfluorooctanoic acid (PFOA)	400	ng/L	<1.9	43	40	0.84 J	0.88 J	3.3	11	12	**760**	4.6	4.4

ng/L	nanograms per liter, equivalent to parts per trillion
ARFF	aircraft rescue and firefighting
MW	monitoring well
NE	northeast
NW	northwest
RW	runway
-	Cleanup level not established.
<	Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures.
Bold	Concentration exceeds DEC groundwater-cleanup levels reported in 18 AAC 75, Table C.
DUP	Field-duplicate sample
J	Estimated concentration, detected greater than the method detection limit (MDL) and less than the RL. Flag applied by the laboratory.
B	Compound was found in the blank and sample. Flag applied by the laboratory.
J*	Result considered estimated due to a QC failure. Flag applied by Shannon & Wilson, Inc.

Table 8 - Groundwater and Post-Filtration PFAS Analytical Results

		Sample Name	GP-TWP-01	LNDFL-TWP-01	MW-5		MW-D5-01	OME-MW01-15	OME-MW01-30	OME-MW02-15		GAC-POST
		Description	Gravel pit NW of airport	Monofill north of airport	Existing MW on Southeast Apron		Existing MW at Dredge 5	New 15 ft MW south of ARFF	New 30ft MW south of ARFF	New 15ft MW northwest of ARFF		Post-filtration water sample
Analyte	Cleanup Level	Units	10/27/20	10/26/20	10/28/20	10/28/20 (DUP)	10/28/20	10/31/20	10/31/20	10/31/20	10/31/20 (DUP)	11/1/20
Perfluoro-hexane sulfonic acid (PFHxS)	-	ng/L	0.98 J	19	15	14	1.3 J	80	32	190	180	1.6 J
Perfluorohexanoic acid (PFHxA)	-	ng/L	1.1 J	17	10	12	3.3	65	29	260	270	1.0 J
Perfluoro-heptanoic acid (PFHpA)	-	ng/L	1.4 J	4.9	4.6	4.7	3.0	15	5.9	54	49	0.49 J
Perfluoro-nonanoic acid (PFNA)	-	ng/L	0.88 J	<2.0	0.51 J	0.45 J	0.70 J	<1.7	<1.7	1.5 J	1.5 J	<1.9
Perluoro-butane sulfonic acid (PFBS)	-	ng/L	<1.9	4.5	2.0	2.1	0.22 J	21	5.3	19	18	<1.9
Perfluorodecanoic acid (PFDA)	-	ng/L	<1.9	<2.0	<1.7	<1.7	<2.0	<1.7	<1.7	<1.9	<1.8	<1.9
Perfluoroundecanoic acid (PFUnA)	-	ng/L	<1.9	<2.0	<1.7	<1.7	<2.0	<1.7	<1.7	<1.9	<1.8	<1.9
Perfluoro-dodecanoic acid (PFDoA)	-	ng/L	<1.9	<2.0	<1.7	<1.7	<2.0	<1.7	<1.7	<1.9	<1.8	<1.9
Perfluorotridecanoic acid (PFTrDA)	-	ng/L	<1.9	<2.0	<1.7	<1.7	<2.0	<1.7	<1.7	<1.9	<1.8	<1.9
Perfluoro-tetradecanoic acid (PFTeA)	-	ng/L	<1.9 J*	<2.0	<1.7 J*	<1.7 J*	<2.0 J*	<1.7 J*	<1.7 J*	<1.9 J*	<1.8 J*	<1.9 J*
N-Methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	-	ng/L	<4.8	<5.0	<4.3	<4.3	<4.9	<4.3	<4.2	<4.9	<4.6	<4.6
N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	-	ng/L	<4.8	<5.0	<4.3	<4.3	<4.9	<4.3	<4.2	<4.9	<4.6	<4.6
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	-	ng/L	<1.9	<2.0	<1.7	<1.7	<2.0	<1.7	<1.7	<1.9	<1.8	<1.9
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	-	ng/L	<1.9	<2.0	<1.7	<1.7	<2.0	<1.7	<1.7	<1.9	<1.8	<1.9
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	-	ng/L	<1.9	<2.0	<1.7	<1.7	<2.0	<1.7	<1.7	<1.9	<1.8	<1.9
Hexafluoropropylene oxide dimer acid (HFPO-DA)	-	ng/L	<3.8	<4.0	<3.4	<3.4	<3.9	<3.5	<3.4	<3.9	<3.7	<3.7
Perfluorooctanesulfonic acid (PFOS)	400	ng/L	1.7 J	6.6 B	20	15	1.8 J	53	65	91	86	2.3
Perfluorooctanoic acid (PFOA)	400	ng/L	<1.9	3.6	6.2	6.7	4.0	8.0	4.8	54	55	<1.9

ng/L	nanograms per liter, equivalent to parts per trillion
ARFF	aircraft rescue and firefighting
MW	monitoring well
NE	northeast
NW	northwest
RW	runway
-	Cleanup level not established.
<	Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures.
Bold	Concentration exceeds DEC groundwater-cleanup levels reported in 18 AAC 75, Table C.
DUP	Field-duplicate sample
J	Estimated concentration, detected greater than the method detection limit (MDL) and less than the RL. Flag applied by the laboratory.
B	Compound was found in the blank and sample. Flag applied by the laboratory.
J*	Result considered estimated due to a QC failure. Flag applied by Shannon & Wilson, Inc.

Table 9 - Groundwater Petroleum Analytical Results

			Sample Name	ANG-TWP-01		OME-MW01-15	OME-MW02-15	
Analytical Method	Analyte	Cleanup Level	Units	10/27/20	10/27/20	10/31/20	10/31/20	10/31/20 (DUP)
AK101	Gasoline Range Organics (GRO)	2.2	mg/L	<0.100 B*	<0.100 B*	<0.100 B*	<0.050	<0.050
AK102	Diesel Range Organics (DRO)	1.5	mg/L	**2.96**	**2.70**	<0.578 B*	<0.577 B*	<0.577 B*
AK103	Residual Range Organics (RRO)	1.1	mg/L	0.865	0.702	<1.00 B*	<0.481 B*	<0.535 B*
SW8260D	Benzene	4.6	µg/L	0.71	0.69	0.69	<0.20	<0.20
	Ethylbenzene	15	µg/L	0.48 J	0.48 J	<0.50	<0.50	<0.50
	o-Xylene	190	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
	P & M -Xylene		µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
	Toluene	1,100	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50
	Total Xylenes	190	µg/L	<1.5	<1.5	<1.5	<1.5	<1.5
8270D SIM LV (PAH)	1-Methylnaphthalene	11	µg/L	—	—	—	<0.024	<0.024
	2-Methylnaphthalene	36	µg/L	—	—	—	<0.024	<0.024
	Acenaphthene	530	µg/L	—	—	—	<0.024	<0.024
	Acenaphthylene	260	µg/L	—	—	—	<0.024	<0.024
	Anthracene	43	µg/L	—	—	—	<0.024	<0.024
	Benzo(a)anthracene	0.3	µg/L	—	—	—	<0.024	<0.024
	Benzo(a)pyrene	0.25	µg/L	—	—	—	<0.0096	<0.0096
	Benzo(b)fluoranthene	2.5	µg/L	—	—	—	<0.024	<0.024
	Benzo(g,h,i)perylene	0.26	µg/L	—	—	—	<0.024	<0.024
	Benzo(k)fluoranthene	0.8	µg/L	—	—	—	<0.024	<0.024
	Chrysene	2	µg/L	—	—	—	<0.024	<0.024
	Dibenzo(a,h)anthracene	0.25	µg/L	—	—	—	<0.0096	<0.0096
	Fluoranthene	260	µg/L	—	—	—	<0.024	<0.024
	Fluorene	290	µg/L	—	—	—	<0.024	<0.024
	Indeno(1,2,3-cd)pyrene	0.19	µg/L	—	—	—	<0.024	<0.024
	Naphthalene	1.7	µg/L	—	—	—	<0.048	<0.048
	Phenanthrene	170	µg/L	—	—	—	<0.024	<0.024
	Pyrene	120	µg/L	—	—	—	<0.024	<0.024

mg/L	milligrams per liter
µg/L	micrograms per liter
—	Analysis not requested.
<	Analyte not detected; listed as less than the limit of quantitation (LOQ) unless otherwise flagged due to quality-control (QC) failures.
Bold	Concentration exceeds Alaska Department of Environmental Conservation (ADEC) groundwater cleanup level.
DUP	Field-duplicate sample
J	Estimated concentration, detected greater than the method detection limit (MDL) and less than the RL. Flag applied by the laboratory.
B*	Result is included in the same preparatory batch as a blank detection for the associated analyte. Flag applied by Shannon & Wilson, Inc.

LEGEND

- Building
- AFFF Release Site
- Airport Property Boundary

0 0.2 0.4

Miles

N

Nome Airport
Nome, Alaska

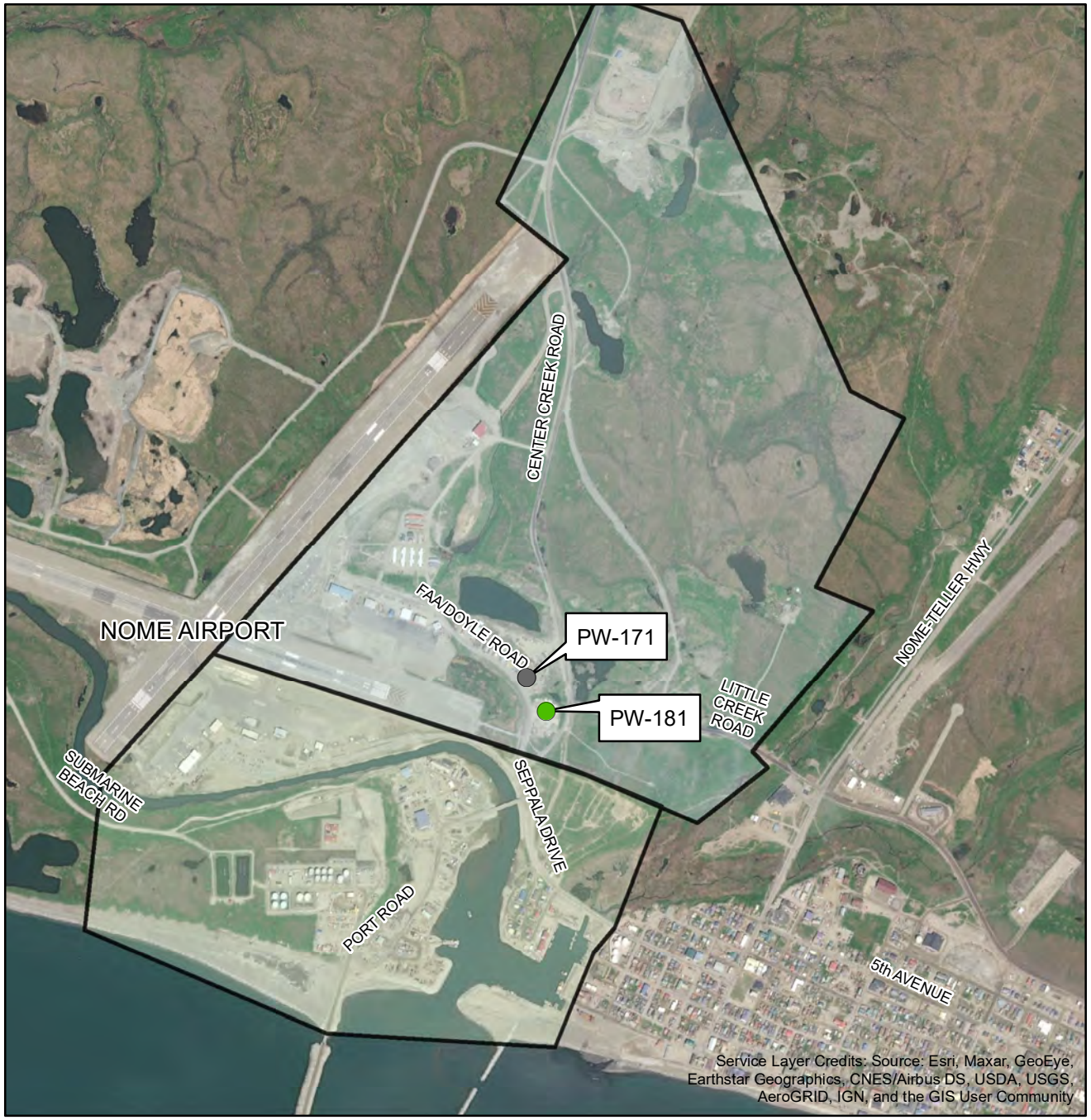
SITE MAP

April 2021

105745-002 / 003

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 1



LEGEND

- Sum of PFOS and PFOA ≤70 ng/L (Lifetime Health Advisory Level)
- Well not sampled
- Well Search Areas
- Area 1
- Area 2

N

0 0.25 0.5

Miles

Nome Airport
Nome, Alaska

WELL SEARCH AREA AND SAMPLE LOCATIONS

April 2021 105745-002 / 003

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 2

NOTE:
See Table 1 through Table 9 for Analytical Results.

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

2020 Site Characterization Sample Locations

- Soil Boring and Temporary Well Point
- Soil Boring and Monitoring Well
- Monitoring Well
- Surface Water
- Water Supply Well
- Soil Boring
- Surface Soil
- AFFF Release Site

N

0 0.25 0.5

Miles

Nome Airport
Nome, Alaska

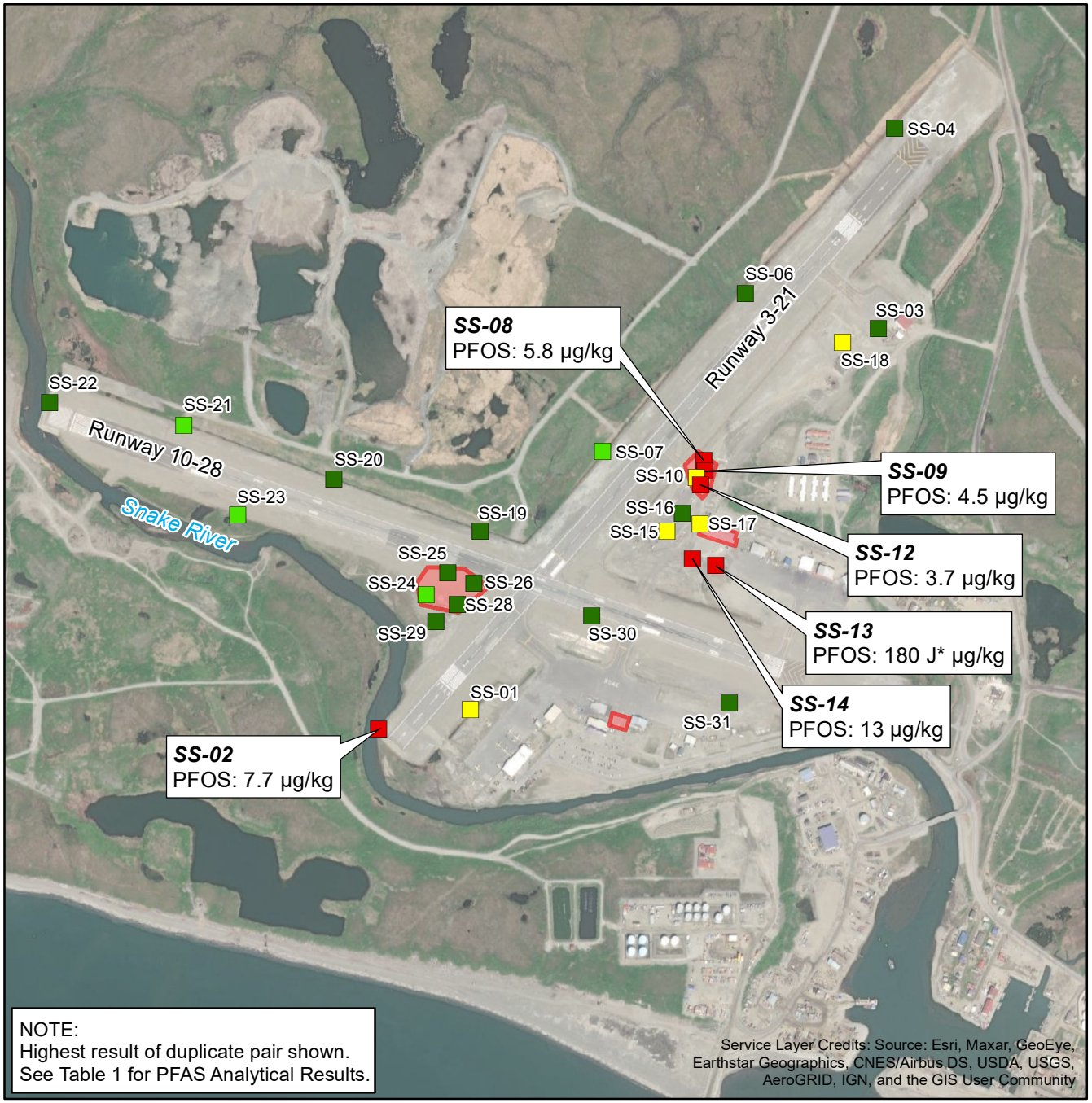
SAMPLE LOCATION OVERVIEW

April 2021

105745-002 / 003

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 3



LEGEND

PFOS Analytical Result

- <0.5 µg/kg
- 0.5 to 1.4 µg/kg
- 1.5 to 2.9 µg/kg
- ≥3.0 µg/kg (DEC Cleanup Level)
- AFFF Release Site

N

0 0.25 0.5

Miles

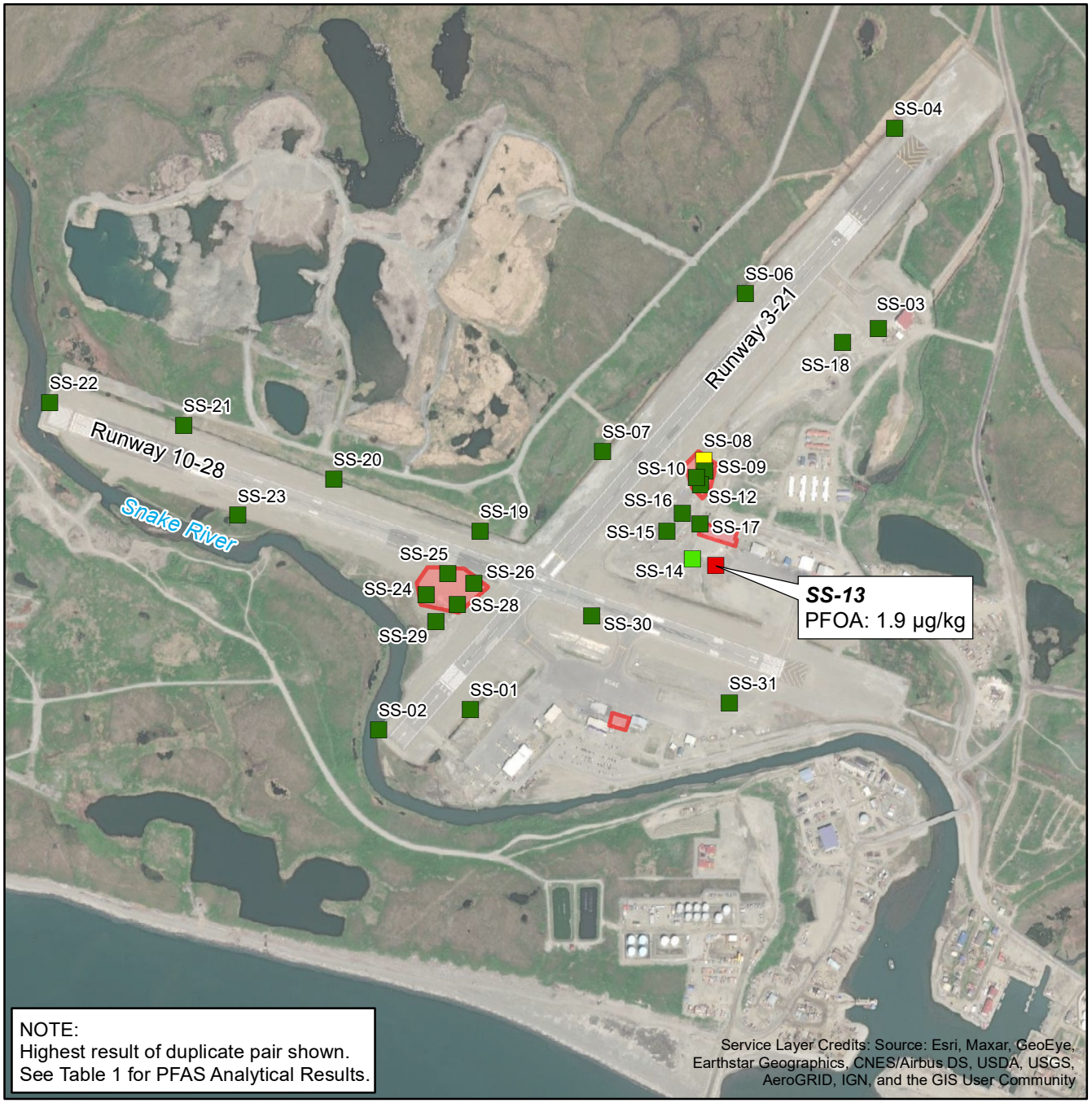
Nome Airport
Nome, Alaska

SURFACE SOIL PFOS SAMPLE LOCATIONS AND EXCEEDANCES

April 2021 105745-002 / 003

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 4



LEGEND

PFOA Analytical Result

- <0.3 µg/kg
- 0.3 to 0.89 µg/kg
- 0.9 to 1.6 µg/kg
- ≥1.7 µg/kg (DEC Cleanup Level)
- AFFF Release Site

N

0 0.25 0.5

Miles

Nome Airport
Nome, Alaska

SURFACE SOIL PFOA SAMPLE LOCATIONS AND EXCEEDANCES

April 2021 105745-002 / 003

SHANNON & WILSON, INC. GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 5

LEGEND

- Building
- Analyte(s) Do Not Exceed DEC Cleanup Level
- Analyte(s) Exceed DEC Cleanup Level
- AFFF Release Site

N

0 0.125 0.25

Miles

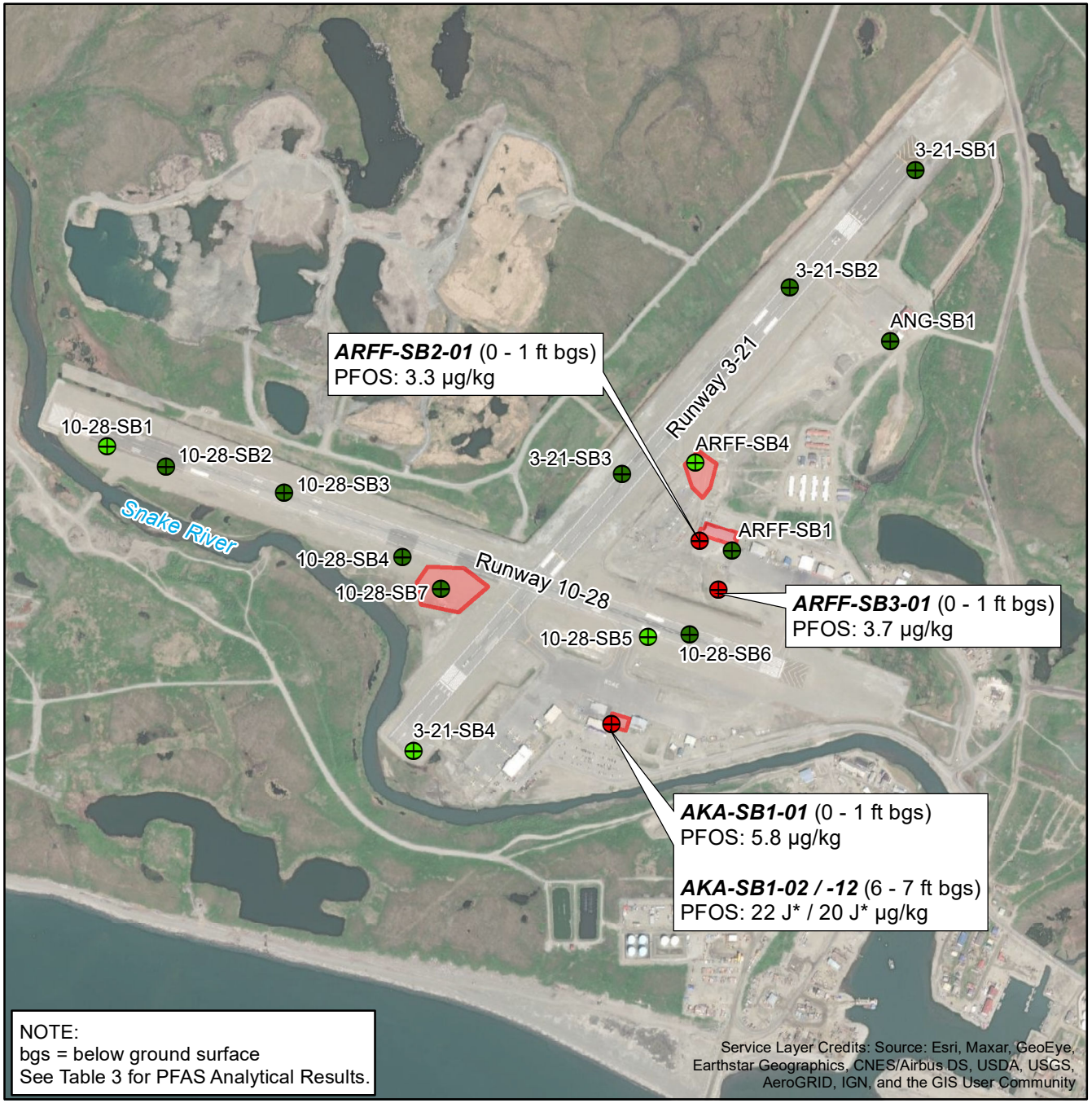
Nome Airport
Nome, Alaska

SURFACE SOIL PETROLEUM SAMPLE LOCATIONS AND EXCEEDANCES

April 2021 105745-002 / 003

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 6



LEGEND

PFOS Analytical Result

- <0.5 µg/kg
- 0.5 to 1.4 µg/kg
- 1.5 to 2.9 µg/kg
- ≥3.0 µg/kg (DEC Cleanup Level)
- AFFF Release Site

N

0 0.25 0.5

Miles

Nome Airport
Nome, Alaska

SOIL BORING PFOS SAMPLE LOCATIONS AND EXCEEDANCES

April 2021 105745-002 / 003

SHANNON & WILSON, INC. GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 7

NOTE:
PFAS detected in all samples at concentrations less than DEC cleanup level, where applicable. See Tables 5 and 7 for PFAS Analytical Results.

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

Surface Water and Sediment

AFFF Release Site

N

0 1,000 2,000

Feet

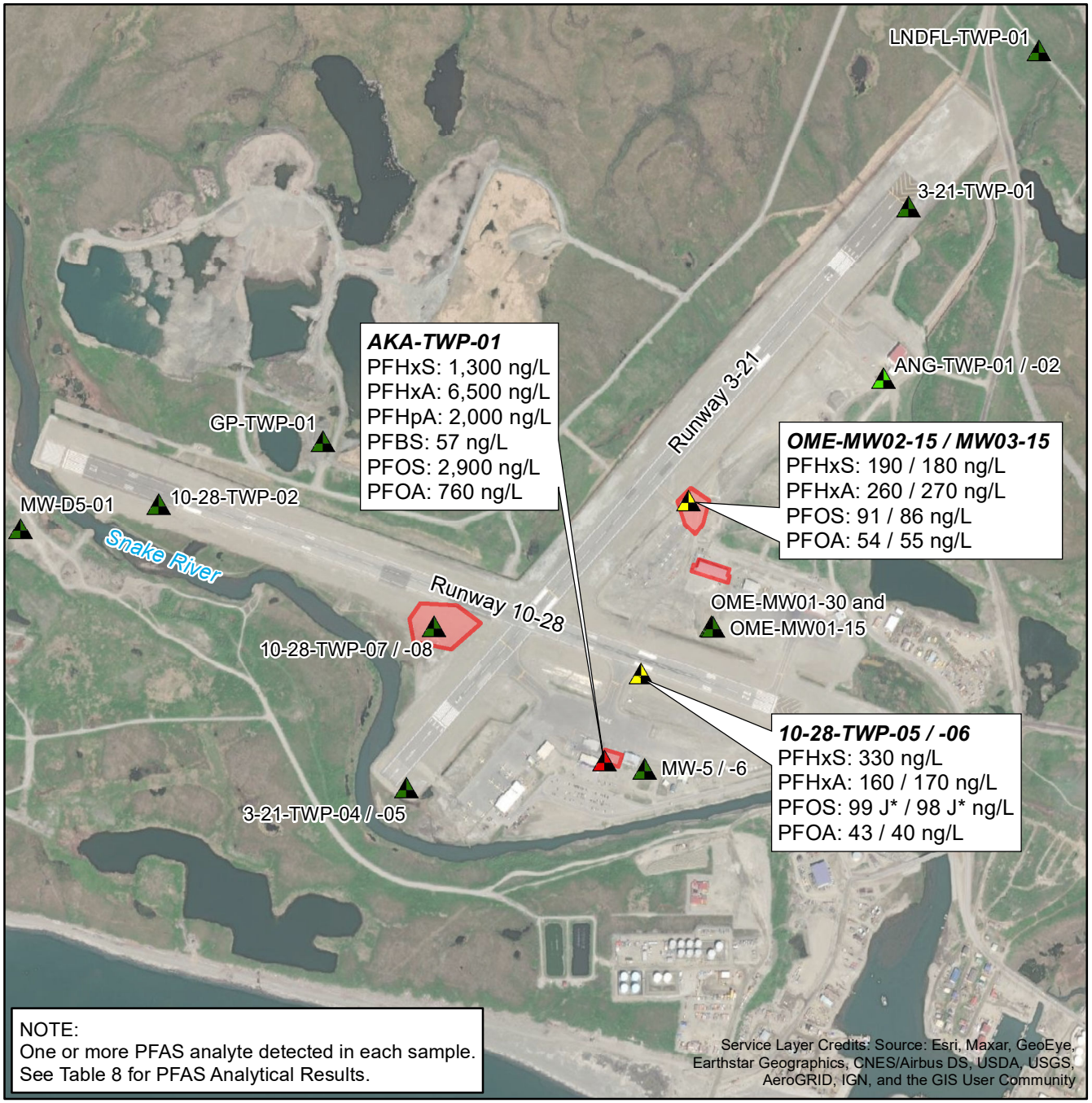
Nome Airport
Nome, Alaska

SURFACE WATER AND SEDIMENT SAMPLE LOCATIONS

April 2021 105745-002 / 003

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 8



LEGEND

Analytical Result for Any PFAS Compound

- <100 ng/L
- 100 to 200 ng/L
- 201 to 400 ng/L
- ≥400 ng/L (DEC Cleanup Level for PFOS and PFOA)
- AFFF release site

N

0 0.25 0.5

Miles

Nome Airport
Nome, Alaska

PFAS GROUNDWATER SAMPLE RESULTS

April 2021 105745-002 / 003

SHANNON & WILSON, INC. GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 9

LEGEND

Petroleum Compound Analytical Result

- Analyte(s) Do Not Exceed DEC Cleanup Level
- Analyte(s) Exceed DEC Cleanup Level
- AFFF Release Site

N

0 500 1,000

Feet

Nome Airport
Nome, Alaska

GROUNDWATER PETROLEUM SAMPLE LOCATIONS AND EXCEEDANCES

April 2021 105745-002 / 003

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 10

APPENDIX A: BORING LOGS

Appendix A

Boring Logs

LOG OF GEOPROBE

Date Started *10/24/20*	**Location** *Far west end of RW 10-28*	**Ground Elevation:** *Approx. NA feet*
Date Completed *10/24/20*		**Typical Run Length** *5 feet*
Total Depth (ft) *20.0*	**Drilling Company:** *GeoTek Alaska, Inc.*	**Hole Diameter:** *2.25 inches*

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number and Description.	Depth (ft)
0		Olive-brown to brown, *Poorly Graded Gravel with Sand (GP)*; moist.			2		10-28-SB1-01	0
5					3.9			5
10		Dark gray, *Sandy Silt (ML)*; moist, wet below 13.8'; few organics.	11.5		0.7		10-28-SB1-02	10
15						During Drilling ▽		15
20		BORING COMPLETED OCTOBER 24, 2020	20.0					20
25								25
30								30
35								35
40								40

Soil Description

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.

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.

LEGEND

▽ Estimated Water Level

DOT&PF Statewide PFAS
Nome

LOG OF GEOPROBE 10-28-SB1

February 2021 105745-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-1

REV 3

GEOPROBE - AK 105745-002.GPJ 21-16604.GPJ 1/28/21 Log: Rev: FLG Typ: JKR

LOG OF GEOPROBE

Date Started *10/25/20*	**Location** *West end of RW 10-28*	**Ground Elevation:** *Approx. NA feet*	
Date Completed *10/25/20*		**Typical Run Length** *5 feet*	
Total Depth (ft) *15.0*	**Drilling Company:** *GeoTek Alaska, Inc.*	**Hole Diameter:** *2.25 inches*	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number and Description.	Depth (ft)
0		Brown, *Poorly Graded Gravel with Silt and Sand (GP-GM)*; wet below 13.2'.			0.3		10-28-SB2-01	0
5					0.3		10-28-SB2-02	5
10					0.2			10
15		BORING COMPLETED OCTOBER 25, 2020	15.0			During Drilling ▽		15
20								20
25								25
30								30
35								35
40								40

Typ: JKR *Rev: FLG* *Log:*

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.

LEGEND

▽ Estimated Water Level

DOT&PF Statewide PFAS
Nome

LOG OF GEOPROBE 10-28-SB2

February 2021 105745-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-2

REV 3

GEOPROBE - AK 105745-002.GPJ 21-16604.GPJ 1/28/21

LOG OF GEOPROBE

Date Started *10/25/20*	**Location** *Within RW 10-28*	**Ground Elevation:** *Approx. NA feet*
Date Completed *10/25/20*		**Typical Run Length** *5 feet*
Total Depth (ft) *1.0*	**Drilling Company:** *GeoTek Alaska, Inc.*	**Hole Diameter:** *2.25 inches*

Depth (ft)	Probe Run	Soil Description *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.*	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number and Description.	Depth (ft)
0		Gray to gray-brown, *Poorly Graded Gravel with Sand (GP)*; moist.	1.0		0.5		10-28-SB3-01	0
		BORING COMPLETED OCTOBER 25, 2020						
5								5
10								10
15								15
20								20
25								25
30								30
35								35
40								40

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.

LEGEND

▽ Estimated Water Level

DOT&PF Statewide PFAS
Nome

LOG OF GEOPROBE 10-28-SB3

February 2021 105745-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-3

GEOPROBE - AK 105745-002.GPJ 21-16604.GPJ 1/28/21 Log: Rev: FLG Typ: JKR

REV 3

LOG OF GEOPROBE

Date Started *10/25/20*	**Location** *West of junction, next to RW 10-28*	**Ground Elevation:** *Approx. NA feet*	
Date Completed *10/25/20*		**Typical Run Length** *5 feet*	
Total Depth (ft) *15.0*	**Drilling Company:** *GeoTek Alaska, Inc.*	**Hole Diameter:** *2.25 inches*	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number and Description.	Depth (ft)
0		Dark gray to brown, *Poorly Graded Gravel with Sand (GP)*; moist to wet.			29.6			0
5					9.3			5
10		Dark brown to red-brown, *Organic Soil with Sand (OL/OH)*; moist.	9.5		2.8		10-28-SB4-02	10
		Brown, *Sandy Silt (ML)*; wet; trace gravel.	12.0			▽ During Drilling	10-28-SB4-03	
15		BORING COMPLETED OCTOBER 25, 2020	15.0					15
20								20
25								25
30								30
35								35
40								40

Typ: JKR
Rev: FLG
Log:

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.

LEGEND

▽ Estimated Water Level

DOT&PF Statewide PFAS
Nome

LOG OF GEOPROBE 10-28-SB4

February 2021 105745-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-4

GEOPROBE - AK 105745-002.GPJ 21-16604.GPJ 1/28/21

REV 3

LOG OF GEOPROBE

Date Started *10/25/20*	**Location** *East side of RW 10-28*	**Ground Elevation:** *Approx. NA feet*
Date Completed *10/25/20*		**Typical Run Length** *5 feet*
Total Depth (ft) *15.0*	**Drilling Company:** *GeoTek Alaska, Inc.*	**Hole Diameter:** *2.25 inches*

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number and Description.	Depth (ft)
0		Brown, *Poorly Graded Sand with Gravel (SP)*; moist.			0.5		10-28-SB5-01	0
5		Brown, *Poorly Graded Gravel with Sand (GP)*; moist.	5.0		0.1		10-28-SB5-02/12	5
10		Dark gray to gray-brown, *Poorly Graded Sand with Gravel (SP)*, wet.	9.2			▽ During Drilling		10
15		BORING COMPLETED OCTOBER 25, 2020	15.0					15
20								20
25								25
30								30
35								35
40								40

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.

LEGEND

▽ Estimated Water Level

DOT&PF Statewide PFAS
Nome

LOG OF GEOPROBE 10-28-SB5

February 2021 105745-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-5

REV 3

GEOPROBE - AK 105745-002.GPJ 21-16604.GPJ 1/28/21 Log: Rev: FLG Typ: JKR

LOG OF GEOPROBE

Date Started *10/25/20*	**Location** *Within RW 10-28*	**Ground Elevation:** *Approx. NA feet*
Date Completed *10/25/20*		**Typical Run Length** *5 feet*
Total Depth (ft) *1.0*	**Drilling Company:** *GeoTek Alaska, Inc.*	**Hole Diameter:** *2.25 inches*

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number and Description.	Depth (ft)
0		Brown, *Poorly Graded Gravel with Sand (GP)*; moist.	1.0		0.7		10-28-SB6-01	0
		BORING COMPLETED OCTOBER 25, 2020						
5								5
10								10
15								15
20								20
25								25
30								30
35								35
40								40

Soil Description

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.

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.

LEGEND

▽ Estimated Water Level

DOT&PF Statewide PFAS
Nome

LOG OF GEOPROBE 10-28-SB6

February 2021 105745-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-6

REV 3

GEOPROBE - AK 105745-002.GPJ 21-16604.GPJ 1/28/21 Log: Rev: FLG Typ: JKR

LOG OF GEOPROBE

Date Started *10/26/20*	**Location** *West of junction, north of PAPI shack*	**Ground Elevation:** *Approx. NA feet*
Date Completed *10/26/20*		**Typical Run Length** *5 feet*
Total Depth (ft) *15.0*	**Drilling Company:** *GeoTek Alaska, Inc.*	**Hole Diameter:** *2.25 inches*

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number and Description.	Depth (ft)
		Gray-brown, *Poorly Graded Sand with Silt and Gravel (SP-SM)*; moist.			0.3		10-28-SB7-01	
5		Gray, *Poorly Graded Gravel with Sand (GP)*; moist.	5.0		1.3			5
		Gray, *Organic Soil with Silt (OL/OH)*; moist; trace fiberous organics.	7.5 9.0				10-28-SB7-02/12	
10		Gray-brown to dark gray, *Well-Graded Gravel with Sand (GW)* to *Poorly Graded Gravel with Sand (GP)*; wet.				During Drilling ▽		10
15		BORING COMPLETED OCTOBER 26, 2020	15.0					15
20								20
25								25
30								30
35								35
40								40

Soil Description
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.

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.

LEGEND

▽ Estimated Water Level

DOT&PF Statewide PFAS
Nome

LOG OF GEOPROBE 10-28-SB7

February 2021 105745-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-7

REV 3

GEOPROBE - AK 105745-002.GPJ 21-16604.GPJ 1/28/21 Log: Rev: FLG Typ: JKR

LOG OF GEOPROBE

Date Started *10/23/20*	**Location** *Far north end of RW 3-21*	**Ground Elevation:** *Approx. NA feet*
Date Completed *10/23/20*		**Typical Run Length** *5 feet*
Total Depth (ft) *15.0*	**Drilling Company:** *GeoTek Alaska, Inc.*	**Hole Diameter:** *2.25 inches*

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number and Description.	Depth (ft)
0		Olive-gray to dark gray, *Poorly Graded Gravel with Sand (GP)*; moist, wet below 8.5'.			2.7		3-21-SB1-01	0
5					0.3		3-21-SB1-02	5
10		Dark gray, *Well-Graded Gravel with Sand and Silt (GW)*; wet.	10.0			During Drilling ▽		10
15		BORING COMPLETED OCTOBER 23, 2020	15.0					15
20								20
25								25
30								30
35								35
40								40

Soil Description
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.

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.

LEGEND

▽ Estimated Water Level

DOT&PF Statewide PFAS
Nome

LOG OF GEOPROBE 3-21-SB1

February 2021 105745-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-8

REV 3

GEOPROBE - AK 105745-002.GPJ 21-16604.GPJ 1/28/21 Log: Rev: FLG Typ: JKR

LOG OF GEOPROBE

Date Started *10/23/20*	**Location** *Within RW 3-21*	**Ground Elevation:** *Approx. NA feet*
Date Completed *10/23/20*		**Typical Run Length** *5 feet*
Total Depth (ft) *1.0*	**Drilling Company:** *GeoTek Alaska, Inc.*	**Hole Diameter:** *2.25 inches*

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number and Description.	Depth (ft)
0		Olive-gray, *Poorly Graded Gravel with Sand (GP)*; moist.	1.0		5.8		3-21-SB2-01	0
		BORING COMPLETED OCTOBER 23, 2020						
5								5
10								10
15								15
20								20
25								25
30								30
35								35
40								40

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.

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.

LEGEND

▽ Estimated Water Level

DOT&PF Statewide PFAS
Nome

LOG OF GEOPROBE 3-21-SB2

February 2021 105745-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-9

REV 3

GEOPROBE - AK 105745-002.GPJ 21-16604.GPJ 1/28/21 Log: Rev: FLG Typ: JKR

LOG OF GEOPROBE

Date Started *10/23/20*	**Location** *Within RW 3-21*	**Ground Elevation:** *Approx. NA feet*	
Date Completed *10/23/20*		**Typical Run Length** *5 feet*	
Total Depth (ft) *1.0*	**Drilling Company:** *GeoTek Alaska, Inc.*	**Hole Diameter:** *2.25 inches*	

Depth (ft)	Probe Run	Soil Description *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.*	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number and Description.	Depth (ft)
0		Olive-gray, *Poorly Graded Gravel with Sand (GP)*; moist.	1.0		0.7		3-21-SB3-01	0
		BORING COMPLETED OCTOBER 23, 2020						
5								5
10								10
15								15
20								20
25								25
30								30
35								35
40								40

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.

LEGEND

▽ Estimated Water Level

DOT&PF Statewide PFAS
Nome

LOG OF GEOPROBE 3-21-SB3

February 2021 105745-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-10

REV 3

GEOPROBE - AK 105745-002.GPJ 21-16604.GPJ 1/28/21 Log: Rev: FLG Typ: JKR

LOG OF GEOPROBE

Date Started *10/24/20*	**Location** *Far south end of RW 3-21*	**Ground Elevation:** *Approx. NA feet*
Date Completed *10/24/20*		**Typical Run Length** *5 feet*
Total Depth (ft) *15.0*	**Drilling Company:** *GeoTek Alaska, Inc.*	**Hole Diameter:** *2.25 inches*

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number and Description.	Depth (ft)
0		Olive-brown, *Poorly Graded Gravel with Sand (GP)*; moist, wet below 9.8'.			0.3		3-21-SB4-01	0
5					0.7		3-21-SB4-02	5
10						During Drilling ▽		10
		Dark gray, *Silt with Sand (ML)*; wet.	12.8					
15		BORING COMPLETED OCTOBER 24, 2020	15.0					15
20								20
25								25
30								30
35								35
40								40

Soil Description

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.

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.

LEGEND

▽ Estimated Water Level

DOT&PF Statewide PFAS
Nome

LOG OF GEOPROBE 3-21-SB4

February 2021 105745-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-11

REV 3

GEOPROBE - AK 105745-002.GPJ 21-16604.GPJ 1/28/21 Log: Rev: FLG Typ: JKR

LOG OF GEOPROBE

Date Started *10/27/20*	**Location** *Northeast corner of Alaska Airlines building, former ARFF building*	**Ground Elevation:** *Approx. NA feet*	
Date Completed *10/27/20*		**Typical Run Length** *5 feet*	
Total Depth (ft) *15.0*	**Drilling Company:** *GeoTek Alaska, Inc.*	**Hole Diameter:** *2.25 inches*	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number and Description.	Depth (ft)
0		Brown, *Poorly Graded Gravel with Sand (GP)*; moist.			0.6		AKA-SB1-01	0
5					0.2		AKA-SB1-02	5
		Gray-brown, *Silt with Sand (ML)*; moist.	6.8					
10								10
		Brown, *Poorly Graded Sand with Gravel (SP)*; wet.	12.5			▽ During Drilling		
15		BORING COMPLETED OCTOBER 27, 2020	15.0					15
20								20
25								25
30								30
35								35
40								40

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.

LEGEND

▽ Estimated Water Level

DOT&PF Statewide PFAS
Nome

LOG OF GEOPROBE AKA-SB1

February 2021 105745-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-12

REV 3

GEOPROBE - AK 105745-002.GPJ 21-16604.GPJ 1/28/21 Log: Rev: FLG Typ: JKR

LOG OF GEOPROBE

Date Started *10/23/20*	**Location** *South of National Guard hangar*	**Ground Elevation:** *Approx. NA feet*
Date Completed *10/23/20*		**Typical Run Length** *5 feet*
Total Depth (ft) *20.0*	**Drilling Company:** *GeoTek Alaska, Inc.*	**Hole Diameter:** *2.25 inches*

Depth (ft)	Probe Run	Soil Description *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.*	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number and Description.	Depth (ft)
0		Olive-gray, *Poorly Graded Gravel with Sand (GP)*; moist.			0.2		ANG-SB-01	0
5		Olive-brown to olive-gray, *Poorly Graded Sand with Gravel (SP)*; moist.	3.8		0.1			5
10		Olive-gray to dark gray, *Poorly Graded Gravel with Sand (GP)*; moist, wet below 14.0'.	10.0		0.1	During Drilling ▽	ANG-SB-02	10
15								15
20		BORING COMPLETED OCTOBER 23, 2020	20.0					20
25								25
30								30
35								35
40								40

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.

LEGEND

▽ Estimated Water Level

DOT&PF Statewide PFAS
Nome

LOG OF GEOPROBE ANG-SB1

February 2021 105745-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-13

REV 3

GEOPROBE - AK 105745-002.GPJ 21-16604.GPJ 1/28/21 Log: Rev: FLG Typ: JKR

LOG OF GEOPROBE

Date Started *10/24/20*	**Location** *Southeast corner of ARFF building*	**Ground Elevation:** *Approx. NA feet*
Date Completed *10/24/20*		**Typical Run Length** *5 feet*
Total Depth (ft) *15.0*	**Drilling Company:** *GeoTek Alaska, Inc.*	**Hole Diameter:** *2.25 inches*

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number and Description.	Depth (ft)
0		Olive-gray to dark gray, *Poorly Graded Gravel with Sand and Silt (GP)*; moist.			31.7		ARF-SB1-01	0
5					1.6		ARF-SB1-02	5
10						During Drilling ▽	ARF-SB1-03	10
15		BORING COMPLETED OCTOBER 24, 2020	15.0					15
20								20
25								25
30								30
35								35
40								40

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.

LEGEND

▽ Estimated Water Level

DOT&PF Statewide PFAS
Nome

LOG OF GEOPROBE ARFF-SB1

February 2021 105745-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-14

REV 3

GEOPROBE - AK 105745-002.GPJ 21-16604.GPJ 1/28/21 Log: Rev: FLG Typ: JKR

LOG OF GEOPROBE

Date Started *10/24/20*	**Location** *Southwest corner of ARFF building*	**Ground Elevation:** *Approx. NA feet*	
Date Completed *10/24/20*		**Typical Run Length** *5 feet*	
Total Depth (ft) *15.0*	**Drilling Company:** *GeoTek Alaska, Inc.*	**Hole Diameter:** *2.25 inches*	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number and Description.	Depth (ft)
0		Olive-brown to olive-gray, *Poorly Graded Gravel with Sand (GP)*; moist.			0.3		ARFF-SB2-01	0
5		Olive-gray to dark gray, *Poorly Graded Sand with Gravel (SP)* to *Poorly Graded Sand with Silt (SP-SM)*; moist; trace gravel.	4.3		9		ARFF-SB2-02	5
10		Dark gray, *Silty Sand (SM)*; wet.	10.0			▽ During Drilling	ARFF-SB2-03	10
15		BORING COMPLETED OCTOBER 24, 2020	15.0					15
20								20
25								25
30								30
35								35
40								40

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.

LEGEND

▽ Estimated Water Level

DOT&PF Statewide PFAS
Nome

LOG OF GEOPROBE ARFF-SB2

February 2021 105745-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-15

REV 3

GEOPROBE - AK 105745-002.GPJ 21-16604.GPJ 1/28/21 Log: Rev: FLG Typ: JKR

LOG OF GEOPROBE

Date Started *10/26/20*	**Location** *South of wind sock (MW01-15)*	**Ground Elevation:** *17.6*	
Date Completed *10/26/20*		**Typical Run Length** *5 feet*	
Total Depth (ft) *29.5*	**Drilling Company:** *GeoTek Alaska, Inc.*	**Hole Diameter:** *2.25 inches*	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Well Construction	Sample Number, Description, and Results	Depth (ft)
0		Brown to gray-brown, *Poorly Graded Sand with Gravel (SP)*; moist; few cobbles.			1.8			0
5					8			5
		Dark gray to red-brown, *Poorly Graded Gravel (GP)*; wet.	6.9			During Drilling		
		Gray-brown, *Poorly Graded Sand (SP)*; moist to wet.	8.6					
10		Gray-brown, *Sandy Silt (ML)*; wet; trace gravel.	10.0					10
15								15
20		Gray, *Silty Sand (SM)*, wet.	20.0					20
25								25
		Dark gray and brown, Schist Bedrock.	27.0					
30			29.5					30
		BORING COMPLETED OCTOBER 26, 2020						
35		Monitoring well details: Flush-mounted monument Top of casing is 0.45 feet bgs 2-inch-diameter PVC riser pipe 10/20 gradation Colorado Silica Sand pack Slot Size: 0.010 inches Slotted Interval: 5.05 to 15.10 feet bgs Total depth of well: 15.60 feet bgs						35
40								40

Typ: JKR
Rev: FLG
Log:
GEOPROBE_WELL 105745-002.GPJ 21-20447.GPJ 1/28/21

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

3 — 2" Plastic Tube - No Soil Recovery
2" Plastic Tube with Soil Recovery
Run No.

Piezometer Screen and Sand Filter

Ground Water Level ATD

DOT&PF Statewide PFAS
Nome

LOG OF GEOPROBE
ARFF-SB3 / OME-MW01-15

February 2021 105745-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-16

REV 3

LOG OF GEOPROBE

Date Started *10/26/20*	**Location** *South of wind sock (MW01-30)*	**Ground Elevation:** *17.5*	
Date Completed *10/26/20*		**Typical Run Length** *5 feet*	
Total Depth (ft) *29.5*	**Drilling Company:** *GeoTek Alaska, Inc.*	**Hole Diameter:** *2.25 inches*	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Well Construction	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.						
0		Brown to gray-brown, *Poorly Graded Sand with Gravel (SP)*; moist; trace cobbles.			1.8		ARFF-SB3-01	0
5					8		ARFF-SB3-02 ARFF-SB3-03/13	5
		Dark gray to red-brown, *Poorly Graded Gravel (GP)*; wet.	6.9			During Drilling		
		Gray-brown, *Poorly Graded Sand (SP)*; moist to wet.	8.6					
10		Gray-brown, *Sandy Silt (ML)*; wet.	10.0					10
15								15
20		Gray, *Silty Sand (SM)*; wet.	20.0					20
25								25
		Dark gray and brown, Schist Bedrock.	27.0					
30			29.5					30
35		BORING COMPLETED OCTOBER 26, 2020 Monitoring well details: Flush-mounted monument Top of casing is 0.52 feet bgs 2-inch-diameter PVC riser pipe 10/20 gradation Colorado Silica Sand pack Slot Size: 0.010 inches Slotted Interval: 24.28 to 29.13 feet bgs Total depth of well: 29.63 feet bgs						35
40								40

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

3 — *Run No.*

2" Plastic Tube - No Soil Recovery

2" Plastic Tube with Soil Recovery

Piezometer Screen and Sand Filter

Ground Water Level ATD

DOT&PF Statewide PFAS
Nome

LOG OF GEOPROBE
ARFF-SB3 / OME-MW01-30

February 2021 105745-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-17

REV 3

GEOPROBE WELL 105745-002.GPJ 21-20447.GPJ 1/28/21 Log: Rev: FLG Typ: JKR

LOG OF GEOPROBE

Date Started *10/26/20*	**Location** *North of ARFF building (MW02-15)*	**Ground Elevation:** *24.8*	
Date Completed *10/26/20*		**Typical Run Length** *5 feet*	
Total Depth (ft) *20.0*	**Drilling Company:** *GeoTek Alaska, Inc.*	**Hole Diameter:** *2.25 inches*	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Well Construction	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.						
0		Brown, *Poorly Graded Sand with Gravel (SP)*; moist to wet.			1.3		ARFF-SB4-01	0
5					0.7		ARFF-SB4-02	5
10						During Drilling	ARFF-SB4-03	10
		Dark gray to gray-brown, *Sandy Silt (ML)*; wet.	12.5					
15		Gray brown, *Sandy Silt (ML)*; frozen, Nbn.	15.0					15
20			20.0					20
		BORING COMPLETED OCTOBER 26, 2020						
25		Monitoring well details: Flush-mounted monument Top of casing is 0.42 feet bgs 2-inch-diameter PVC riser pipe 10/20 gradation Colorado Silica Sand pack Slot Size: 0.010 inches Slotted Interval: 4.24 to 14.29 feet bgs Total depth of well: 14.79 feet bgs						25
30								30
35								35
40								40

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

- 3 — *Run No.*
- 2" Plastic Tube - No Soil Recovery
- 2" Plastic Tube with Soil Recovery
- Piezometer Screen and Sand Filter
- Ground Water Level ATD

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Nome

LOG OF GEOPROBE
ARFF-SB4 / OME-MW02-15

February 2021 105745-002

SHANNON & WILSON, INC.
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FIG. A-18

REV 3

GEOPROBE WELL 105745-002.GPJ 21-20447.GPJ 1/28/21 Log: Rev: FLG Typ: JKR

LOG OF GEOPROBE

Date Started *10/25/20*	**Location** *Gravel pit northwest of runway*	**Ground Elevation:** *Approx. NA feet*	
Date Completed *10/25/20*		**Typical Run Length** *5 feet*	
Total Depth (ft) *15.0*	**Drilling Company:** *GeoTek Alaska, Inc.*	**Hole Diameter:** *2.25 inches*	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number and Description.	Depth (ft)
0		Dark gray, *Poorly Graded Gravel with Sand (GP)*; moist.						0
		Dark gray to gray-brown, *Silty Gravel with Sand (GM)*; wet.	2.9					
5		Gray-brown to olive-brown, *Sandy Silt (ML)*; wet.	5.0			During Drilling ▽		5
10		Red-brown, *Poorly Graded Sand with Gravel (SP)*; wet.	12.0					10
15		BORING COMPLETED OCTOBER 25, 2020	15.0					15
20								20
25								25
30								30
35								35
40								40

Soil Description
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.

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.

LEGEND

▽ Estimated Water Level

DOT&PF Statewide PFAS
Nome

LOG OF GEOPROBE GP-SB1

February 2021 105745-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-19

REV 3

GEOPROBE - AK 105745-002.GPJ 21-16604.GPJ 1/28/21 Log: Rev: FLG Typ: JKR

LOG OF GEOPROBE

Date Started *10/25/20*	**Location** *North of airport*	**Ground Elevation:** *Approx. NA feet*	
Date Completed *10/25/20*		**Typical Run Length** *5 feet*	
Total Depth (ft) *15.0*	**Drilling Company:** *GeoTek Alaska, Inc.*	**Hole Diameter:** *2.25 inches*	

Depth (ft)	Probe Run	Soil Description	Depth, ft.	Symbol	PID, ppm	Ground Water	Sample Number and Description.	Depth (ft)
0		Brown, *Poorly Graded Gravel with Sand (GP)*; moist; trace organics.			3.8			0
5					3	During Drilling ▽		5
		Gray-brown, *Silt with Sand (ML)*; moist, wet below 7.6'.	6.9					
		Red-brown to red-yellow, *Poorly Graded Gravel with Sand (GP)*; wet.	8.4					
10		Olive-brown to dark gray, *Well-Graded Gravel with Sand (GW)*; wet.	10.0					10
15		BORING COMPLETED OCTOBER 25, 2020	15.0					15
20								20
25								25
30								30
35								35
40								40

Soil Description
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.

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.

LEGEND

▽ Estimated Water Level

DOT&PF Statewide PFAS
Nome

LOG OF GEOPROBE Lndfl-SB1

February 2021 105745-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-20

REV 3

GEOPROBE - AK 105745-002.GPJ 21-16604.GPJ 1/28/21 Log: Rev: FLG Typ: JKR

Shannon & Wilson, Inc. (S&W), uses a soil classification 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 D 2488-93) unless otherwise noted.

S&W CLASSIFICATION OF SOIL CONSTITUENTS

- MAJOR constituents compose more than 50 percent, by weight, of the soil. Major consituents are capitalized (i.e., SAND).
- Minor constituents compose 12 to 50 percent of the soil and precede the major constituents (i.e., silty SAND). Minor constituents preceded by "slightly" compose 5 to 12 percent of the soil (i.e., slightly silty SAND).
- Trace constituents compose 0 to 5 percent of the soil (i.e., slightly silty SAND, trace of gravel).

MOISTURE CONTENT DEFINITIONS

Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, from below water table

ABBREVIATIONS

ATD	At Time of Drilling
Elev.	Elevation
ft	feet
FeO	Iron Oxide
MgO	Magnesium Oxide
HSA	Hollow Stem Auger
ID	Inside Diameter
in	inches
lbs	pounds
Mon.	Monument cover
N	Blows for last two 6-inch increments
NA	Not applicable or not available
NP	Non plastic
OD	Outside diameter
OVA	Organic vapor analyzer
PID	Photo-ionization detector
ppm	parts per million
PVC	Polyvinyl Chloride
SS	Split spoon sampler
SPT	Standard penetration test
USC	Unified soil classification
WOH	Weight of hammer
WOR	Weight of drill rods
WLI	Water level indicator

GRAIN SIZE DEFINITION

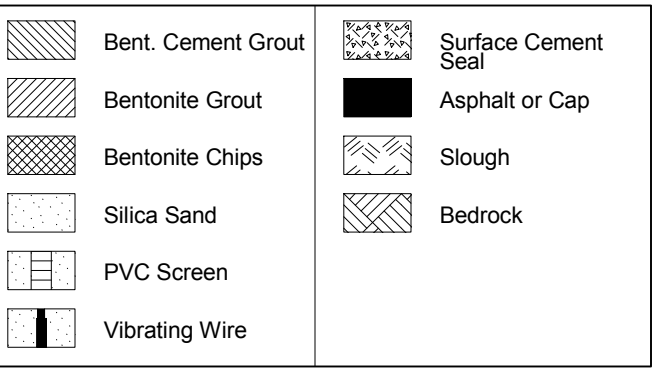
DESCRIPTION	SIEVE NUMBER AND/OR SIZE
FINES	< #200 (0.08 mm)
SAND* - Fine - Medium - Coarse	 #200 to #40 (0.08 to 0.4 mm) #40 to #10 (0.4 to 2 mm) #10 to #4 (2 to 5 mm)
GRAVEL* - Fine - Coarse	 #4 to 3/4 inch (5 to 19 mm) 3/4 to 3 inches (19 to 76 mm)
COBBLES	3 to 12 inches (76 to 305 mm)
BOULDERS	> 12 inches (305 mm)

* Unless otherwise noted, sand and gravel, when present, range from fine to coarse in grain size.

RELATIVE DENSITY / CONSISTENCY

COARSE-GRAINED SOILS		FINE-GRAINED SOILS	
N, SPT, BLOWS/FT.	RELATIVE DENSITY	N, SPT, BLOWS/FT.	RELATIVE CONSISTENCY
0 - 4	Very loose	Under 2	Very soft
4 - 10	Loose	2 - 4	Soft
10 - 30	Medium dense	4 - 8	Medium stiff
30 - 50	Dense	8 - 15	Stiff
Over 50	Very dense	15 - 30	Very stiff
		Over 30	Hard

WELL AND OTHER SYMBOLS



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Nome

SOIL CLASSIFICATION AND LOG KEY

February 2021 105745-002

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A-21

BORING_CLASS1 31-11612.GPJ SWNEW.GDT 11/20/12

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)
(From ASTM D 2487-98 & 2488-93)

MAJOR DIVISIONS			GROUP/GRAPHIC SYMBOL		TYPICAL DESCRIPTION
COARSE-GRAINED SOILS *(more than 50% retained on No. 200 sieve)*	Gravels *(more than 50% of coarse fraction retained on No. 4 sieve)*	Clean Gravels *(less than 5% fines)*	GW		Well-graded gravels, gravels, gravel/sand mixtures, little or no fines.
			GP		Poorly graded gravels, gravel-sand mixtures, little or no fines
		Gravels with Fines *(more than 12% fines)*	GM		Silty gravels, gravel-sand-silt mixtures
			GC		Clayey gravels, gravel-sand-clay mixtures
	Sands *(50% or more of coarse fraction passes the No. 4 sieve)*	Clean Sands *(less than 5% fines)*	SW		Well-graded sands, gravelly sands, little or no fines
			SP		Poorly graded sand, gravelly sands, little or no fines
		Sands with Fines *(more than 12% fines)*	SM		Silty sands, sand-silt mixtures
			SC		Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS *(50% or more passes the No. 200 sieve)*	Silts and Clays *(liquid limit less than 50)*	Inorganic	ML		Inorganic silts of low to medium plasticity, rock flour, sandy silts, gravelly silts, or clayey silts with slight plasticity
			CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		Organic	OL		Organic silts and organic silty clays of low plasticity
	Silts and Clays *(liquid limit 50 or more)*	Inorganic	MH		Inorganic silts, micaceous or diatomaceous fine sands or silty soils, elastic silt
			CH		Inorganic clays or medium to high plasticity, sandy fat clay, or gravelly fat clay
		Organic	OH		Organic clays of medium to high plasticity, organic silts
HIGHLY-ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor		PT		Peat, humus, swamp soils with high organic content (see ASTM D 4427)

NOTE: No. 4 size = 5 mm; No. 200 size = 0.075 mm

NOTES

1. Dual symbols *(symbols separated by a hyphen, i.e., SP-SM, slightly silty fine SAND)* 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.

2. Borderline symbols *(symbols separated by a slash, i.e., CL/ML, silty CLAY/clayey SILT; GW/SW, sandy GRAVEL/gravelly SAND)* indicate that the soil may fall into one of two possible basic groups.

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Nome

SOIL CLASSIFICATION AND LOG KEY

February 2021 105745-002

SHANNON & WILSON, INC.
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FIG. A-21

BORING_CLASS2 31-11612.GPJ SWNEW.GDT 11/20/12

APPENDIX B: FIELD NOTES

Appendix B

Field Notes

CONTENTS

SHANNON & WILSON, INC.

SAMPLE COLLECTION LOG

Project Number: 105745 Location: Nome Airport Page 1 of 1

Date: 10/23/20 to 10/24/20

Sampler: Adam Wyborny

Sample Number	Location	Sample Time	Depth Interval (ft) top	Depth Interval (ft) bottom	Matrix Type	Sampling Method	Sample Type	PID Reading	Analyses
3-21-SB1-01	North end of runway 3-21	19:00	0'	1'	ES	G		2.7	PFAS
3-21-SB1-02		19:15	6'	7'	ES	G		0.3	PFAS
3-21-SB2-01	Runway crack, northern half	21:30	0'	1'	ES	G		5.8	PFAS
3-21-SB3-01	Runway crack, mid to southern	22:00	0'	1'	ES	G		0.7	PFAS
ANG-SB1-01	South of ANG hanger	23:20	0'	1'	ES	G		0.2	PFAS
ANG-SB1-10	↓	23:10	0'	1'	FD	G		0.1	PFAS
ANG-SB1-02	↓	23:25	9'	10'	ES	G		0.1	PFAS
3-21-SB4-01	South end of runway 3-21	01:45	0'	1'	ES	G		0.3	PFAS
3-21-SB4-02	↓	01:55	5'	6'	ES	G		0.9	PFAS
ARFF-SB1-01	SE corner of the ARFF	03:35	0'	1'	ES	G		31.7	PFAS
ARFF-SB1-02	↓	03:45	5'	6'	ES	G		1.6	PFAS
ARFF-SB1-03	↓	04:00	10'	11'	ES	G		—	PFAS, DRO, RRO, GRO
ARFF-SB2-01	SW corner of the ARFF	04:30	0'	1'	ES	G		0.3	PFAS
ARFF-SB2-02	↓	04:45	5'	6'	ES	G		9.0	PFAS
ARFF-SB2-03	↓	04:55	9'	10'	ES	G		—	PFAS, DRO, RRO, GRO

10/23

10/24

Matrix Type		Sampling Method		Sample Type	
AR	Air	B	Bailer/Coliwas	ES	Environmental sample
GW	Groundwater	D	Drill cuttings	ER	Equipment rinsate
PR	Product	G	Grab sampling	FB	Field blank
SB	Subsurf. soil	H	Hand auger	FD	Field duplicate
SE	Sediment	L	Tube liner	FM	Field measurement
SG	Sludge	P	Pump (liquid)	FR	Field replicate
SS	Surface soil	SS	Split spoon	MD	Matrix spike duplicate
SW	Surface water	T	Shelby tube	MS	Matrix spike duplicate
WR	Water	V	Vacuum (gas)	TB	Trip blank
		W	Wipe sampling		

MDW

SHANNON & WILSON, INC.

SAMPLE COLLECTION LOG

Project Number: 105745 Location: OME Runway 10-28 Page 1 of 1

Date: 10/24 - 10/25

Sampler: Adam Wyborny

Sample Number	Location	Sample Time	Depth Interval (ft) top	Depth Interval (ft) bottom	Matrix Type	Sampling Method	Sample Type	PID Reading	Analyses
10-28-SB1-01	Runway 10-28 west end	23:10	0'	1'	Soil	G	ES	2.0	PFAS
10-28-SB1-02	↓	23:30	11.5'	12.5'	Soil	G	ES	0.7	PFAS
10-28-SB2-01	Runway 10-28 west end, east	00:45	0'	1'	Soil	G	ES	0.3	PFAS
10-28-SB2-02	of SB1.	00:55	6'	7'	Soil	G	ES	0.3	PFAS
10-28-SB3-01	crack in 10-28 west of 3-21	01:20	0'	1'	Soil	G	ES	0.5	PFAS
10-28-SB4-01	South of 10-28 immediately	02:55	0'	1'	Soil	G	ES	29.6	PFAS (sample collected)
10-28-SB4-02	west of intersection with 3-21	03:10	9.5'	10'	Soil	G	ES	9.3	PFAS
10-28-SB4-03		03:30	11.5'	12.5'	Soil	G	ES	2.8	PFAS, DRO, RRO, GRO
10-28-SB5-01	South of 10-28 east of	04:40	0'	1'	Soil	G	ES	0.5	PFAS
10-28-SB5-02	intersection with 3-21	04:55	5'	6'	Soil	G	ES	0.1	PFAS
10-28-SB5-12		04:45	5'	6'	Soil	G	FD	" "	PFAS
10-28-SB6-01	Eastern end of Runway 10-28	05:10	0'	1'	Soil	G	ES	0.7	PFAS

Matrix Type		Sampling Method		Sample Type	
AR	Air	B	Bailer/Coliwas	ES	Environmental sample
GW	Groundwater	D	Drill cuttings	ER	Equipment rinsate
PR	Product	G	Grab sampling	FB	Field blank
SB	Subsurf. soil	H	Hand auger	FD	Field duplicate
SE	Sediment	L	Tube liner	FM	Field measurement
SG	Sludge	P	Pump (liquid)	FR	Field replicate
SS	Surface soil	SS	Split spoon	MD	Matrix spike duplicate
SW	Surface water	T	Shelby tube	MS	Matrix spike duplicate
WR	Water	V	Vacuum (gas)	TB	Trip blank
		W	Wipe sampling		

MDW

SOIL SAMPLE COLLECTION LOG

Project Number: 105745 Project Name: DOT & PF Statewide PFAS - OME Page 1 of 1

Date: 10/26/2020

Sampler: Adam Wyborny

Sample Number	Location	Sample Date	Sample Time	Depth Interval (ft)	Sample Type	PID Reading	Analyses
10-28-SB7-01	South of Runway 10-28, west of the	10/26	00:10	0'-1'	ES	0.3	PFAS
10-28-SB7-02	intersection with Runway 3-21. Near	10/26	00:25	7.5'-8.5'	ES	1.3	PFAS
10-28-SB7-12	the Pappy shack.	10/26	00:15	" "	FD	" "	PFAS

Sample Type FS = Field screening measurement only ES = Environmental sample FD = Field duplicate TB = Trip blank EB = Equipment blank FB = Field blank

MDN

SHANNON & WILSON, INC.

SAMPLE COLLECTION LOG

Project Number: 105745 Location: OME Page 1 of 1

Date: 10/26/20

Sampler: Adam Wyborny

Sample Number	Location	Sample Time	Depth Interval (ft) top	Depth Interval (ft) bottom	Matrix Type	Sampling Method	Sample Type	PID Reading	Analyses
ARFF-SB3-01	South of ARFF building, north	16:25	0'	1'	Soil	G	ES	1.8	PFAS
ARFF-SB3-02	of Runway 10-28, near windsock	16:35	5'	6'	Soil	G	ES	8.0	PFAS
ARFF-SB3-03	↓	16:50	8.5'	10'	Soil	G	ES	—	PFAS, DRO, RRO, PAH, GRO
ARFF-SB3-13	↓	16:40	8.5'	10'	Soil	G	FD	—	PFAS, DRO, RRO, PAH, GRO
ARFF-SB4-01	North of ARFF building by	19:15	0'	1'	Soil	G	ES	1.3	PFAS
ARFF-SB4-02	taxiway H.	19:25	5'	6'	Soil	G	ES	0.7	PFAS
ARFF-SB4-03	↓	19:45	8'	9'	Soil	G	ES	—	PFAS, DRO, RRO, GRO

Matrix Type		Sampling Method		Sample Type	
AR	Air	B	Bailer/Coliwas	ES	Environmental sample
GW	Groundwater	D	Drill cuttings	ER	Equipment rinsate
PR	Product	G	Grab sampling	FB	Field blank
SB	Subsurf. soil	H	Hand auger	FD	Field duplicate
SE	Sediment	L	Tube liner	FM	Field measurement
SG	Sludge	P	Pump (liquid)	FR	Field replicate
SS	Surface soil	SS	Split spoon	MD	Matrix spike duplicate
SW	Surface water	T	Shelby tube	MS	Matrix spike duplicate
WR	Water	V	Vacuum (gas)	TB	Trip blank
		W	Wipe sampling		

MDN

SOIL SAMPLE COLLECTION LOG

Project Number: 105745 Project Name: Nome DOT&PF PFAS/OME Page 1 of 1

Sampler: MDN/VTY/APW

Date	Sample ID	Location	Sample Time	Depth (ft)	Sample Type	PID Reading	Analytes	Analyses (Soil Type)
10/27/20	SS-01	West side of RW 3-21 near Bering Air (collected by hand digging w/ 2 inch frozen)	1112	2-3"	ES	N/A	PFAS x18	Sa. silt, occ. roots
	SS-02	South end of RW 3-21, SW corner of RW	1135	1-2"				Sa. gravel, occ. roots
	SS-03	South west of ARNG hangar	1155	0-1"				gravel fill
	SS-04	North/west corner of RW 3-21	1215	2-3"				Sa. silt w/ gravel + roots
	SS-05	DUP of SS-04	1205	1-3"	DUP			same
	SS-06	West of RW 3-21, south of Juliet	1235	1-3"	ES			Sa. silt w/ gravel (fill)
	SS-07	" " " " , south of Hotel	1300	1-3"	ES			Silty sa. w/ gravel
~~10/29/20~~	~~SS-08~~ (NU)							
		(Collected w/ Bosch hammer)						
10/29/20	SS-08	North end spray area NW of ARFF bldg	1230	2-3"	ES	0.3	PFAS+perol	Silty sa. w/ fine gravel
	SS-09	West " " "	1300	2-3"		0.2		Silty sa w/ gravel
	SS-10	just east of Taxiway Hotel, vehicle traffic here	2030	2-3"		20.8		Silty sa no gravel
	SS-11	DUP of SS-10	2035	2-3"	DUP	N/A		Same
	SS-12	South end spray area, vehicle traffic here	21:00	2-3"	ES	33.2	+PPMs	Silty sa w/ gravel
	SS-13	South of SE corner of ARFF bldg, N of wind sock	15:35	2-3"		2.4		Sandy silt w/ gravel
	SS-14	downhill/South of SW corner of ARFF bldg (low spot)	1605	2-3"		1.0		Silty sand (some vegn)
	SS-15	South portion aircraft parking (general use area)	1625	2-3"		0.3		silty sand w/ gravel (some vegn)
	SS-16	north " " " " " "	16:50	2-3"		1.4		Silty sand (some vegn)
	SS-17	west of ARFF bldg, just inside fence	19:55	1-2"		4.5		Sandy silty sa w/ gravel
	EB-SS-12	Rinsate blank on Bosch bit (after last sample)	2115	N/A	EB	N/A	N/A	N/A
~~10/29~~	FB-SS-12	Field blank in spray area ~~NW of~~ by Taxiway Hotel	2100	N/A	FB		N/A	N/A
10/30/20	SS-18	low lying area SW of ~~ARFF~~ ARNG bldg, fire training	1435	1-2"	ES	2.1	PFAS	Silty fill (sa/gravel)
	SS-19	North side 10-28, west of junction (first area)	1555	1-2"		N/A		Silty sand, pulverized rock
	SS-20	North side RW 10-28, SE of gravel pit @ crest of hillslope	1605	1-2"				Silty sa. w/ gravel
	SS-21	" " " near W end, just east of roadway	1620	1-2"				Sandy gravel fill
	SS-22	West end RW 10-28 off embankment next to river	2145	2-3"				C. sand & gravel, no vegn
	SS-23	South side RW 10-28, south of gravel pit, tundra/abandon vegn	2135	2-3"				~~Silty~~ sandy silt w/ some vegn
	SS-24	" " of junction spray area in vegetation	1710	1-2"				Silty sa., in vegn (some vegn)
	SS-25	north side " " " " near RW 10-28	1725	1-2"				Sandy silt, no gravel
	SS-26	NE side of spray area, in dip	1755	1-2"				Silty sa., no gravel
	SS-27	DUP of SS-26	1800	1-2"	DUP			same
	SS-28	Southeast side junction spray area, low lying area NE of	1745	1-2"	ES			Sandy silt, no gravel
	SS-29	South of PAPI shack, low lying drainage channel	1810	1-2"				Sandy silt, vegetation
	SS-30	SE of RW junction, near end of RW 10-28 pavement	2100	2-3"				Sandy fill (some silt)
	SS-31	E end of RW 10-28, low spot just west of storm drain	2110	2-3"				Sandy silt w/ vegn, lots silt
	EB-SS-22	~~Field blk~~ Rinsate blank on Bosch + shovel (after last sample)	2200	N/A	EB		PFAS	N/A

Sample Type FS = Field screening measurement only ES = Environmental sample FD = Field duplicate TB = Trip blank FB = Field Blank EB = Equipt Blk

SOIL SAMPLE COLLECTION LOG

Project Number: 105745 Project Name: DOT & PF Statewide PFAS - OME

Date: 10/27/2020

Sampler: Adam Wyborny

Sample Number	Location	Sample Date	Sample Time	Depth Interval (ft)	Sample Type	PID Reading	Analyses
AKA-SB1-01	Near the northeast corner of the	10/27	18:00	0' - 1'	ES	0.6	PFAS
AKA-SB1-02	Alaska Airlines terminal in OME	10/27	18:15	6' - 7'	ES	0.2	PFAS
AKA-SB1-12		10/27	18:05	6' - 7'	FD	—	PFAS

Sample Type FS = Field screening measurement only ES = Environmental sample FD = Field duplicate TB = Trip blank EB = Equipment blank FB = Field blank

MDN

SURFACE WATER SAMPLE LOG

Date: 10/20/2020	Project: Nome Airport
Field Investigators: APW, VTT	
Name of Water Body: SW-01	
Location of Water Body: next to dredge (see map) near FAA housing complex	
Type of Water Body: pond	
Sample Location: surface water + sediment	
Sample Number: SW-01	Sample Time: 1609
Method of Collection: solo cup	
Temperature (°C): 4.8	
pH: 7.89	
Conductivity: 272.0	
DO (mg/l): 10.10	
Turbidity (NTU): —	
Appearance: clear	
Analyses requested: PFAS x18	
Comments: —	

Product Observed?	Yes	(No)	
Product Collected?	Yes	(No)	

Checked By:

MDW

SURFACE WATER SAMPLE LOG

Date: 10/20/2020		Project: Nome Airport	
Field Investigators: APW, VTY			
Name of Water Body: SW-02			
Location of Water Body: Southwestern end of large pond east of FAA/Doyle Road and west of Center Crk Road, near where DOT&PF ARFF bldg access Road turns off			
Type of Water Body: pond			
Sample Location: surface water + sediment			
Sample Number: SW-02 / SW-03 (DUP) Sample Time: 1640 / 1630			
Method of Collection: solo cup			
Temperature (°C): 5.0			
pH: 7.68			
Conductivity: 150.4			
DO (mg/l): 9.44			
Turbidity (NTU): —			
Appearance: clear			
Analyses requested: PFAS x18			
Comments: —			
Product Observed?	Yes	(No)	
Product Collected?	Yes	(No)	

Checked By:

MDN

4

SURFACE WATER SAMPLE LOG

Date: 10/20/2020		Project: Nome Airport	
Field Investigators: APW, VTY			
Name of Water Body: SW-04			
Location of Water Body: see map, small pond near junction of FAA/Doyle Road and Carter Creek Road, next to D Trucking lot			
Type of Water Body: pond			
Sample Location: surface water + sediment			
Sample Number: SW-04		Sample Time: 1700	
Method of Collection: grab			
Temperature (°C): 3.9°C			
pH: 8.20			
Conductivity: 187.2			
DO (mg/l): 9.02			
Turbidity (NTU): —			
Appearance: clear			
Analyses requested: PFAS x18			
Comments: —			
Product Observed?	Yes	No	
Product Collected?	Yes	No	

Checked By:

MDN

SURFACE WATER SAMPLE LOG

Date: 10/20/2020	Project: Nome Airport
Field Investigators: APW, VTY	
Name of Water Body: SW-05	
Location of Water Body: see map (south of ANG hangar) outside fence	
Type of Water Body: creek	
Sample Location: surface water	
Sample Number: SW-05	Sample Time: 1730
Method of Collection: grab	
Temperature (°C): 3.2	
pH: 7.73	
Conductivity: 268.3	
DO (mg/l): 11.92	
Turbidity (NTU): —	
Appearance: clear	
Analyses requested: PFAS x18	
Comments: —	

Product Observed?	Yes	(No)	
Product Collected?	Yes	(No)	

Checked By:

MDN

SURFACE WATER SAMPLE LOG

Date: 10/22/20 Project: 105745-002

Field Investigators: VTY/MDN

Name of Water Body: SW-06

Location of Water Body: standing water in drainage ditch on west side of RW 3-21 across from ARNG hangar

Type of Water Body: pond, fed by drainage ditch, stream and direct runoff from RW

Sample Location: southwest corner of swamp/pond, standing water + sediment

Sample Number: SW-06 Sample Time: 1145

SD-06 Sample time: 1146

Method of Collection: grab w/ cup

Temperature (°C): 3.4

pH: 6.95

Conductivity: ~~365~~ 366.3

DO (mg/l): 3.36

Turbidity (NTU): clear (visual)

Appearance:

Analyses requested: PFAS x18

Comments: silt sandy, abundant vegetation
obs flowing water ~~to~~ @ northwest corner of swamp

Product Observed?	Yes	No (circled)	
Product Collected?	Yes	No (circled)	

Checked By: MDN

SURFACE WATER SAMPLE LOG

Date: 10/22/20	Project: OME
Field Investigators: VTY / MDN	
Name of Water Body: SW-07	
Location of Water Body: ~~South~~ east end of RW-28 where it flows under the roadway	
Type of Water Body: creek	
Sample Location: downstream of culvert	
Sample Number: SW-07	Sample Time: 1202
Method of Collection: grab	
Temperature (°C): 1.5	
pH: 7.97	
Conductivity: 307.4	
DO (mg/l): 10.94	
Turbidity (NTU): —	
Appearance: clear	
Analyses requested: PFAS x 18	
Comments: rocky bottom (boulders present, no fine sed's) inside fence	

Product Observed?	Yes	(No)	
Product Collected?	Yes	(No)	

Checked By:	MDN

SURFACE WATER SAMPLE LOG

Date: 10/22/20	Project: OME
Field Investigators: VTY / MDN	
Name of Water Body: SW-08	
Location of Water Body: N end of RW3-21, east side ditch b/w RW and ARNG hanger	
Type of Water Body: standing water in ditch	
Sample Location: surface water + sediment	
Sample Number: SW-08 SD-08	Sample Time: 1224 1226
Method of Collection: grab + solo cup for sed	
Temperature (°C): 1.1	
pH: 7.97	
Conductivity: 438.7	
DO (mg/l): 10.70	
Turbidity (NTU): —	
Appearance: clear	
Analyses requested: PFAS x 18	
Comments: 6 in deep; 1/4 in rec on top	

Product Observed?	Yes	(No)	
Product Collected?	Yes	(No)	

Checked By:	MDN

SURFACE WATER SAMPLE LOG

Date: 10/22/20 Project: 105745-002

Field Investigators: VTY/MDN

Name of Water Body: drainage ditch east of RW 3-21, north of taxiway ~~Juliet~~ and ARNG hangar

Location of Water Body: SW-09

Type of Water Body: standing water in drainage ditch

Sample Location: west side of ditch surface water + sed't

Sample Number: SW-09 ~~[illegible]~~ (VTY) Sample Time: 1240/1230

SD-09 ~~[illegible]~~ time: 1242/~~1232~~ (MDN)

Method of Collection: grab (no cup needed)

Temperature (°C): 1.4

pH: 7.90

Conductivity: 460.7

DO (mg/l): 9.60

Turbidity (NTU): visual

Appearance: clear

Analyses requested: PFAS x18

Comments: 1/4 inch ice, abundant vegetation sed't sample ~ 40% organics/roots shallow water, up to 6" deep

Product Observed?	Yes	(No)
Product Collected?	Yes	(No)

Checked By: MDN

SURFACE WATER SAMPLE LOG

Date: 10/22/20 Project: OHE

Field Investigators: VTY / MDN

Name of Water Body: SW-10

Location of Water Body:

Type of Water Body: creek in ditch

Sample Location: half way down west side of RW 3-21
surface water + sediment

Sample Number: SW-10/11 Sample Time: 1315 / 1305
SD-10/11 1320 / 1310

Method of Collection: grab

Temperature (°C): 0.5

pH: 7.49

Conductivity: 202.4

DO (mg/l): 12.00

Turbidity (NTU): -

Appearance: clear

Analyses requested: PFAS x18

Comments: foam observed ~ 75 ft., flowing south, unfrozen
~~bucket nearby~~ (no)

Product Observed?	Yes	No	
Product Collected?	Yes	No	

Checked By: MDN

SURFACE WATER SAMPLE LOG

Date: 10/22/20 Project: OHE

Field Investigators: VTY / MDN

Name of Water Body: SW-12

Location of Water Body: standing water on north side of intersection ~~(AWP)~~ of 10-28 and 3-21

Type of Water Body: pond on ditch ~~AWP~~

Sample Location: surface water + sed't

Sample Number: SW-12 Sample Time: 1345
SD-12 Time: 1346

Method of Collection: grab (no cup needed)

Temperature (°C): 1.3
pH: ~~7.6~~ 7.55
Conductivity: 234.4
DO (mg/l): 9.58
Turbidity (NTU): visual
Appearance: clear

Analyses requested: ~~PFAS~~ x18

Comments: ~~bare~~ slightly frozen ~1/4 inch @ edges
sed't dk brown, fine-grained ~~fee~~ plastic

Product Observed?	Yes	(No)	
Product Collected?	Yes	(No)	

Checked By: MDN

SURFACE WATER SAMPLE LOG

Date: 10/22/20	Project: OME
Field Investigators: VTY / MDN	
Name of Water Body: SW-13	
Location of Water Body: culvert S of ARFF building	
Type of Water Body: standing water in culvert	
Sample Location: end of culvert (inside of it)	
Sample Number: SW-13 SD-13	Sample Time: 1401 1402
Method of Collection: grab	
Temperature (°C): 5.7	
pH: 7.84	
Conductivity: 165.4	
DO (mg/l): 9.75	
Turbidity (NTU):	
Appearance: silty with some organics floating	
Analyses requested: PFAS x18	
Comments: Very fine-grained sed. settled from suspension. water was not flowing @ time of sampling	

Product Observed?	Yes	No
Product Collected?	Yes	No

Checked By: MDN

Water supply well field notes contain personal information.
This content has been removed for confidentiality.

MONITORING WELL CONSTRUCTION DETAILS

Monitoring Well No.	OME-MW01-15	Date Installed	10/26/20
Project Name	DOT&PF Statewide PFAS	Logged By	Adam Wyborny
Project Number	105745	Driller	GeoTek / Demetri

Near wind sock south of ARFF and north of runway 10-28

I. TOP SECTION (CASING)

Initial Pipe Length: 10
Cuttoff Length: 5.55
Add-on Length: —
Total Length 4.45

II. MID SECTION (CASING)

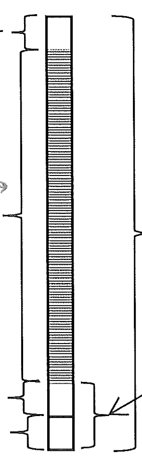
Number of Blank Sections:
Length of Section(s):

+

Sum of Lengths: —

III. SCREENED SECTION(S)

x 2



Joint Length: 0.15

Screened Length: 10.05 (~~4.85~~)

Joint Length: 0.20

End Cap Length: 0.30

Pointed ☒ Flat ☐

0.15 4.85 0.2 0.15 4.85

+

Total Pipe Length: 10.70

BOW to BOS: 0.50

=

TOC to BOW: 15.15

IV. WELL DATA

Pipe Type: PVC ☒ SS ☐ Other ____
Diameter: 2" ☒ 4" ☐ Other ____
Slot Size: 0.01 ☒ 0.02 ☐ Other ____
Joint Pin End: Up ☒ Down ☐ Type ____

V. BACKFILL

	Depth Below GS Bottom	Top
CEM (No Pipe)		
CEM_PB	0.7'	0.0'
*SLUF_PB/FIL_PB	3'	0.7'
BCH_PB	4'	3'
*SLUF_PB/FIL_PB		
BGR_PB		
*SLUF_PB/FIL_PB	5'	4'
*SLUF_PS/FIL_PS	15'	~~4~~ 5'
*SLUF/FIL (No Pipe)		
*SLUF_PB/FIL_PB	15.6'	15'

Filter Pack Type or Gradation: 10/20 Sand

VI. MONUMENTS

Stickup ☐ Flushmount ☒
TOM to GS: Flush
TOM to TOC: 0.45
^TOC to GS: 0.45 ~~0.45~~ ~~0.4~~
Lock type: N/A

VII. MOISTURE CONTENT

Depth to Water Below GS: 7.50 ft on 10/31

	Frozen Soil Below GS Bottom	Top
Seasonal 1		
Seasonal 2		
Permafrost 1		
Permafrost 2		

BCH = Bentonite Chips (gINT code)
BGR = Bentonite Grout (gINT code)
bgs = Below Ground Surface
BOS = Bottom of Screen
BOW = Bottom of Well
CEM = Cement (gINT code)
FIL = Sand Pack (gINT code)
GS = Ground Surface
SLUF = Natural Collapse/Pea Gravel (gINT code)
SS = Stainless Steel
TOC = Top of Casing
TOM = Top of Monument
TOS = Top of Screen
PB = Blank Pipe (gINT code)
PS = Slotted Pipe (gINT code)
* Circle filter-pack type
^ Flushmount = Negative Number
Stickup = Positive Number

VIII. CALCULATIONS BELOW GROUND SURFACE

TOC to BOW: 15.15
- BOW to BOS: 0.50
= TOC to BOS: 14.65

TOC to BOS: 14.65
- Screened Length: ~~4.9~~ 10.05
= TOC to TOS: ~~4.75~~ 4.60

TOC to BOW	15.15
- TOC to GS	-0.45
BOW bgs	15.60
TOC to TOS	~~4.75~~ 4.60
- TOC to GS	-0.45
TOS bgs	~~5.25~~ 5.05
TOC to BOS	14.65
- TOC to GS	-0.45
BOS bgs	15.10

MDN

MONITORING WELL CONSTRUCTION DETAILS

Monitoring Well No. OME-MW01-30
Project Name DOT&PF Statewide PFAS
Project Number 105745

South of ARFF, North of 10-28, near windsock

Date Installed 10/27/2020
Logged By Adam Wyberny
Driller GeoTek / Demetri

I. TOP SECTION (CASING)

Initial Pipe Length	10'
Cuttoff Length	6.39'
Add-on Length	
Total Length	3.61

II. MID SECTION (CASING)

Number of Blank Sections: 2

Length of Section(s):

10'	10'	

+

Sum of Lengths: 20'

III. SCREENED SECTION(S)

Joint Length: 0.15

Screened Length: 4.85

+

Total Pipe Length: 5.50

Joint Length: 0.20

End Cap Length: 0.30

Pointed ☒ Flat ☐

BOW to BOS: 0.50

=

TOC to BOW: 29.11

IV. WELL DATA

Pipe Type: PVC ☒ SS ☐ Other
Diameter: 2" ☒ 4" ☐ Other
Slot Size: 0.01 ☒ 0.02 ☐ Other
Joint Pin End: Up ☒ Down ☐ Type

V. BACKFILL

	Depth Below GS Bottom	Top
CEM (No Pipe)		
CEM_PB	0.7'	0.0'
*SLUF_PB/FIL_PB	5'	0.7'
BCH_PB	23'	5'
*SLUF_PB/FIL_PB		
BGR_PB		
*SLUF_PB/FIL_PB	24.3	23'
*SLUF_PS/FIL_PS	~~29.6~~	~~24.3~~
*SLUF/FIL (No Pipe)		
*SLUF_PB/FIL_PB	30'	29'

Filter Pack Type or Gradation: 10/20 Sand

VI. MONUMENTS

Stickup ☐ Flushmount ☒

TOM to GS: Flush
TOM to TOC: 0.52
^TOC to GS: 0.52
Lock type: N/A

VII. MOISTURE CONTENT

Depth to Water Below GS: 6.87 ft on 10/31

	Frozen Soil Below GS Bottom	Top
Seasonal 1		
Seasonal 2		
Permafrost 1		
Permafrost 2		

BCH = Bentonite Chips (gINT code)
BGR = Bentonite Grout (gINT code)
bgs = Below Ground Surface
BOS = Bottom of Screen
BOW = Bottom of Well
CEM = Cement (gINT code)
FIL = Sand Pack (gINT code)
GS = Ground Surface
SLUF = Natural Collapse/Pea Gravel (gINT code)
SS = Stainless Steel
TOC = Top of Casing
TOM = Top of Monument
TOS = Top of Screen
PB = Blank Pipe (gINT code)
PS = Slotted Pipe (gINT code)
* Circle filter-pack type
^ Flushmount = Negative Number
Stickup = Positive Number

VIII. CALCULATIONS BELOW GROUND SURFACE

TOC to BOW 29.11
- BOW to BOS 0.50
= TOC to BOS 28.61

TOC to BOS 28.61
- Screened Length 4.85
= TOC to TOS 23.76

TOC to BOW	29.11
- TOC to GS	-0.52
BOW bgs	~~28.59~~ 29.63
TOC to TOS	23.76
- TOC to GS	-0.52
TOS bgs	~~23.24~~ 24.28
TOC to BOS	28.61
- TOC to GS	-0.52
BOS bgs	~~28.09~~ 29.13

MDN

MONITORING WELL CONSTRUCTION DETAILS

Monitoring Well No. OME-MW02-15 by taxiway H
Project Name DOT & PF Statewide PFAS near ARFF
Project Number 105745

Date Installed 10/26/2020
Logged By Adam Wyberny
Driller GeoTek / Demetri

I. TOP SECTION (CASING)

Initial Pipe Length 10
Cuttoff Length 6.33
Add-on Length —
Total Length 3.67

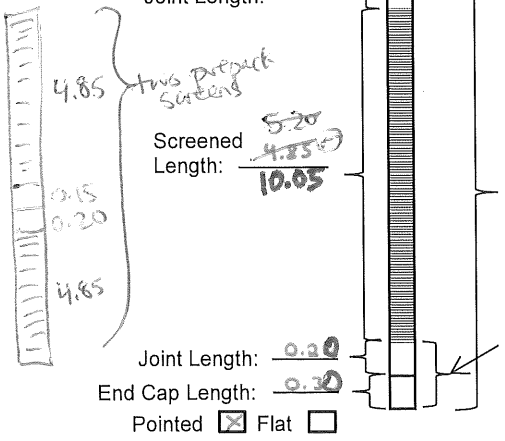
II. MID SECTION (CASING)

Number of Blank Sections —
Length of Section(s):

+

Sum of Lengths: —

III. SCREENED SECTION(S) x 2



+

=

TOC to BOW: 14.37

IV. WELL DATA

Pipe Type: PVC ☒ SS ☐ Other
Diameter: 2" ☒ 4" ☐ Other
Slot Size: 0.01 ☒ 0.02 ☐ Other
Joint Pin End: Up ☒ Down ☐ Type

V. BACKFILL

	Depth Below GS Bottom	Top
CEM (No Pipe)		
CEM_PB	0.8'	0.0'
*SLUF_PB/FIL_PB	2.5'	0.8'
BCH_PB	~~3~~ 3.5'	2.5'
*SLUF_PB/FIL_PB		
BGR_PB		
*SLUF_PB/FIL_PB	4.3'	3.5'
*SLUF_PS/FIL_PS	~~15~~ 14.3'	4.3'
*SLUF/FIL (No Pipe)		
*SLUF_PB/FIL_PB	15'	14.3'

Filter Pack Type or Gradation 10/20 Sand

VI. MONUMENTS

Stickup ☐ Flushmount ☒

TOM to GS Flush
TOM to TOC 0.42
^TOC to GS 0.42
Lock type N/A

VII. MOISTURE CONTENT

Depth to Water Below GS 8.85' on 10/31

	Frozen Soil Below GS Bottom	Top
Permafrost Seasonal 1	unk	15ft
Seasonal 2	—	—
Permafrost 1	—	—
Permafrost 2	—	—

BCH = Bentonite Chips (gINT code)
BGR = Bentonite Grout (gINT code)
bgs = Below Ground Surface
BOS = Bottom of Screen
BOW = Bottom of Well
CEM = Cement (gINT code)
FIL = Sand Pack (gINT code)
GS = Ground Surface
SLUF = Natural Collapse/Pea Gravel (gINT code)
SS = Stainless Steel
TOC = Top of Casing
TOM = Top of Monument
TOS = Top of Screen
PB = Blank Pipe (gINT code)
PS = Slotted Pipe (gINT code)
* Circle filter-pack type
^ Flushmount = Negative Number
Stickup = Positive Number

VIII. CALCULATIONS BELOW GROUND SURFACE

TOC to BOW 14.37
- BOW to BOS 0.50
= TOC to BOS 13.87

TOC to BOS 13.87
- Screened Length ~~4.9~~ 10.05
= TOC to TOS ~~3.47~~ 3.82

TOC to BOW	14.37
- TOC to GS	-0.42
BOW bgs	14.79
TOC to TOS	~~2.11~~ 3.82
- TOC to GS	-0.42
TOS bgs	~~4.53~~ 4.24
TOC to BOS	13.87
- TOC to GS	-0.42
BOS bgs	14.29

MDW

WELL DEVELOPMENT LOG

Owner-Client: DOT & PF
Location: OME
Weather: Partly cloudy 23°F
Development Personnel: APW

Well No.: OME-MW01-15
Project No: 105745
Date: 10/29/20 - 10/30/20

Diameter and Type of Casing: 2" PVC Casing
Total Depth of Well **Before** Development (feet below top of casing): 14.39
Depth to Water **Before** Development (feet below top of casing): 7.08
Depth to Screen Top and Bottom (from Construction Log): Top: ~~4.78~~ 5.05 Bottom: ~~0.5~~ 15.10

Development Details

Feet of water in well: 7.31
Gallons per foot: 0.17
Gallons in well: 1.24
Surge method: ~~Surge Block~~ (not v. little) occasional surge
Pump used: Waterra Pump
Tubing used (ft): ~25'

Time pumping started: 14:30 on 10/29 and 18:00 on 10/30
Flow rate (gal/min): ~0.3
Flow-rate measurement method: Bucket
Time pumping ended: 20:00
Gallons Pumped: ~140
Disposal: GAC Treatment

Depth to Water **After** Development (feet below top of casing): 7.05
Total Depth of Well **After** Development (feet below top of casing): 14.56

Observations

10/29

Time	Water Clarity (Visual)
14:30	Silty slurry
15:15	|
15:45	|
16:15	|
17:00	|
17:30	|
18:00	|
19:00	|
19:30	|
20:00	✓

10/30

Time	Water Clarity (Visual)
18:00	very turbid
18:30	turbid
19:00	|
19:30	✓
20:00	slightly turbid

NOTES: Very silty water. Varied purge rate, and depth of waterra, ~~eventually obs~~ minimal change in turbidity

WELL CASING VOLUMES

Diameter of Well [ID-inches]	1¼	2	3	4	6	8
Gallons per lineal foot	0.08	0.17	0.38	0.66	1.5	2.6

MDN

WELL DEVELOPMENT LOG

Owner-Client: DOT & PF
Location: OME
Weather: Partly Cloudy 15°F
Development Personnel: APW

Well No.: OME-MW01-30
Project No: 105745-002
Date: 10/31/2020

Diameter and Type of Casing: 2" PVC casing
Total Depth of Well **Before** Development (feet below top of casing): 28.67
Depth to Water **Before** Development (feet below top of casing): 6.37
Depth to Screen Top and Bottom (from Construction Log): Top: ~~23.76~~ 24.23 Bottom: ~~29.5~~ 29.13

Development Details

Feet of water in well: 22.30
Gallons per foot: 0.17
Gallons in well: 3.79
Surge method: Waterra w/ foot valve, occasional surge block
Pump used: Waterra Pump
Tubing used (ft): ~45

Time pumping started: 11:15
Flow rate (gal/min): ~0.25 - 0.3
Flow-rate measurement method: Bucket
Time pumping ended: 13:45
Gallons Pumped: ~50
Disposal: GAC treatment

Depth to Water **After** Development (feet below top of casing): 6.35
Total Depth of Well **After** Development (feet below top of casing): 28.79

Observations

Time	Water Clarity (Visual)
11:15	Silty Slurry
11:30	↓
11:45	↓
12:00	↓
12:15	very Turbid
12:30	↓
12:45	↓
13:00	Turbid
13:15	↓
13:30	↓

Time	Water Clarity (Visual)
13:45	slightly turbid

NOTES:

WELL CASING VOLUMES

Diameter of Well [ID-inches]	1¼	2	3	4	6	8
Gallons per lineal foot	0.08	0.17	0.38	0.66	1.5	2.6

MDN

WELL DEVELOPMENT LOG

Owner-Client	DOT & PF	Well No.	OME-MW02-15
Location	OME	Project No	105745
Weather	Partly Cloudy	Date	10/30/2020
Development Personnel	APW		

Diameter and Type of Casing: 2" PVC Casing

Total Depth of Well **Before** Development (feet below top of casing): 13.96'

Depth to Water **Before** Development (feet below top of casing): 8.44'

Depth to Screen Top and Bottom (from Construction Log): Top: ~~3.97~~ [illegible] 4.24 Bottom: ~~0.5~~ [illegible] 14.29

Development Details

Feet of water in well	5.52	Time pumping started	12:30
Gallons per foot	0.17	Flow rate (gal/min)	~0.25
Gallons in well	0.94	Flow-rate measurement method:	Bucket
Surge method	Waterra foot valve w/ occasional Surge Block		
Pump used	Waterra Pump	Time pumping ended	17:45
Tubing used (ft)	~45	Gallons Pumped	~50
		Disposal:	GAC Treatment

Depth to Water **After** Development (feet below top of casing): 8.43'

Total Depth of Well **After** Development (feet below top of casing): 14.00'

Observations

Time	Water Clarity (Visual)
12:30	Silty slurry
12:50	↓
13:10	↓
Pause	- change tubing
14:10	Silty slurry
14:30	↓
14:45	↓
15:00	↓
15:15	↓
Pause	- refuel generator

Time	Water Clarity (Visual)
15:45	Very Turbid
16:00	↓
16:15	↓
16:30	↓
16:45	Turbid
17:00	↓
17:15	↓
17:30	↓
17:45	slightly turbid

NOTES:

WELL CASING VOLUMES

Diameter of Well [ID-inches]	1¼	2	3	4	6	8
Gallons per lineal foot	0.08	0.17	0.38	0.66	1.5	2.6

MDN

MONITORING WELL SAMPLING LOG

Owner/Client: DOT - OME
Location: south end of 3-21
Sampling Personnel: VTT, MDN
Weather Conditions: clear Air Temp. (°F): low 30's

Project No.: 105745-002
Date: 10/24/20
Well: 3-21-TWP-04
Time started: 1745
Time completed: 1900

Sample No.: 3-21-TWP-04 ~~05~~ DUP Time: 1839
Duplicate: 3-21-TWP-05 Time: 1829
Equipment Blank: — Time: —

Pump: peri
Purging Method: portable / dedicated pump
Pumping Start: ~~1805~~
Purge Rate (gal./min.): 0.13
Pumping End: 1840

Pump Set Depth Below MP (ft.): 11
KuriTec Tubing (ft.): 10
TruPoly Tubing (ft.): 20

Diameter and Type of Casing: 1 1/4" metal+PVC
Approximate Total Depth of Well Below MP (ft.): —
Measured Total Depth of Well Below MP (ft.): ~13ft
Depth to Water Below MP (ft.): ~10ft
Depth to Ice (if frozen) Below MP (ft.): —
Feet of Water in Well: ~3ft
Gallons per foot: 0.08
Gallons in Well: 0.24
Purge Water Volume (gal.): 4.55
Purge Water Disposal: GAC onsite

Monument Condition: n/a, TWP (metal casing PVC screen)

Casing Condition: n/a

Wiring Condition (dedicated pumps): n/a

Measuring Point (MP): Top of Casing (TOC)
Monument type: Stickup / Flushmount
Measurement method: Rod & level / Tape measure

Top-of-casing to monument (ft.): —
Monument to ground surface (ft.): 2.84

Datalogger type: n/a
Datalogger serial #: n/a
Measured cable length (ft.): n/a

- ☐ Lock present and operational
- ☐ Well name legible on outside of well
- ☐ Evidence of frost-jacking

n/a

Notes: water sounder inoperable, dtw imprecise

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	2	3	4	6	8
Gallons per lineal foot	0.000253	0.08	0.17	0.38	0.66	1.5	2.6

MDN

3-21-TWP-04
Well No.

MONITORING WELL SAMPLING LOG

Field Parameter Instrument: YSI F Circle one: *Parameters stabilized or >3 well volumes purged*

Sample Observations: none

Notes: metal SP and PVC screen

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C) [± 3%]	Dissolved Oxygen (mg/L) [±10%]	Conductivity (µS/cm) [± 3%]	pH [± 0.1]	ORP (mV) [± 10 mV]	Water Clarity (visual)
1805	pump on, drop from base of the screen					v. turbid
1808	pull up to middle of screen					sl. turbid
1814	6.3	0.23	4178	6.96	44.7	clear
1817	6.3	0.13	4179	6.97	25.4	"
1820	6.3	0.08	4146	6.99	8.1	"
1823	6.3	0.05	4180	7.01	-7.5	"
1826	6.3	0.05	4189	7.02	-15.3	"
1829	6.3	0.04	4195	7.02	-20.2	"
1832	6.3	0.04	4196	7.03	-26.5	"
1835	6.3	0.04	4195	7.03	-30.3	"
1838	6.3	0.04	4191	7.04	-34.3	"
1839	sample					

Laboratory ~~SGS~~ TestAmerica/Eurofins

	Analysis	Sample Containers	Preservatives	Dup
X	PFAS x18	2x 250 mL	—	X
☐				☐
☐				☐
☐				☐
☐				☐
☐				☐

MDN

3-21-TWP-04

Well No.

MONITORING WELL SAMPLING LOG

Owner/Client: OME
Location: South of ARNG hangar
Sampling Personnel: VH/MDN
Weather Conditions: ~~30s/mid 30s~~ light snow to overcast Air Temp. (°F): mid 30s

Project No.: 105745-002
Date: ~~10~~ 10/27/20
Well: ANG-TWP01
Time started: 1700
Time completed: 1830

Sample No.: ANG-TWP01-01 Time: 1802
Duplicate: ANG-TWP~~02~~02-02 Time: 1812
Equipment Blank: — Time: —

Pump: peristaltic TTT
Purging Method: *portable* / *dedicated* *pump*
Pumping Start: 1716
Purge Rate (gal./min.): 0.13 gpm
Pumping End: 1817

Pump Set Depth Below MP (ft.): ~~17.7 ft~~ → 13-14 ft bgs
peri → KuriTec Tubing (ft.): ~~35 ft~~ (HH)
TruPoly Tubing (ft.): ~~XX~~ 35

Diameter and Type of Casing: 1" ~~PVC~~ SP sampler TWP
Approximate Total Depth of Well Below MP (ft.): —
Measured Total Depth of Well Below MP (ft.): ~~17.22~~ 22.70
Depth to Water Below MP (ft.): 17.30
Depth to Ice (if frozen) Below MP (ft.): —
Feet of Water in Well: 5.4
Gallons per foot: 0.08
Gallons in Well: 0.43
Purge Water Volume (gal.): ~8 gal
Purge Water Disposal: GAC (x3 5 gal) onsite

Monument Condition: N/A, TWP (metal/steel casing w/ PVC screen)

Casing Condition: N/A

Wiring Condition (dedicated pumps): N/A

Measuring Point (MP): *Top of Casing (TOC)*

Monument type: *Stickup* / *Flushmount*
Measurement method: *Rod & level* / *Tape measure*

Top-of-casing to monument (ft.): —
Monument to ground surface (ft.): 4.05

Datalogger type: n/a
Datalogger serial #: n/a
Measured cable length (ft.): n/a

- ☐ Lock present and operational
- ☐ Well name legible on outside of well
- ☐ Evidence of frost-jacking N/A

Notes: Metal SP16 sampler ~~recently decon'd~~ w/ disposable screen

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	2	3	4	6	8
Gallons per lineal foot	0.000253	0.08	0.17	0.38	0.66	1.5	2.6

22.70
17.60
MDN

ANG-TWP01
Well No.

MONITORING WELL SAMPLING LOG

Field Parameter Instrument YSI F Circle one: *Parameters stabilized or >3 well volumes purged*

Sample Observations fuel/diesel odor

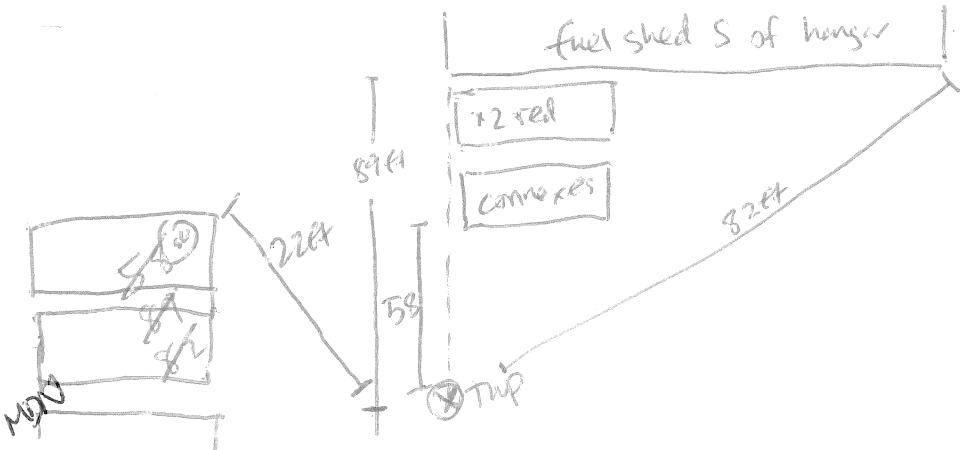
Notes

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C) [± 3%]	Dissolved Oxygen (mg/L) [±10%]	Conductivity (µS/cm) [± 3%]	pH [± 0.1]	ORP (mV) [± 10 mV]	Water Clarity (visual)
1716	pump on	high speed				v. turbid to turbid
1725						turbid
1730	3.6	2.40	1493	6.58	126.7	clear / sulfur smell
1733	3.5	0.73	1496	6.58	71.9	
1736	3.5	0.50	1506	6.59	38.6	
1739	3.5	0.40	1510	6.60	20.5	
1742	3.5	0.40	1510	6.62	9.0	
1746	3.5	0.30	1510	6.63	-2.0	
1749	3.5	0.18	1512	6.64	-7.5	
1752	3.5	0.11	1514	6.64	-13.5	
1755	3.5	0.12	1514	6.64	-18.6	
1758	3.5	0.11	1517	6.65	-23.3	
1801	3.5	0.11	1514	6.65	-27.6	
1817	pump stop					

Laboratory ~~SGS~~ Test Am + SGS

Analysis	Sample Containers	Preservatives	Dup
☒ PFAS x18	x2 250mL	None	☒
☒ ~~VOCs~~ / GRO / BTEX (MAY)	x3 VOAs	HCl	☒
☒ DRO / DRO	x2 250mL Amber	HCl	☒
☐			☐
☐			☐
☐			☐



Well No. ANG-TWP01

MONITORING WELL SAMPLING LOG

Owner/Client DOT&PF / JMT
Location West end RW 10-28
Sampling Personnel VTY / MDN
Weather Conditions ~~upper 30s~~ 5 cloudy / overcast Air Temp. (°F) upper 30s

Project No. 105745-002
Date 10/25/20
Well 10-28-TWP-02
Time started 1045
Time completed 1145

Sample No. 10-28-TWP-02 Time 1139
Duplicate — Time —
Equipment Blank — Time —

Pump Peristaltic
Purging Method (portable / dedicated) pump
Pumping Start 1108
Purge Rate (gal./min.) 0.13
Pumping End 1140

Pump Set Depth Below MP (ft.) 9.5 @ 11 ft
KuriTec Tubing (ft.) —
TruPoly Tubing (ft.) 15

Diameter and Type of Casing 1" PVC TWP
Approximate Total Depth of Well Below MP (ft.) —
Measured Total Depth of Well Below MP (ft.) ~~12.77~~ @ 13.05
Depth to Water Below MP (ft.) 10.28
Depth to Ice (if frozen) Below MP (ft.) —
Feet of Water in Well ~~3.33~~ 3.77
Gallons per foot 0.08
Gallons in Well ~~0.27~~ 0.22
Purge Water Volume (gal.) ~ 4.16
Purge Water Disposal GAC onsite (x3 in two)

Monument Condition N/A, TWP

Casing Condition N/A, TWP

Wiring Condition (dedicated pumps) N/A

Measuring Point (MP) Top of Casing (TOC)

Monument type: Stickup / Flushmount
Measurement method: Rod & level / Tape measure

Top-of-casing to monument (ft.) —
Monument to ground surface (ft.) 0.06

Datalogger type n/a
Datalogger serial # n/a
Measured cable length (ft.) n/a

N/A
- ☐ Lock present and operational
- ☐ Well name legible on outside of well
- ☐ Evidence of frost-jacking

Notes ~~drawn~~ sample from ~6" below top of water (11.05 below TOC) measured using tubing

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	2	3	4	6	8
Gallons per lineal foot	0.000253	0.08	0.17	0.38	0.66	1.5	2.6

measure ~~11.05~~ MDN 13.05

10-28-TWP-02
Well No.

MONITORING WELL SAMPLING LOG

Field Parameter Instrument YSI F Circle one: Parameters stabilized or >3 well volumes purged

Sample Observations —

Notes —

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C) [± 3%]	Dissolved Oxygen (mg/L) [±10%]	Conductivity (µS/cm) [± 3%]	pH [± 0.1]	ORP (mV) [± 10 mV]	Water Clarity (visual)
1108	start	purge				v. turbid for nipple
1110						sl. turbid
1113	switch	to YSI, pull	up			
1114	3.8	0.37	630	6.73	83.1	sl. turbid
1117	3.7	0.24	625	6.76	53.0	clear
1120	3.7	0.12	623	6.82	27.6	"
1123	3.7	0.12	623	6.84	16.6	"
1126	3.7	0.13	624	6.85	11.1	"
1129	3.7	0.15	624	6.86	7.2	"
1132	3.7	0.17	626	6.86	3.2	"
1135	3.7	0.17	626	6.87	4.5	"
1138	3.7	0.17	626	6.87	-0.8	"
1139	sample					

Laboratory SGS Test Am

	Analysis	Sample Containers	Preservatives	Dup
☒	PFAS x18	x2 250mL	None	☐
☐				☐
☐				☐
☐				☐
☐				☐
☐				☐

~~1225 Drill base~~ ~~truck to escort~~

MDN

10-28-TWP-02

Well No.

MONITORING WELL SAMPLING LOG

Owner/Client DTAPF OME
Location east end RW 10-28 next to Foxtrot
Sampling Personnel VTY/MDN
Weather Conditions overcast Air Temp. (°F) 30s

Project No. 105745-002
Date 10/25/20
Well 10-28-TWP-05
Time started 1410
Time completed 1520

Sample No. 10-28-TWP-05 Time 1503
Duplicate 10-28-TWP-06 Time 1453
Equipment Blank — Time —

Pump peristaltic TTT
Purging Method portable / dedicated pump
Pumping Start 1421
Purge Rate (gal./min.) 0.13 gpm
Pumping End 1505

Pump Set Depth Below MP (ft.) ~~~13.3 ft~~ ~~~9.86 ft~~ ~9.3 ft
KuriTec Tubing (ft.) ~~18 ft~~
TruPoly Tubing (ft.) ~~0 ft~~ 18
per

Diameter and Type of Casing 1" PVC TWP
Approximate Total Depth of Well Below MP (ft.) —
Measured Total Depth of Well Below MP (ft.) 13.84
Depth to Water Below MP (ft.) 8.85
Depth to Ice (if frozen) Below MP (ft.) —
Feet of Water in Well 4.99
Gallons per foot 0.08
Gallons in Well 0.40
Purge Water Volume (gal.) ~5 gal
Purge Water Disposal GAC onsite

Monument Condition N/A

Casing Condition N/A

Wiring Condition (dedicated pumps) N/A

Measuring Point (MP) *Top of Casing (TOC)*

Monument type: *Stickup* / *Flushmount*
Measurement method: *Rod & level* / *Tape measure*

Top-of-casing to monument (ft.) —
Monument to ground surface (ft.) ~~1.15~~ 0.11

Datalogger type n/a
Datalogger serial # n/a
Measured cable length (ft.) n/a

N/A
- ☐ Lock present and operational
- ☐ Well name legible on outside of well
- ☐ Evidence of frost-jacking

Notes pump @ speed 13.7 = 0.13 gpm when clear

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	2	3	4	6	8
Gallons per lineal foot	0.000253	0.08	0.17	0.38	0.66	1.5	2.6

MDN

Well No. 10-28-TWP-05

MONITORING WELL SAMPLING LOG

Field Parameter Instrument YSI F   Circle one: *Parameters stabilized* or *>3 well volumes purged*
Sample Observations —
Notes —

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C) [± 3%]	Dissolved Oxygen (mg/L) [±10%]	Conductivity (µS/cm) [± 3%]	pH [± 0.1]	ORP (mV) [± 10 mV]	Water Clarity (visual)
1421	pump on					V. turbid w/ sed
1422	clogged; fine sand and silt					
1428	re-start pump after cleaning sed't, pull up 2 ft					
1429						V. turbid
1432	agitate in top 1 ft of screen					~~clear~~ Sl. turbid
~~1435~~						~~V. turbid~~
1439	4.7	0.54	1033	6.70	100.8	clear
1445	4.8	0.24	1037	6.73	33.7	"
1448	4.8	0.20	1037	6.74	22.4	"
1451	4.8	0.18	1037	6.74	15.7	"
1454	4.8	0.13	1037	6.74	6.5	"
1457	4.8	0.12	1037	6.74	3.1	"
1500	4.8	0.12	1036	6.75	-1.0	"
1503	sample					

Laboratory ~~SGS~~ Test Am

	Analysis	Sample Containers	Preservatives	Dup
☑	PFAS x18	x2 250 mL	None	☒
☐				☐
☐				☐
☐				☐
☐				☐
☐				☐

~~9.90 water~~ ~~or sampled~~
9.24 water ~~or sampled~~

MDN

10-28-TWP-05
Well No.

MONITORING WELL SAMPLING LOG

Owner/Client: OME
Location: West of RW 10-28/3-21 junction, NW of pappi shack
Sampling Personnel: VTY/MDN
Weather Conditions: clear/sunny, windy Air Temp. (°F):

Project No.: 105745-002
Date: 10/26/20
Well: 10-28-TWP-07
Time started: 1600
Time completed: 1715

Sample No.: 10-28-TWP-07 Time: 1705
Duplicate: 10-28-TWP-08 Time: 1710
Equipment Blank: — Time: —

Pump: Peristalic pump TT
Purging Method: *portable / dedicated* pump
Pumping Start: 1617
Purge Rate (gal./min.): 0.13 gpm
Pumping End: 1710

Pump Set Depth Below MP (ft.): 7.8
per: KuriTec Tubing (ft.): ~~17~~
TruPoly Tubing (ft.): ~~17~~ 17

Diameter and Type of Casing: 1" PVC TWP
Approximate Total Depth of Well Below MP (ft.): —
Measured Total Depth of Well Below MP (ft.): 14.16
Depth to Water Below MP (ft.): 6.21
Depth to Ice (if frozen) Below MP (ft.): —
Feet of Water in Well: ~~0.08~~ 7.95
Gallons per foot: 0.08
Gallons in Well: 0.64
Purge Water Volume (gal.): ~7 gallons
Purge Water Disposal: GAC to onsite

Monument Condition: N/A TWP

Casing Condition: N/A

Wiring Condition (dedicated pumps): N/A

Measuring Point (MP): *Top of Casing (TOC)*
Monument type: *Stickup* / *Flushmount*
Measurement method: *Rod & level* / *Tape measure*

Top-of-casing to monument (ft.): —
Monument to ground surface (ft.): 0.03

Datalogger type: n/a
Datalogger serial #: n/a
Measured cable length (ft.): n/a

- ☐ Lock present and operational
- ☐ Well name legible on outside of well
- ☐ Evidence of frost-jacking: N/A

Notes: Water sampler inoperable; measure using tubing

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	2	3	4	6	8
Gallons per lineal foot	0.000253	0.08	0.17	0.38	0.66	1.5	2.6

MDN

10-28-TWP-07
Well No.

MONITORING WELL SAMPLING LOG

Field Parameter Instrument YSI F Circle one: *Parameters stabilized or >3 well volumes purged*

Sample Observations _____

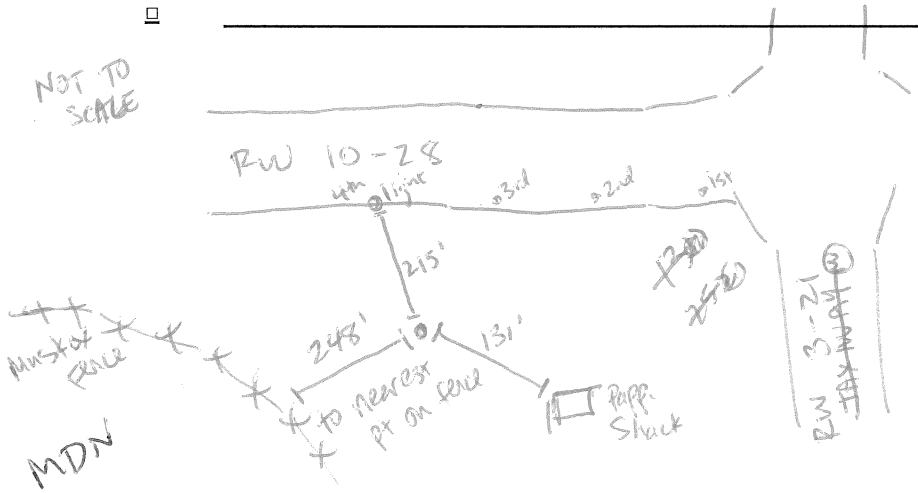
Notes water sounder malfunctioning

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C) [± 3%]	Dissolved Oxygen (mg/L) [±10%]	Conductivity (µS/cm) [± 3%]	pH [± 0.1]	ORP (mV) [± 10 mV]	Water Clarity (visual)
1617	pump start					V. turbid, some sand
1620						Sl. turbid
1625	use pump to find water depth			purge ~2 gallons		clear
1629	begin YSI readings					
1630	13.4	0.42	3890	7.01	162.7	clear
1633	3.5	0.43	3934	6.93	126.3	"
1636	3.5	0.43	3943	6.93	104.5	"
1639	3.5	0.44	3938	6.94	88.5	"
1642	3.5	0.43	3940	6.94	76.7	"
1645	3.5	0.43	3956	6.95	63.1	"
1648	3.5	0.43	3947	6.95	50.0	"
1651	3.5	0.43	3920	6.94	42.4	"
1654	3.5	0.43	3916	6.96	33.2	"
1657	3.5	0.43	3922	6.47	26.3	"
1700	3.5	0.43	3927	6.97	22.4	"
1703	3.5	0.43	3912	6.98	16.6	"

Laboratory ~~SGS~~ Test America

	Analysis	Sample Containers	Preservatives	Dup
☒	PFAS x18	2 250mL	None	☐
☐				☐
☐				☐
☐				☐
☐				☐
☐				☐



10-28-TWP-07
Well No.

MONITORING WELL SAMPLING LOG

Owner/Client: OME
Location: south of City of Nome landfill, N of RW 3-21
Sampling Personnel: VTY/MDN
Weather Conditions: clear Air Temp. (°F): low 30s

Project No.: 105745-002
Date: 10/26/20
Well: LNDFL-TWP-01
Time started: 1210
Time completed: 1420

Sample No.: LNDFL-TWP-01 Time: 1305
Duplicate: — Time: —
Equipment Blank: — Time: —

Pump: Peristaltic TFT
Purging Method: *portable* / *dedicated* *pump*
Pumping Start: 1220
Purge Rate (gal./min.): 0.02
Pumping End: 1400

Pump Set Depth Below MP (ft.): ~7.1 ft
~~KuriTec~~ Tubing (ft.): —
TruPoly Tubing (ft.): ~~XXX~~ 15

Diameter and Type of Casing: 1" PVC TWP
Approximate Total Depth of Well Below MP (ft.): —
Measured Total Depth of Well Below MP (ft.): 9.60
Depth to Water Below MP (ft.): 6.24
Depth to Ice (if frozen) Below MP (ft.): —
Feet of Water in Well: 3.36
Gallons per foot: 0.08
Gallons in Well: 0.27
Purge Water Volume (gal.): 2
Purge Water Disposal: GAC onsite

Monument Condition: N/A, TWP
Casing Condition: N/A
Wiring Condition (dedicated pumps): N/A

Measuring Point (MP): *Top of Casing (TOC)*
Monument type: *Stickup* / *Flushmount*
Measurement method: *Rod & level* / *Tape measure*

Top-of-casing to monument (ft.): N/A
Monument to ground surface (ft.): 0.99

Datalogger type: n/a
Datalogger serial #: n/a
Measured cable length (ft.): n/a

N/A
- ☐ Lock present and operational
- ☐ Well name legible on outside of well
- ☐ Evidence of frost-jacking

9.60 − 2.5 = 7.1

Notes: v. slow recharge

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	2	3	4	6	8
Gallons per lineal foot	0.000253	0.08	0.17	0.38	0.66	1.5	2.6

MDN

LNDFL-TWP-01
Well No.

MONITORING WELL SAMPLING LOG

Field Parameter Instrument: YSI F — Circle one: Parameters stabilized (circled) or >3 well volumes purged

Sample Observations: —

Notes: bubbles in line, slow recharge

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C) [± 3%]	Dissolved Oxygen (mg/L) [±10%]	Conductivity (µS/cm) [± 3%]	pH [± 0.1]	ORP (mV) [± 10 mV]	Water Clarity (visual)
1220 pump on						v. turbid
Purge ~3 gallons w/ lots of bubbles, sed't						sl. turbid
1305 begin YSI readings						
1310	2.7	15.04	592	6.68	42.0	silty
1313	2.7	0.49	592	6.74	47.0	turned down flow rate
1316	2.7	2.14	592	6.66	61.0	↓ again (speed 5.5)
1319	2.6	1.23	594	6.66	59.4	sl. turbid
1322	2.6	2.20	592	6.65	59.3	"
1325	2.6	~~1~~ 2.34	594	6.64	62.1	"
1328	~~2.6~~ turn down again (3.2 speed), now steady flow					
1331	2.6	7.60	594	6.600	64.2	"
1334	2.6	4.95	596	6.64	36.0	"
1338	2.6	2.06	594	6.65	20.1	"
1341	2.6	1.26	592	6.65	16.2	"
1344	2.6	1.36	592	6.64	15.4	"
1347	2.6	1.26	592	6.64	14.0	"
1350 sample						

Laboratory: SGS Test Am

	Analysis	Sample Containers	Preservatives	Dup
☒	PFAS x18	2 250mL	None	☐
☐				☐
☐				☐
☐				☐
☐				☐
☐				☐

~~9/30 11.02 11.16 11.40 12.05 11.35 3.11 3.45 1.42~~

LNDFL-TWP-01

Well No.

MDN

MONITORING WELL SAMPLING LOG

Owner/Client: OME
Location: gravel pit North of RW 10-28
Sampling Personnel: VTY/MDN
Weather Conditions: low (MP 3) Et overcast Air Temp. (°F): low 30s

Project No.: 105745-002
Date: 10/27/20
Well: GP-TWP-01
Time started: 1940
Time completed: 2135 55 (VTY)

Sample No.: GP-TWP-01 Time: 2116
Duplicate: — Time: —
Equipment Blank: — Time: —

Pump: Peristaltic TFT
Purging Method: *portable / dedicated* pump
Pumping Start: 1953
Purge Rate (gal./min.): ~~0.13~~ 0.013
Pumping End: 2130 45 (VTY)

Pump Set Depth Below MP (ft.): —
per: KuriTec Tubing (ft.): 18ft
TruPoly Tubing (ft.): —

Diameter and Type of Casing: 2" PVC TWP
Approximate Total Depth of Well Below MP (ft.): —
Measured Total Depth of Well Below MP (ft.): 14.49
Depth to Water Below MP (ft.): 6.49
Depth to Ice (if frozen) Below MP (ft.): —
Feet of Water in Well: 8.00 Et
Gallons per foot: 0.08
Gallons in Well: 0.64
Purge Water Volume (gal.): ~1.5
Purge Water Disposal: GAC (x3 5 gall) and release onsite

Monument Condition: N/A, TWP
Casing Condition: N/A
Wiring Condition (dedicated pumps): N/A

Measuring Point (MP): *Top of Casing (TOC)*
Monument type: *Stickup / Flushmount*
Measurement method: *Rod & level / Tape measure*

Top-of-casing to monument (ft.): —
Monument to ground surface (ft.): 1.00

Datalogger type: ~~n/a~~
Datalogger serial #: n/a
Measured cable length (ft.): n/a

N/A
☐ Lock present and operational
☒ Well name legible on outside of well
☐ Evidence of frost-jacking N/A

Notes: V. Slow recharge

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	2	3	4	6	8
Gallons per lineal foot	0.000253	0.08	0.17	0.38	0.66	1.5	2.6

MDN

GP-TWP-01
Well No.

MONITORING WELL SAMPLING LOG

Field Parameter Instrument YSI F Circle one: *Parameters stabilized* (circled) or *>3 well volumes purged*

Sample Observations silty water

Notes v. slow recharge

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C) [± 3%]	Dissolved Oxygen (mg/L) [±10%]	Conductivity (µS/cm) [± 3%]	pH [± 0.1]	ORP (mV) [± 10 mV]	Water Clarity (visual)
1955	start pump					v. turbid
1958						turbid
1959	slow recharge, slow to 1.2 speed					
2004	pump off, cycle a few times, allow to recharge					
2021	steady stream @ speed 1.3 = ~38 mL/min					v. turbid
2030						turbid
2040	turn up speed 1.85 ~~10~~ 250mL/5mins = 50 mL/min					sl. turbid
2050	connect YSI					turbid
2054	3.2	6.83	1609	6.79	101.0	"
2058	3.2	7.40	1602	6.79	87.2	" w/ bubbles
2104	2.8	7.70	1591	6.80	80.9	"
2107	2.7	7.77	1586	6.80	80.5	"
2110	2.6	8.00	1583	6.81	80.7	"
2113	2.6	8.17	1583	6.81	81.4	"
2116	sample					

~~4:40~~

Laboratory ~~SGS~~ Test Am

	Analysis	Sample Containers	Preservatives	Dup
☒	PFAS x18	2 250mL	None	☐
☐				☐
☐				☐
☐				☐
☐				☐
☐				☐

~~2010 10.3 DTW~~

~~4min / 150mL @ 2020~~

Well No. GP-TWP-01

MDN

MONITORING WELL SAMPLING LOG

Owner/Client: OME
Location: Temp well pt NE of AK Airlines bldg
Sampling Personnel: MDN
Weather Conditions: ~~105~~ clear/sunny Air Temp. (°F): 105

Project No.: 105745
Date: 10/31/20
Well: ~~AKA-TWP-01~~
Time started: 1350
Time completed: 15:20

Sample No.: AKA-TWP Time: 1504
Duplicate: — Time: —
Equipment Blank: — Time: —

Pump: Peristaltic (TTT)
Purging Method: (portable) / dedicated pump
Pumping Start: 1405
Purge Rate (gal./min.): @ 0.06 gal/min
Pumping End: 1503

Pump Set Depth Below MP (ft.): ~10.5ft
KuriTec Tubing (ft.): ~~10~~ 10ft
peri TruPoly Tubing (ft.): 18ft

Diameter and Type of Casing: 1" PVC TWP
Approximate Total Depth of Well Below MP (ft.): —
Measured Total Depth of Well Below MP (ft.): 14.47
Depth to Water Below MP (ft.): 10.10
Depth to Ice (if frozen) Below MP (ft.): —
Feet of Water in Well: 4.37
Gallons per foot: 0.08
Gallons in Well: 0.35
Purge Water Volume (gal.): ~3.7 gallons
Purge Water Disposal: GAC x3 5-gallon filtration

Monument Condition: N/A, TWP

Casing Condition: N/A

Wiring Condition (dedicated pumps): N/A

Measuring Point (MP): Top of Casing (TOC)
Monument type: Stickup / Flushmount
Measurement method: Rod & level / Tape measure

Top-of-casing to monument (ft.): —
Monument to ground surface (ft.): -0.12 (below ground)

Datalogger type: n/a
Datalogger serial #: n/a
Measured cable length (ft.): n/a

- ☐ Lock present and operational (N/A)
- ☐ Well name legible on outside of well
- ☐ Evidence of frost-jacking

Notes: Spoke w/ AK Airlines personello

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	2	3	4	6	8
Gallons per lineal foot	0.000253	0.08	0.17	0.38	0.66	1.5	2.6

230 mL/min

MDN

Well No.
AKA-TWP-01

MONITORING WELL SAMPLING LOG

Field Parameter Instrument YSI F Circle one: *Parameters stabilized or >3 well volumes purged*

Sample Observations —

Notes —

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C) [± 3%]	Dissolved Oxygen (mg/L) [±10%]	Conductivity (µS/cm) [± 3%]	pH [± 0.1]	ORP (mV) [± 10 mV]	Water Clarity (visual)
1405	Pump start					v. turbid
1410	pull up					sl. turbid, pull up
1415						" "
1419	pull up to sample interval					clear, pull up
1420	~~2.3~~					sl. turbid
1428	~~2.3~~					near clear, connect YSI
1433	2.3	4.16	1199	6.78	~~141.0~~ 141.0	clear
1436	2.3	3.72	1186	6.72	130.8	
1439	2.3	4.06	1178	6.72	123.4	
1441	2.3	6.41	1127	6.725	109.4	
1445	2.2	6.48	1120	6.75	106.9	bubbles in line, turn down
1448	2.1	4.62	1137	6.75	100.2	
1451	2.2	4.18	1146	6.74	96.8	
1454	2.3	3.75	1144	6.74	94.0	
1457	2.3	3.98	1165	6.74	93.6	
1500	2.3	3.90	1168	6.73	92.1	
1503	2.3	3.85	1165	6.73	90.5	

Laboratory ~~SGS~~ Test America/ Eurofins

	Analysis	Sample Containers	Preservatives	Dup
~~☐~~ ✓	PFAS x18	x2 250mL	None	☐
☐				☐
☐				☐
☐				☐
☐				☐
☐				☐

~~4ft from bottom~~

MDN

Well No.
AKA-TWP-01

MONITORING WELL SAMPLING LOG

Owner/Client: DOT & PF
Location: OME
Sampling Personnel: APW / VTY
Weather Conditions: Partly Cloudy Air Temp. (°F): 23

Project No.: 105745
Date: 10/31/20
Well: OME-MW01-15
Time started: 16:45
Time completed: 17:45

Sample No.: OME-MW01-15 Time: 17:35
Duplicate: — Time: —
Equipment Blank: EB-MW01-15 Time: 18:00

Pump: whale Pump F
Purging Method: *portable* / *dedicated pump*
Pumping Start: 16:57
Purge Rate (gal./min.): ~1
Pumping End: 17:35

Pump Set Depth Below MP (ft.): ~14
KuriTec Tubing (ft.): ~30
TruPoly Tubing (ft.): —

Diameter and Type of Casing: 2" PVC
Approximate Total Depth of Well Below MP (ft.): ~15
Measured Total Depth of Well Below MP (ft.): 14.56
Depth to Water Below MP (ft.): 7.05
Depth to Ice (if frozen) Below MP (ft.): —
Feet of Water in Well: 7.51
Gallons per foot: 0.17
Gallons in Well: 1.28
Purge Water Volume (gal.): 38
Purge Water Disposal: Onsite GAC Treatment

Monument Condition: Good
Casing Condition: Good
Wiring Condition (dedicated pumps): N/A

Measuring Point (MP): *Top of Casing (TOC)*
Monument type: *Stickup* / *Flushmount*
Measurement method: *Rod & level* / *Tape measure*

Top-of-casing to monument (ft.): -0.45
Monument to ground surface (ft.): N/A

Datalogger type: n/a
Datalogger serial #: n/a
Measured cable length (ft.): n/a

- ☐ Lock present and operational N/A
- ☑ Well name legible on outside of well
- ☐ Evidence of frost-jacking N/A, new

Notes: DTW 14.56 to 45 = ~~14~~ below ground: 7.05+0.45 = 7.50'

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	2	3	4	6	8
Gallons per lineal foot	0.000253	0.08	0.17	0.38	0.66	1.5	2.6

Well No.

MDW

OME-MW01-15

MONITORING WELL SAMPLING LOG

Field Parameter Instrument YSI Pro Plus Circle one: *Parameters stabilized or >3 well volumes purged*

Sample Observations —

Notes —

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C) [± 3%]	Dissolved Oxygen (mg/L) [±10%]	Conductivity (µS/cm) [± 3%]	pH [± 0.1]	ORP (mV) [± 10 mV]	Water Clarity (visual)
16:57	Purge	start				
17:00	1.9	10.96	1420	6.99	77.4	Turbid
17:03	2.1	0.15	1367	6.99	64.5	Turbid
17:06	2.1	0.06	1361	6.93	52.4	slightly turbid
17:09	2.1	0.08	1356	6.95	41.6	slightly turbid
17:12	2.1	0.09	1358	6.95	33.8	Clear
17:15	2.1	0.09	1357	6.96	25.6	↓
17:18	2.1	0.10	1359	6.97	18.6	
17:21	2.1	0.11	1359	6.97	12.7	
17:24	2.1	0.20	1353	6.97	7.8	
17:27	2.1	0.19	1354	6.97	3.5	
17:30	2.1	0.18	1357	6.97	-0.3	
17:33	2.1	0.19	1355	6.97	-4.0	V
17:35	sample	time				

Laboratory SGS + Eurofins TestAmerica

	Analysis	Sample Containers	Preservatives	Dup
☑	PFAS x18		—	☐
☑	GRO		HCl	☐
☑	BTEX		HCl	☐
☑	DRO/RRO		HCl	☐
☐	PAH (only for EB)		—	☐
☐				☐

MDW

Well No.

OME-MW01-15

MONITORING WELL SAMPLING LOG

Owner/Client: DOT & PF
Location: OME
Sampling Personnel: APW / VTY
Weather Conditions: Partly Cloudy Air Temp. (°F): 20

Project No.: 105745
Date: 10/31/20
Well: OME-MW01-30
Time started: 15:45
Time completed: 17:00

Sample No.: OME-MW01-30 Time: 16:40
Duplicate: — Time: —
Equipment Blank: — Time: —

Pump: Whale Pump F
Purging Method: portable / dedicated pump
Pumping Start: 16:02
Purge Rate (gal./min.): ~1
Pumping End: 16:40

Pump Set Depth Below MP (ft.): ~28
KuriTec Tubing (ft.): ~35
TruPoly Tubing (ft.): —

Diameter and Type of Casing: 2" PVC
Approximate Total Depth of Well Below MP (ft.): ~30
Measured Total Depth of Well Below MP (ft.): 28.79
Depth to Water Below MP (ft.): 6.35
Depth to Ice (if frozen) Below MP (ft.): —
Feet of Water in Well: 22.44
Gallons per foot: 0.17
Gallons in Well: 3.82
Purge Water Volume (gal.): 38
Purge Water Disposal: Onsite GAC Treatment

Monument Condition: Good

Casing Condition: Good

Wiring Condition (dedicated pumps): N/A

Measuring Point (MP): Top of Casing (TOC)

Monument type: Stickup / Flushmount
Measurement method: Rod & level / Tape measure

Top-of-casing to monument (ft.): -0.52
Monument to ground surface (ft.): Flush

Datalogger type: n/a
Datalogger serial #: n/a
Measured cable length (ft.): n/a

- ☐ Lock present and operational N/A
- ☑ Well name legible on outside of well
- ☐ Evidence of frost-jacking N/A, new

Notes: DTW 6.35 + 0.52 = 6.87' bgs

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	2	3	4	6	8
Gallons per lineal foot	0.000253	0.08	0.17	0.38	0.66	1.5	2.6

Well No.

MDW

OME-MW01-30

MONITORING WELL SAMPLING LOG

Field Parameter Instrument YSI Pro Plus Circle one: *Parameters stabilized or >3 well volumes purged*

Sample Observations —

Notes —

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C) [± 3%]	Dissolved Oxygen (mg/L) [±10%]	Conductivity (µS/cm) [± 3%]	pH [± 0.1]	ORP (mV) [± 10 mV]	Water Clarity (visual)
16:02	Purge Start					
16:05	1.0	0.28	1347	6.82	77.1	Turbid
16:08	1.0	0.20	1343	6.85	65.3	Slightly turbid
16:11	1.0	0.46	1344	6.92	45.0	Clear
16:14	1.0	0.48	1346	6.95	23.0	↓
16:17	1.0	0.50	1346	6.95	20.2	
16:20	1.0	0.48	1351	6.96	8.7	
16:23	1.0	0.48	1347	6.97	1.3	
16:26	1.0	0.49	1347	6.96	-4.6	
16:29	1.0	0.50	1347	6.97	-9.2	
16:32	1.0	0.50	1347	6.97	-15.5	
16:35	1.0	0.50	1347	6.97	-21.6	
16:38	1.0	0.50	1347	6.97	-25.2	
16:40	Sample Time					

Laboratory SGS + Eurofins TestAm

	Analysis	Sample Containers	Preservatives	Dup
☑	PFAS x 18		—	☐
☑	GRO		HCl	☐
☑	BTEX		HCl	☐
☑	DRO, RRO		HCl	☐
☐				☐
☐				☐

MDN

Well No.
OME-MW01-30

MONITORING WELL SAMPLING LOG

Owner/Client: OME
Location: Northwest of ARFF Bldg near Taxiway Hotel
Sampling Personnel: MDN
Weather Conditions: clear/cold Air Temp. (°F): 10s

Project No.: 105745
Date: 10/31/20
Well: OME-MW02-15
Time started: 11:05
Time completed: 13:15

Sample No.: OME-MW02-15 Time: 12:30
Duplicate: OME-MW03-15 Time: 12:40
Equipment Blank: — Time: —
Field Blank: FB-MW02-15 Time: 12:45

Pump: Whale pump
Purging Method: portable / dedicated pump
Pumping Start: 11:40
Purge Rate (gal./min.): variable ~1/2 gpm
Pumping End: 12:52

Pump Set Depth Below MP (ft.): 10.5ft
KuriTec Tubing (ft.): 40ft
TruPoly Tubing (ft.): —

Diameter and Type of Casing: 2" PVC
Approximate Total Depth of Well Below MP (ft.): —
Measured Total Depth of Well Below MP (ft.): 14.00
Depth to Water Below MP (ft.): 8.43
Depth to Ice (if frozen) Below MP (ft.): —
Feet of Water in Well: ~~0.17~~ 5.57
Gallons per foot: ~~5.57~~ 0.17
Gallons in Well: 0.95
Purge Water Volume (gal.): ~30 gallons + water purged during depth on 10/30
Purge Water Disposal: GAC filtration

Monument Condition: ~~N/A, TWP~~ Good, brand new
Casing Condition: ~~N/A~~ Good
Wiring Condition (dedicated pumps): N/A

Measuring Point (MP): Top of Casing (TOC)
Monument type: Stickup / Flushmount
Measurement method: Rod & level / Tape measure

Top-of-casing to monument (ft.): — (quarter)
Monument to ground surface (ft.): -0.42 (monument is flush with surface)

Datalogger type: n/a
Datalogger serial #: n/a
Measured cable length (ft.): n/a

- ☐ N/A Lock present and operational
- ☐ Well name legible on outside of well
- ☐ Evidence of frost-jacking

Notes: tubing froze
DTW 8.43 + 0.42 = 8.85 ft bgs

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	2	3	4	6	8
Gallons per lineal foot	0.000253	0.08	0.17	0.38	0.66	1.5	2.6

MDN

Well No.
OME-MW02-15

MONITORING WELL SAMPLING LOG

Field Parameter Instrument YSI F Circle one: *Parameters stabilized* or *>3 well volumes purged*

Sample Observations (MW) Sample the day after well development

Notes (MW) >> 3 well vol's

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C) [± 3%]	Dissolved Oxygen (mg/L) [±10%]	Conductivity (µS/cm) [± 3%]	pH [± 0.1]	ORP (mV) [± 10 mV]	Water Clarity (visual)
11:40	start pump					v. turbid
11:46						turbid
11:56	connect YSI					clear
11:58	-0.2	0.55	688	7.03	205.2	"
12:00	change flow rate, froze					turbid
12:01	0.2	0.56	671	7.03	193.2	sl. turbid
12:04	-0.1	0.57	636	6.99	175.0	"
12:07	-0.1	0.57	608	7.02	157.2	"
12:10	-0.1	0.59	611	7.02	151.4	"
12:15	change rate again, froze		(MW) YSI connector froze			turbid
12:21						sl. turbid
12:23						clear
12:26	reconnect YSI					
12:27	-0.2	0.55	610	7.16	133.6	clear
12:30	sample					

Laboratory SGS / Test Am Eurofins

	Analysis	Sample Containers	Preservatives	Dup
☒	PFAS	x2 250mL	None	☒
☒	GRO	x3 VOA	HCl	☒
☒	BTEX	x3 VOA	HCl	☒
☒	DRO/RRO	x2 amber	HCl	☒
☒	PAHs	x2 amber	None	☒
☐				☐

MDN

Well No.

OME-MW02-15

MONITORING WELL SAMPLING LOG

Owner/Client: DOT - OME
Location: North end of 3-21
Sampling Personnel: VTY, MDN
Weather Conditions: clear, Air Temp. (°F): low 30s

Project No.: 105745-002
Date: 10/26/20
Well: 3-21-TWP-01
Time started: 1800
Time completed: 1915

Sample No.: 3-21-TWP-01 Time: 1904
Duplicate: / Time:
Equipment Blank: / Time: /

Pump: peri
Purging Method: *portable* / *dedicated pump*
Pumping Start: 1815
Purge Rate (gal./min.): 0.13
Pumping End: 1910

Pump Set Depth Below MP (ft.): 13.6 ft
KuriTec Tubing (ft.): /
TruPoly Tubing (ft.): 40

Diameter and Type of Casing: 1" PVC TWP
Approximate Total Depth of Well Below MP (ft.): —
Measured Total Depth of Well Below MP (ft.): 17.52
Depth to Water Below MP (ft.): 8.5
Depth to Ice (if frozen) Below MP (ft.): —
Feet of Water in Well: ~9
Gallons per foot: 0.08
Gallons in Well: 0.72
Purge Water Volume (gal.): 7.15
Purge Water Disposal: onsite GAC treatment

Monument Condition: n/a; TWP Initially installed as steel SP w/ PVC screen, replaced due to low recharge w/ PVC casing + screen.
Casing Condition: n/a

Wiring Condition (dedicated pumps): n/a

Measuring Point (MP): *Top of Casing (TOC)*
Monument type: *Stickup* / *Flushmount*
Measurement method: *Rod & level* / *Tape measure*

Top-of-casing to monument (ft.): N/A
Monument to ground surface (ft.): 0.10

Datalogger type: n/a
Datalogger serial #: n/a
Measured cable length (ft.): n/a

- ☐ Lock present and operational
- ☐ Well name legible on outside of well
- ☐ Evidence of frost-jacking: n/a

Notes: water sampler inoperable 10/26, re-measure DTW when removed TWP on 10/30, was after casing was cut down. DTW 4.54 ft

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	2	3	4	6	8
Gallons per lineal foot	0.000253	0.08	0.17	0.38	0.66	1.5	2.6

MDN

MONITORING WELL SAMPLING LOG

Field Parameter Instrument: YSI F Circle one: *Parameters stabilized or >3 well volumes purged*

Sample Observations: none

Notes:

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C) [± 3%]	Dissolved Oxygen (mg/L) [±10%]	Conductivity (µS/cm) [± 3%]	pH [± 0.1]	ORP (mV) [± 10 mV]	Water Clarity (visual)
1815,	after clear	clearing casing v. slow change				v. turbid to turbid
turn down progressively, bubbles						
1837	turn down to speed 2, steady					
1838 connect to YSI						clear
~~1839~~	~~0.5~~	~~13.83~~	~~14.7~~	~~7.81~~	~~167.3~~	~~clear~~
1841	1.2	~~9.95~~ 3.17	998	7.21	91.3	clear
1846	1.2	0.75	964	7.18	53.0	clear
1849	1.2	0.64	961	7.11	46.0	clear
1852	1.2	0.51	957	7.07	39.2	clear
1855	1.2	0.50	959	7.05	32.7	clear
1858	1.2	0.49	959	7.01	28.2	clear
1901	1.2	0.46	959	7.01	24.8	clear
1904	sample					

Laboratory: ~~SGS~~ Test Am

	Analysis	Sample Containers	Preservatives	Dup
☑	PFAS ~~X-RAY~~	2 250mL	none	☐
☐				☐
☐				☐
☐				☐
☐				☐
☐				☐

10.85
~~13.16~~

MDN

3-21-TWP-01
Well No.

MONITORING WELL SAMPLING LOG

Owner/Client: DOT & PF
Location: ~~Alaska Airlines terminal~~ East of old hanger (Mark Air) on former Flight Services Sta Lot
Sampling Personnel: APW, VTY
Weather Conditions: Clear Air Temp. (°F): 34

Project No.: 105745
Date: 10/28/20
Well: MW-5
Time started: 13:30
Time completed: 15:30

Sample No.: MW-5 Time: 15:15
Duplicate: MW-6 Time: 15:05
Equipment Blank: - Time: -

Pump: Whale Pump F
Purging Method: (portable) / dedicated pump
Pumping Start: 14:30
Purge Rate (gal./min.): ~0.4
Pumping End: 1515

Pump Set Depth Below MP (ft.): ~17'
KuriTec Tubing (ft.): ~30'
TruPoly Tubing (ft.): N/A

Diameter and Type of Casing: 2" PVC
Approximate Total Depth of Well Below MP (ft.): 18
Measured Total Depth of Well Below MP (ft.): 17.94
Depth to Water Below MP (ft.): 11.43
Depth to Ice (if frozen) Below MP (ft.): -
Feet of Water in Well: 6.51
Gallons per foot: 0.17
Gallons in Well: 1.17 (3)
Purge Water Volume (gal.): 16.8 + 5 = ~22 gal

Purge Water Disposal: Onsite GAC treatment

Monument Condition: Good

Casing Condition: Good

Wiring Condition (dedicated pumps): N/A

Measuring Point (MP): Top of Casing (TOC)

Monument type: Stickup / (Flushmount)
Measurement method: Rod & level / (Tape measure)

Top-of-casing to monument (ft.): -0.18
Monument to ground surface (ft.): 0.0

Datalogger type: n/a
Datalogger serial #: n/a
Measured cable length (ft.): n/a

- ☑ Lock present and operational
- ☐ Well name legible on outside of well N/A
- ☐ Evidence of frost-jacking None

Notes: Petroleum odor in purge water.

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	(2)	3	4	6	8
Gallons per lineal foot	0.000253	0.08	0.17	0.38	0.66	1.5	2.6

MDN

Well No. MW-5

MONITORING WELL SAMPLING LOG

Field Parameter Instrument YSI Pro Plus Circle one: *Parameters stabilized or >3 well volumes purged*

Sample Observations —

Notes Purged ~5-gal during initial re-developement before connecting YSI

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C) [± 3%]	Dissolved Oxygen (mg/L) [±10%]	Conductivity (µS/cm) [± 3%]	pH [± 0.1]	ORP (mV) [± 10 mV]	Water Clarity (visual)
14:30	Purge	start				
14:33	3.9	3.76	1117	6.48	189.3	slightly turbid
14:36	3.9	2.51	1095	6.50	174.5	" "
14:39	3.9	1.65	1075	6.50	159.6	" "
14:42	3.8	1.33	1063	6.52	149.9	Clear
14:45	3.8	1.09	1050	6.51	140.0	Clear
14:48	3.8	0.94	1042	6.54	132.4	Clear
14:51	3.8	0.83	1031	6.55	125.5	Clear
14:54	3.8	0.73	1022	6.56	119.2	Clear
14:57	3.8	0.80	1021	6.57	115.6	Clear
15:00	3.8	0.70	1013	6.58	109.8	Clear
15:03	3.8	0.73	1009	6.59	104.9	Clear
15:06	3.8	0.63	1007	6.60	101.2	Clear
15:09	3.8	0.65	1009	6.60	97.9	Clear
15:12	3.8	0.68	1003	6.60	94.2	Clear
15:15	Sample	time				

Laboratory ~~SGS~~ Test Am Eurofins

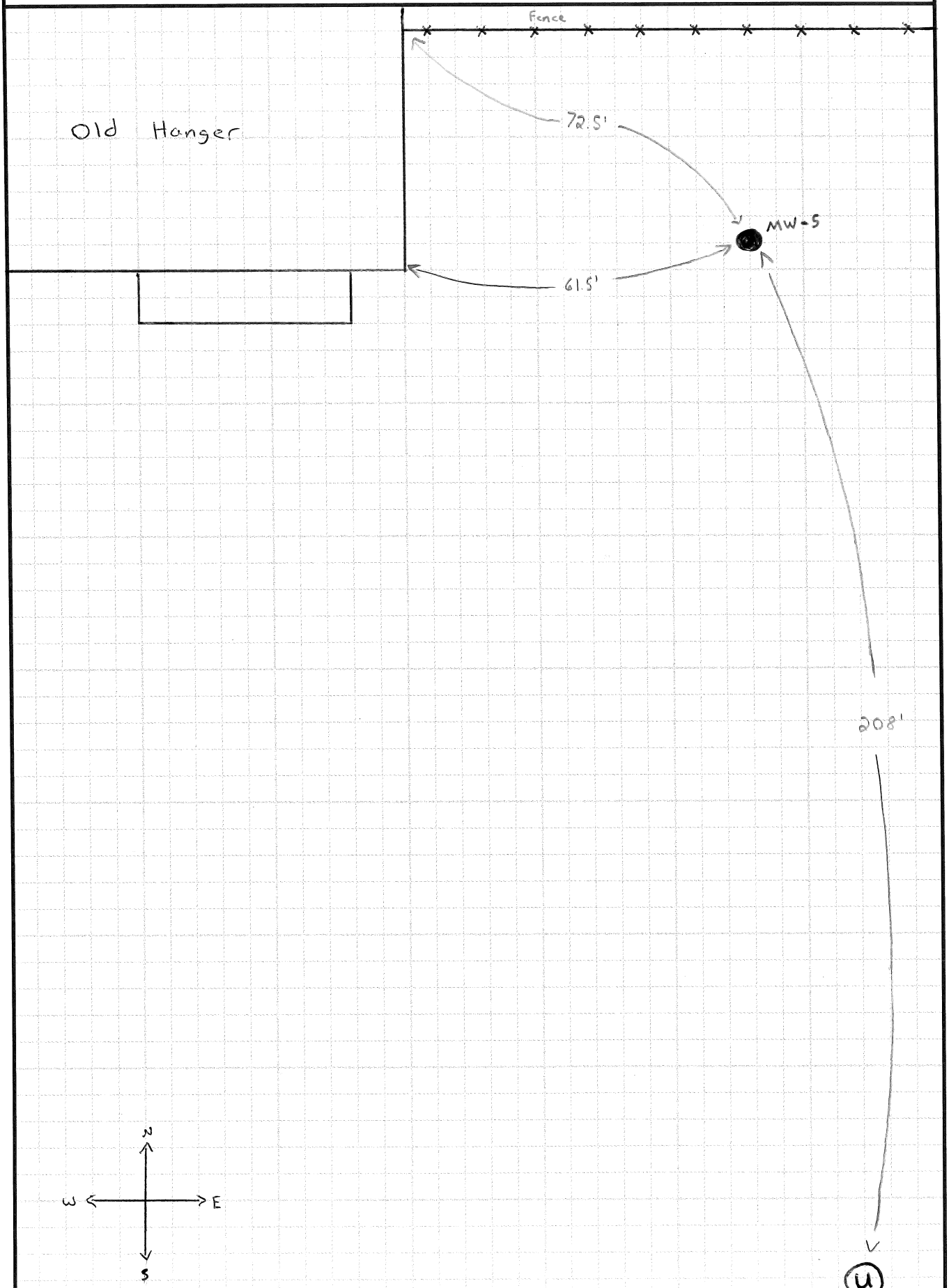
	Analysis	Sample Containers	Preservatives	Dup
☑	PFAS x 18	x2 250mL HDPE	N/A	☑
☐				☐
☐				☐
☐				☐
☐				☐
☐				☐

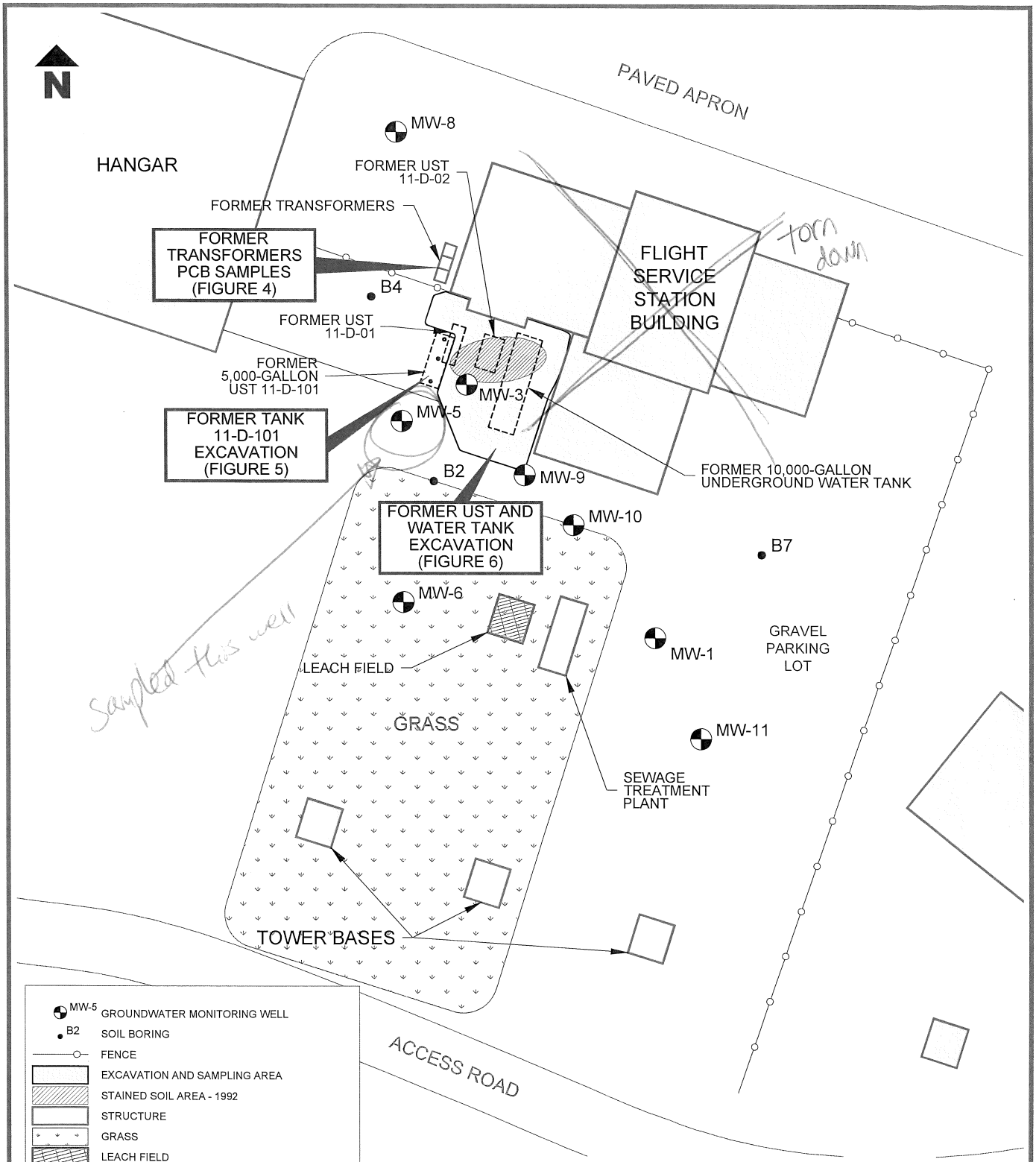
MDN

Well No. MW-5

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

JOB NAME DOT & PF Statewide PFAS JOB NO. 105745
SUBJECT Swing Ties DATE 10/29/30
BY APW CHK'D SHEET 1 of 1





THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

SLR

MARSH CREEK, LLC

Report: 2014 FLIGHT SERVICE STATION (FSS) ENVIRONMENTAL REMEDIATION REPORT

Drawing: AREA OF CONCERN: FLIGHT SERVICE STATION BUILDING 400

Date: October 2014	Scale: 1"= 40 Feet	Fig. No. 2
File Name: F1-6 Nome Remed RPT_14	Project No.: 105.00711.14001	

MONITORING WELL SAMPLING LOG

Owner/Client DOT & PF
Location Offsite; south of 10-28 near Dredge 5 (west end of RW)
Sampling Personnel VTY, APW
Weather Conditions clear Air Temp. (°F) ~20

Project No. 105745
Date 10/28/2020
Well MW-D5-01
Time started 16:30
Time completed 21:01

Sample No. MW-D5-01 Time 20:48
Duplicate / Time /
Equipment Blank / Time /

Pump peri
Purging Method portable / dedicated pump
Pumping Start 1950
Purge Rate (gal./min.) 0.06
Pumping End 2050

Pump Set Depth Below MP (ft.) ~~25~~ 24.5
KuriTec Tubing (ft.) 40
TruPoly Tubing (ft.) 40

Diameter and Type of Casing 2" PVC
Approximate Total Depth of Well Below MP (ft.) ~~25.02~~
Measured Total Depth of Well Below MP (ft.) 25.02
Depth to Water Below MP (ft.) 21.95
Depth to Ice (if frozen) Below MP (ft.) —
Feet of Water in Well 3.07
Gallons per foot 0.17
Gallons in Well 0.52
Purge Water Volume (gal.) ~4
Purge Water Disposal onsite GAC treatment

Monument Condition good; cut lock and replaced
Casing Condition good
Wiring Condition (dedicated pumps) /

Measuring Point (MP) Top of Casing (TOC)
Monument type: Stickup / Flushmount
Measurement method: Rod & level / Tape measure

Top-of-casing to monument (ft.) 1.5
Monument to ground surface (ft.) 2.62

Datalogger type n/a
Datalogger serial # n/a
Measured cable length (ft.) n/a

- [x] Lock present and operational (rusted, cut and replaced w/ new one)
- [ ] Well name legible on outside of well
- [ ] Evidence of frost-jacking n/a

Notes —

WELL CASING VOLUMES

Diameter of Well [ID-inches]	CMT	1¼	2	3	4	6	8
Gallons per lineal foot	0.000253	0.08	0.17	0.38	0.66	1.5	2.6

MDN

Well No.
MW-D5-01

MONITORING WELL SAMPLING LOG

Field Parameter Instrument YSI Pro+ F   Circle one: *Parameters stabilized* or *>3 well volumes purged*

Sample Observations —

Notes sampled close to bottom of well ~~[illegible]~~

FIELD PARAMETERS [stabilization criteria]

Time	Temp. (°C) [± 3%]	Dissolved Oxygen (mg/L) [±10%]	Conductivity (µS/cm) [± 3%]	pH [± 0.1]	ORP (mV) [± 10 mV]	Water Clarity (visual)
20:00	2.0	5.31	1863	6.77	143.3	sl. turbid
20:03	2.1	3.98	1868	6.77	139.1	↓
20:06	2.0	3.42	1857	6.79	135.7	
20:09	2.0	2.70	1837	6.77	130.6	
20:12	1.9	2.13	1809	6.78	125.7	
20:15	1.7	2.40	1763	6.78	120.2	
20:18	1.8	2.41	1747	6.79	116.8	
20:21	1.8	0.41	1713	6.78	112.6	
20:24	1.9	0.43	1670	6.77	107.2	
20:27	1.8	0.60	1621	6.77	100.0	
20:30	1.7	0.26	1597	6.79	98.8	
20:33	1.8	0.19	1577	6.79	95.2	
20:36	1.8	0.19	1533	6.80	90.0	
20:39	1.5	0.16	1522	6.80	87.5	
20:42	1.5	0.16	1510	6.81	85.2	
20:45	1.5	0.16	1483	6.81	81.0	
20:48	sample					

Laboratory ~~SGS~~ ~~TestAmerica~~ Eurofins

	Analysis	Sample Containers	Preservatives	Dup
☑	PFAS x 18	2x 250 ml	—	☐
☐				☐
☐				☐
☐				☐
☐				☐
☐				☐

MDN

Well No. MW-D5-01

APPENDIX C: PUBLIC INFORMATION

Appendix C

Public Information

CONTENTS

THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

Department of Transportation and Public Facilities

DIVISION OF STATEWIDE AVIATION

P.O. Box 196900, 99519-6900
4111 Aviation Avenue, 99502
Anchorage, AK
Main: 907.269.0730
Fax: 907.269.0489
dot.state.ak.us

October 16, 2020

Dear Property Owner or Occupant:

The Department of Transportation and Public Facilities (DOT&PF) is conducting a comprehensive evaluation of for per- and polyfluoroalkyl substances (PFAS) contamination at state owned airports. Firefighters at the Nome Airport have used aqueous film forming foam (AFFF), a standard firefighting agent that contains PFAS, to extinguish hydrocarbon fires during training exercises and emergency events.

The DOT&PF has contracted with environmental consulting firm, Shannon & Wilson, Inc., to sample water supply wells, groundwater, soil, and surface water primarily on Nome Airport property. We understand much of the well search area is served by the Nome Joint Utility System. However, Shannon & Wilson, Inc. is checking to verify connection to utility water or if your property has a water supply well as a secondary water source.

Shannon & Wilson, Inc. will be in Nome **Oct. 20 through Oct. 28, 2020**. If you have an active well please call (907) 434-2464 to schedule a sampling appointment. Water supply well sample results will be compared to the U.S. Environmental Protection Agency health advisory level of 70 parts per trillion for the sum of perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA), two compounds within the PFAS family. PFAS are emerging contaminants, research into the health effects of exposure to PFAS is ongoing. Results of the water samples will be shared with property owners and residents. If your drinking-water well is found to have PFAS above the advisory level, DOT&PF will assist with access to clean drinking water.

In response to the global coronavirus (COVID-19) pandemic it has been requested of countries, communities, companies and individuals to do their part to make every effort to slow and prevent the spread of COVID-19. DOT&PF and Shannon & Wilson, Inc. have submitted protective plans to the state of Alaska in accordance with Health Mandate 10, and are committed to ensuring the health, safety and protection of personnel, their families and the communities in which they serve.

The project team has been in contact with your local government to obtain permission and ensure compliance with travel, testing, and quarantine requirements for essential workers. Water supply well sampling requires special consideration due to the nature of the work.

Shannon & Wilson, Inc. field personnel shall adhere to the following guidelines:

- COVID-19 guidelines provided by the Center for Disease Control;
- Field staff will ask residents a series of questions to determine if the environment is safe to enter for all parties involved;
- Field staff will not collect samples where either the owner or occupant refuses access; and
- When possible, field staff will purge wells and obtain a sample from an outside spigot.

If you have any questions, please contact me, or see the enclosed contact list to identify the most appropriate person or agency for your inquiry. To view the DOT&PF COVID-19 protective plan visit: https://bit.ly/2Y1oTPV. We appreciate your patience as we work through this process.

Sincerely,

Sammy Cummings
PFAS Program Manager, DOT&PF Statewide Aviation

THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

Department of Transportation and Public Facilities

DIVISION OF STATEWIDE AVIATION

P.O. Box 196900, 99519-6900
4111 Aviation Avenue, 99502
Anchorage, AK
Main: 907.269.0730
Fax: 907.269.0489
dot.state.ak.us

PFAS Fact Sheet – Nome Airport

October 2020

Per- and polyfluoroalkyl substances (PFAS) are a group of manmade chemicals used for a wide variety of residential, commercial, and industrial uses. PFAS are considered emerging environmental contaminants and the health effects are not well known. PFAS are used in a large number of consumer products ranging from fabric waterproofing compounds, non-stick cookware, stain resistant carpeting, some food packaging and firefighting foams.

The presumed source of PFAS in groundwater in your community is the use of a fire-fighting foam called aqueous film forming foam (AFFF). Airport firefighters used the foam to extinguish petroleum fires during training exercises and emergency events.

The Alaska Department of Transportation & Public Facilities (DOT&PF) has hired Shannon & Wilson to test water supply wells near the airport for perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and other PFAS compounds. Much of the well search area is served by the Nome Joint Utility System and may not have wells.

The U.S. Environmental Protection Agency (EPA) lifetime health advisory (LHA) level for drinking water is **70 parts per trillion** for the sum of PFOS and PFOA, two compounds within the PFAS family.

We advise residents with test results above this level not to use their water for drinking or cooking. If your well is considered affected, you can continue to shower, clean, and do laundry.

Test results are typically available within three to four weeks of sample collection. If your well is found to have PFAS above the EPA LHA, DOT&PF will assist with access to an alternate source of drinking water.

Website: www.dot.alaska.gov/airportwater/

For questions about well testing:
Shannon & Wilson, Inc.
Marcy Nadel, Project Manager
Phone in Nome: 907-434-2464
Office Phone: 907-458-3150
Email: mdn@shanwil.com

For regulatory questions:
Alaska Dept. of Environmental Conservation
Kara Kusche, Contaminated Sites Program
Phone: 907-269-7530
Email: kara.kusche@alaska.gov

For questions about PFAS and health effects:
Alaska Dept. of Health & Social Services
Sarah Yoder, Public Health Specialist
Phone: 907-269-8054
Email: sarah.yoder@alaska.gov

To file an insurance claim:
Division of Risk Management
Ken Simpson, Claims Administrator
Phone: 907-465-2183
Email: ken.simpson@alaska.gov

For questions about fire training & other inquiries:
DOT&PF – Statewide Aviation
Sammy Cummings, PFAS Program Manager
Phone: 907-888-5671
Email: airportwater@alaska.gov

LEGEND

- Well Search Areas
- Area 1
- Area 2
- Historic aqueous film forming foam (AFFF) release site

N

0 0.25 0.5

Miles

Nome Airport
Nome, Alaska

PFAS WELL SEARCH AREA

October 2020 105745-002

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 1

Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)
Frequently Asked Questions

What are PFAS?

Perfluoroalkyl and polyfluoroalkyl substances (PFAS) are a large group of man-made chemicals that have been used in industry and consumer products worldwide since the 1950s.

- PFAS do not occur naturally, but are widespread in the environment.
- PFAS are found in people, wildlife and fish all over the world.
- Some PFAS can stay in people's bodies a long time.
- Some PFAS do not break down easily in the environment.

How can I be exposed to PFAS?

PFAS contamination may be in drinking water, food, indoor dust, some consumer products, and workplaces. Most non worker exposures occur through drinking contaminated water or eating food that contains PFAS.

Although some types of PFAS are no longer used, some products may still contain PFAS:

- Food packaging materials
- Nonstick cookware
- Stain resistant carpet treatments
- Water resistant clothing
- Cleaning products
- Paints, varnishes and sealants
- Firefighting foam
- Some cosmetics

How can I reduce my exposure to PFAS?

PFAS are present at low levels in some food products and in the environment (air, water, soil etc.), so you probably cannot prevent PFAS exposure altogether. However, if you live near known sources of PFAS contamination, you can take steps to reduce your risk of exposure.

- If your drinking water contains PFAS above the EPA Lifetime Health Advisory, consider using an alternative or treated water source for any activity in which you might swallow water:
  - » drinking
  - » food preparation
  - » cooking
  - » brushing teeth, and
  - » preparing infant formula
- Check for fish advisories for water bodies where you fish.
  - » Follow fish advisories that tell people to stop or limit eating fish from waters contaminated with PFAS or other compounds.
  - » Research has shown the benefits of eating fish, so continue to eat fish from safe sources as part of your healthy diet.
- Read consumer product labels and avoid using those with PFAS.

Agency for Toxic Substances and Disease Registry
Division of Community Health Investigations
ATSDR

How can PFAS affect people's health?

Some scientific studies suggest that certain PFAS may affect different systems in the body. NCEH/ATSDR is working with various partners to better understand how exposure to PFAS might affect people's health—especially how exposure to PFAS in water and food may be harmful. Although more research is needed, some studies in people have shown that certain PFAS may:

- affect growth, learning, and behavior of infants and older children
- lower a woman's chance of getting pregnant
- interfere with the body's natural hormones
- increase cholesterol levels
- affect the immune system and
- increase the risk of cancer

At this time, scientists are still learning about the health effects of exposures to mixtures of PFAS.

How can I learn more?

You can visit the following websites for more information:

- **CDC/ATSDR:**
  - CDC Info: https://www.cdc.gov/cdc-info/, or **(800) 232-4636**.
  - www.atsdr.cdc.gov/pfc/index.html
  - https://www.cdc.gov/exposurereport/index.html
- **Environmental Protection Agency (EPA):** https://www.epa.gov/chemical-research/research-and-polyfluoroalkyl-substances-pfas
- **Food and Drug Administration:** https://www.fda.gov/food/newsevents/constituentupdates/ucm479465.htm
- **National Toxicology Program:** https://ntp.niehs.nih.gov/pubhealth/hat/noms/pfoa/index.html

If you have questions about the products you use in your home, please contact the **Consumer Product Safety Commission (CPSC)** at **(800) 638-2772**.

List of Common PFAS and Their Abbreviations:

Abbreviation	Chemical name
PFOS	Perfluorooctane sulfonic acid
PFOA (or C8)	Perfluorooctanoic acid
PFNA	Perfluorononanoic acid
PFDA	Perfluorodecanoic acid
PFOSA (or FOSA)	Perfluorooctane sulfonaminde
MeFOSAA (aka Me-PFOSA-AcOH)	2-(N-Methyl-perfluorooctane sulfonamido) acetic acid
Et-FOSAA (aka Et-PFOSA-AcOH)	2-(N-Ethyl-perfluorooctane sulfonamido) acetic acid
PFHxS	Perfluorohexane sulfonic acid

THE STATE of ALASKA
GOVERNOR MICHAEL J. DUNLEAVY

Department of Health and Social Services

DIVISION OF PUBLIC HEALTH
Section of Epidemiology

3601 C Street, Suite 540
Anchorage, Alaska 99503-5932
Main: 907.269.8000
Fax: 907.562.7802

Fact Sheet on Perfluoroalkyl Substances (PFAS) in Drinking Water

What are PFAS and how can I be exposed?

- PFAS are human-made chemicals that are manufactured for their heat, water, and stain-resistant properties. They are used in a wide variety of common products, like rain gear, non-stick cookware, stain-resistant fabrics, and certain types of firefighting foams called aqueous film forming foams (AFFF), which are used to extinguish fuel and chemical fires.
- The use of AFFF is a common source of environmental PFAS contamination, particularly near airports, military bases, industrial sites, and fire training centers. AFFF discharged during firefighting activities can eventually migrate into the groundwater, contaminating nearby drinking water supplies.

How do I know if I have been previously exposed to PFAS and how can I remove it from my body?

- Because PFAS are used in so many different types of products, almost all people and animals have been exposed to more than one type of PFAS. There is no medical technique that can remove PFAS from the body, so the best approach is to stop the source of exposure and let the body's natural elimination processes slowly remove it.

How can PFAS affect my health?

- The likelihood of experiencing health effects from PFAS depends on many different factors, like how much, how often, and how long someone is exposed. Things like age, lifestyle, and underlying health status also play a role.
- Our current knowledge about the health effects of PFAS comes mostly from animal toxicology studies and a smaller number of human epidemiology studies; however, the number of human health studies showing effects are growing rapidly.
- Studies using human stem cells and animals show that certain types of PFAS can lead to negative effects on several different body systems. However, animals and humans have important differences in physiology that can cause them to respond to chemicals differently. Also, laboratory experiments usually use doses of PFAS that are much higher than the average person is likely to experience, so scientists are still learning about the potential health effects of low-dose exposure to PFAS.
- The Agency for Toxic Substances and Disease Registry (ATSDR) and the US Environmental Protection Agency (EPA) state that long-term exposure to high levels of PFAS can have the following effects on human health:
    - Gastrointestinal System- Ulcerative colitis
    - Liver- liver damage, abnormal fat metabolism, high cholesterol
    - Kidney- kidney cancer and chronic kidney disease
    - Cardiovascular system- pregnancy-induced hypertension
    - Immune system- decreased response to vaccines
    - Reproductive system- testicular cancer and decreased fertility
    - Endocrine system- thyroid disease
    - Development- reduced birth weight, skeletal abnormalities, altered puberty

What levels of PFAS are considered unsafe in drinking water?

- EPA issued the following lifetime health advisory (LHA) for two types of PFAS, called PFOS and PFOA: *"To provide Americans, including the most sensitive populations, with a margin of protection from a life- time of exposure to PFOA and PFOS from drinking water, EPA established the health advisory levels at 70 parts per trillion."* The LHA value of 70 ppt applies to PFOS and PFOA separately, and in combination with one another.
- The EPA has not yet developed guidance for additional types of PFAS compounds, some of which are thought to have human health effects similar to those of PFOS and PFOA. However, ATSDR issued the following draft guidance for four types of PFAS compounds in 2018:

ATSDR Drinking Water Screening Values		
COMPOUND	ADULT (ppt)	CHILD (ppt)
PFOA	78	21
PFOS	52	14
PFHxS	517	140
PFNA	78	21

** These values do not account for exposure from other sources, like dietary PFAS exposure and exposure from consumer products. They will also vary according to individual differences in body weight and water intake rates.*

- DEC previously required the provision of alternative drinking water when the sum concentration of PFOS + PFOA+ PFNA + PFHxS + PFHpA exceeded 70 ppt. However, a policy update that supersedes their previous guidelines was released on 4/10/19. DEC's new policy states that *"DEC will use the EPA LHA (PFOS+PFOA above 0.07 µg/L) as the Action Level. Any new testing for PFAS will be for PFOS and PFOA only."* More information on DEC's current and former PFAS policy can be found in their Technical Memorandum, dated 4/10/2019. Visit EPHP's FAQ's for a summary of the policies of other regulatory agencies.

What do I do if my drinking water is contaminated with PFAS above the DEC action level?

- If the concentration of PFAS in your drinking water exceeds the DEC action level, stop drinking the water and stop using it to prepare baby formula. Do not use contaminated water to wash or cook food (boiling contaminated water does not remove PFAS). Consider finding a clean water source for pets and other animals.

What if my water contains PFAS at concentrations that don't exceed DEC's current action level, but I still have concerns?

- People with concerns about these chemicals in their drinking water may want to consider taking measures to reduce their exposure from drinking water.

How can I reduce my exposure to PFAS?

- EPA provides information on filtration options that are effective at removing PFAS from drinking water on their website, and DEC provides information on water testing here.

Where can I get more information about PFAS?

- Visit the EPHP PFAS webpage for a list of answers to Frequently Asked Questions, or call 907-269-8000
- Visit the Alaska DEC Contaminated Sites webpage to learn more about PFAS sites in Alaska, or call 907-269-7545
- ATSDR also has a list of FAQs and information on talking to your doctor about PFAS exposure on their webpage.
- The Northwest Pediatric Environmental Health Specialty Unit (PEHSU) is also available for clinician consultation by phone (1-877-543-2436) or email (pehsu@u.washington.edu).

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Month X, 2020

Full Name/s
Mailing Address
City, Alaska xxxxx

RE: RESULTS OF OCTOBER 2020 PFAS WATER-SUPPLY WELL SAMPLING, NOME AIRPORT

Dear Mr. and Ms. Name,

Thank you for participating in our water-supply well sampling program to evaluate the potential presence of per- and polyfluoroalkyl substances (PFAS) in groundwater near the Nome Airport. Shannon & Wilson, Inc. collected a water sample on Month X, 2020, from the well at your residence/business. Enclosed are the analytical results for the sample from your residential/commercial water-supply well at PHYSICAL ADDRESS. We have prepared an identical letter for your tenant/s NAME.

The well-water sample was analyzed for perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and other PFAS compounds. We compare these concentrations to the U.S. Environmental Protection Agency's (EPA) health advisory level for drinking water. The lifetime health advisory level is 70 parts per trillion (ppt) for the sum of PFOS and PFOA. Please note that these units are equivalent to nanograms per liter (ng/L).

Results of the analysis conducted by TestAmerica Laboratories, Inc. indicate that PFOS was not/was detected at X ppt, and PFOA was not/was detected at X ppt in the water sample from your well. The sum of these PFOS and PFOA concentrations is less than/greater than the lifetime health advisory level. The portions of the original laboratory report that apply to your well (sample number *XXXXXX* and field-duplicate sample *XXXXXX*) are enclosed for your records.

2355 HILL ROAD
FAIRBANKS, ALASKA 99709-5326
907-479-0600 • FAX 907-479-5691

The Alaska Department of Transportation and Public Facilities (DOT&PF) plans to provide an alternate source of drinking water to the occupants of homes and businesses whose well water exceeds the health advisory level, and who use their water for drinking or cooking, if any such wells are identified. Please feel free to contact us if you have questions regarding your results.

Sincerely,

SHANNON & WILSON, INC.

Name
Title

Enc: Select Pages of Test America Laboratory Report No. 320-xxxxx
PFAS Fact Sheet – Nome Airport

2355 HILL ROAD
FAIRBANKS, ALASKA 99709-5326
907-479-0600 • FAX 907-479-5691

APPENDIX D: GROUNDWATER GRADIENT DATA

Appendix D

Groundwater Gradient Data

CONTENTS

Table D-1 - Groundwater Gradient Calculation Data

Well Name	Measurement Date	Northing	Easting	Top-of-casing Elevation	Depth to Water	Groundwater Elevation
OME-MW01-15	10/31/20	3841381.29	1729376.88	17.12	7.05	10.07
OME-MW01-30	10/31/20	3841382.56	1729374.06	16.93	6.35	10.58
OME-MW02-15	10/31/20	3842374.24	1729202.13	24.39	8.43	15.96
10-28-TWP-07	10/25/20	3841376.94	1727168.34	8.58	8.06	0.52

Notes:

Measurements are in feet.

Vertical survey information is referenced to OME A, a secondary airport control station with a published elevation of 10.85 feet.

Horizontal coordinates are referenced to the Nome Airport coodinate system, per AKSAS Project No. 61413 survey control, Alaska State Plane, North American Datum of 1983 (NAD 83).

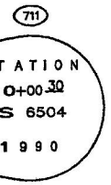
State Plane Coordinate System Alaska Zone 8.

PROJECT CONTROL COORDINATES

POINT	LOCAL SYSTEM		ALASKA STATE PLANE (AK83-8F)		ELEVATION	NAD83(2007) GEODETIC COORDINATES		DESCRIPTION
	NORTHING	EASTING	GRID NORTHING	GRID EASTING		LATITUDE	LONGITUDE	
551	3840181.6769	1729324.9712	3840181.6769	1729324.9712	14.93	64° 30' 26.08071" N	165° 26' 09.13776" W	Found SS Rod in PVC [NGS]: 2 BAD – PACS – (PID DF3650)
552	3841096.5605	1728070.5210	3841096.4735	1728070.6404	10.85	64° 30' 35.19394" N	165° 26' 37.60470" W	Found 3 1/4" Brass Cap: OME A – SACS – (PID DF3651)
553	3842264.7534	1729661.4409	3842264.5550	1729661.4088	53.31	64° 30' 46.55280" N	165° 26' 01.02871" W	Found 3 1/4" Brass Cap: OME B – SACS – (PID DF3652)
554	3840195.1785	1730245.8346	3840195.1772	1730245.7469	13.19	64° 30' 26.13263" N	165° 25' 48.10369" W	Found 3 1/2" Brass Cap: 8756 K – SACS – (PID DF3653)
711	3840155.9327	1726813.2804	3840155.9352	1726813.5194		64° 30' 26.04392" N	165° 27' 06.50673" W	Found 3 1/4" Aluminum Cap [6504–S]: STATION 0+00.30
712	3840742.1041	1729897.0511	3840742.0508	1729896.9967		64° 30' 31.54621" N	165° 25' 55.95773" W	Found 2 1/2" Aluminum Cap [9328–S]: STATION 2+11.99
713	3842721.4110	1724232.4271	3842721.1693	1724232.9118		64° 30' 51.50952" N	165° 28' 04.95928" W	Found 2 1/2" Aluminum Cap [4725–S]: STATION 6+00.62
901	3844345.49	1730478.61	3844345.09	1730478.50		64° 31' 06.9592" N	165° 25' 41.9336" W	Computed from Record: See Note 4

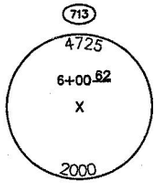
3 1/4" BRASS
N. 0.4' BELOW
UND GOOD
ONDITION

FOUND 3 1/4" BRASS
CAP MON. 0.4' BELOW
GROUND GOOD
CONDITION



1/4" ALUMINUM
ONUMENT 0.6'
W GRADE IN
UMENT CASE

FOUND 2 1/2" ALUMINUM
CAP MONUMENT 0.3'
BELOW GRADE IN
MONUMENT CASE



FOUND 2 1/2" ALUMINUM
CAP MONUMENT 0.4'
BELOW GRADE IN
MONUMENT CASE

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SURVEYS PERFORMED BY R&M
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. 2012.

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VN FOR ORIENTATION PURPOSES

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AND PUBLIC FACILITIES NORTHERN
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10–28) AND "SOUTH" (RUNWAY

AND ALL RECOVERED MONUMENT
ING STATIC GPS TECHNIQUES WITH
IVERS. THE GPS VECTORS WERE
EAST SQUARES METHODS USING
OFTWARE. ALL VECTORS WERE
7) VALUES AT THE NOME AIRPORT
ON (PACS) "2 BAD" (NGS PID NO.
ONG 165°26'09.13776"W.

IT

ENT

HORIZONTAL CONTROL NOTES

1. THIS PROJECT IS LOCATED ENTIRELY WITHIN THE NOME AIRPORT COORDINATE SYSTEM.
2. THE NOME AIRPORT COORDINATE SYSTEM IS A MODIFIED STATE PLANE GROUND BASED COORDINATE SYSTEM WHEREIN THE NAD83(2007) ZONE 8 ALASKA STATE PLANE COORDINATES ARE SCALED ABOUT THE NGS PRIMARY AIRPORT CONTROL STATION (PACS) MONUMENT "2 BAD" USING A COMBINED SCALE FACTOR OF 1.00009517906.
3. THE NGS PACS MONUMENT "2 BAD" IS A 5/8" STAINLESS STEEL DRIVE ROD INSIDE A 5" PVC PIPE FOUND AS DESCRIBED IN THE NGS DATASHEET.

   "2 BAD" HAS NAD83(2007) GEODETIC COORDINATES:

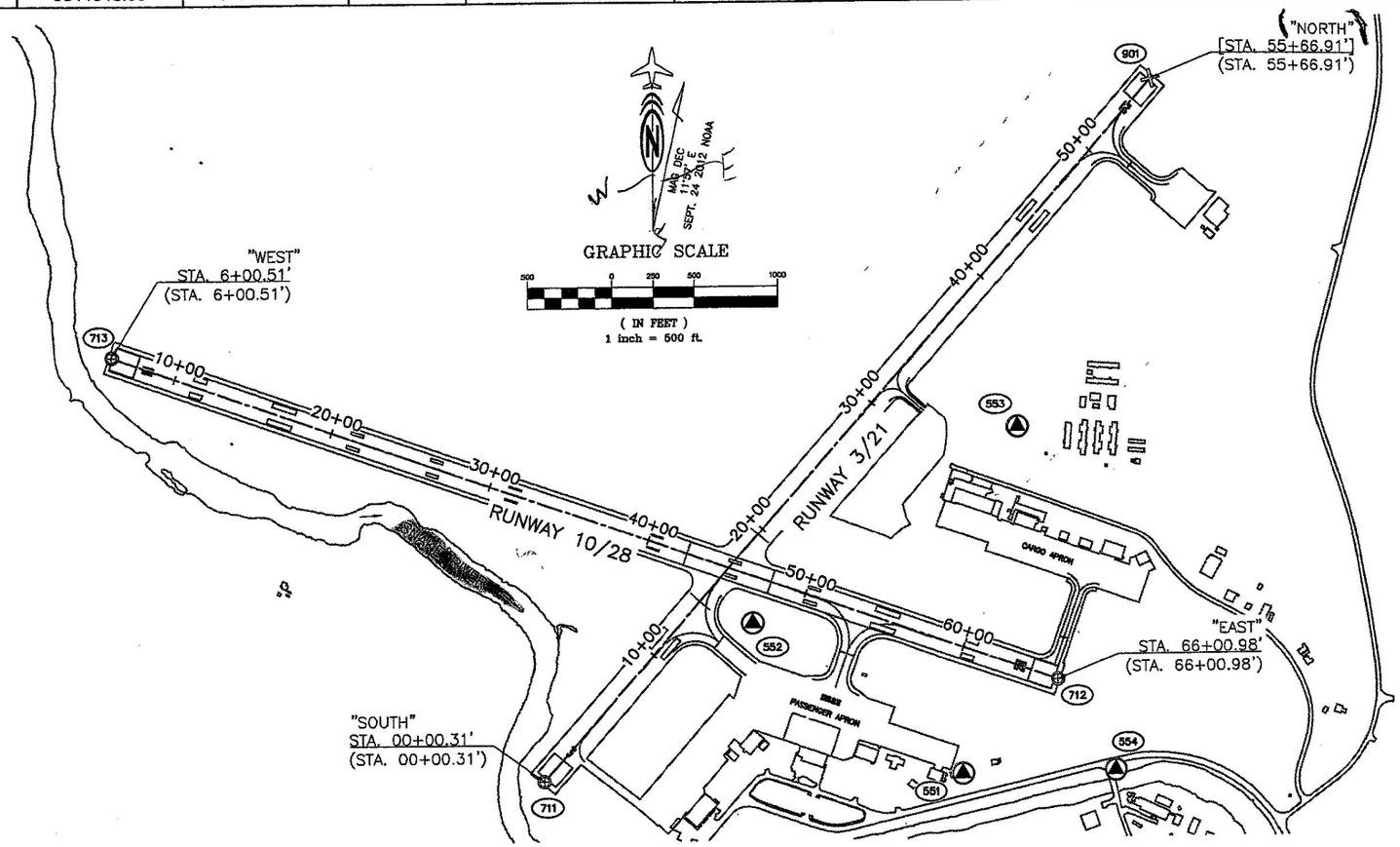
   LATITUDE: 64°30'26.08071"N
   ELLIPSOID HEIGHT(GRS80): 35.32'

   LONGITUDE 165°26'09.13776"W
4. THE NOME AIRPORT COORDINATE SYSTEM WAS CREATED IN 2009, PRIOR TO THE NAD83(2011) READJUSTMENT. THIS COORDINATE SYSTEM IS BASED OFF OF THE NOW SUPERCEDED NAD83(2007) COORDINATES FOR THE PACS AND SACS.

VERTICAL CONTROL NOTES

1. THE BASIS OF ELEVATIONS IS THE NAVD88 ELEVATION OF THE NGS PACS MONUMENT '2 BAD' EXPRESSED IN U.S. FEET.

   "2 BAD" HAS A PUBLISHED ELEVATION VALUE OF 14.93'.
2. PROJECT ELEVATIONS WERE ESTABLISHED BY CLOSED LOOP DIFFERENTIAL LEVELS RUN FROM THE NGS PACS MONUMENT "2 BAD."



SURVEYOR'S CERTIFICATE

I, WILLIAM N. PRESTON, HEREBY CERTIFY THAT I AM A REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF ALASKA AND THAT THIS PLAT REPRESENTS A SURVEY MADE BY ME OR UNDER MY DIRECT SUPERVISION, AND THAT THE MONUMENTS SHOWN ON THIS PLAT ACTUALLY EXIST AS DESCRIBED, AND THAT ALL DIMENSIONS AND OTHER DETAILS ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

WILLIAM N. PRESTON, L.S. 11797

8/13/2013
DATE

Inputs

Example Data Set 1 | Example Data Set 2 | Calculate | Clear

Save Data | Recall Data | Go Back

Site Name: Nome Airport

Date: 1/12/21 | Current Date

Calculation basis: Head

Coordinates: ft

I.D.	x-coordinate	y-coordinate	head (ft)
1) OME-MW01-15	3841381.29	1729376.88	10.07
2) OME-MW01-30	3841382.56	1729374.06	10.58
3) OME-MW02-15	3842374.24	1729202.13	15.96
4) 10-28-TWP-07	3841376.94	1727168.34	0.52
5)			
6)			
7)			
8)			
9)			
10)			
11)			
12)			

Results

Number of Points Used in Calculation	4
Max. Difference Between Head Values	4.706
Gradient Magnitude (i)	0.007826
Flow direction as degrees from North (positive y axis)	235.5
Coefficient of Determination (R^2)	0.999

APPENDIX E: ANALYTICAL RESULTS

Appendix E

Analytical Results

and QA/QC Summary

CONTENTS

- Quality Assurance/Quality control (QA/QC) Summary
- Eurofins TestAmerica Laboratories, Sacramento and SGS North America, Inc. Laboratory Reports
- DEC Laboratory Data Review Checklists (LDRCs)

APPENDIX E: ANALYTICAL RESULTS

QUALITY ASSURANCE (QA) / QUALITY CONTROL (QC) SUMMARY

This appendix summarizes Shannon & Wilson's review of analytical sample results for the Nome Airport PFAS Site Characterization project. Laboratory QC procedures included evaluating surrogate recovery, performing continuing calibration checks, analyzing method blanks, and checking laboratory control samples to assess the accuracy and precision of the analytical methods. The laboratory reports, including case narratives describing laboratory QA results, are appended.

Shannon & Wilson reviewed nine laboratory reports prepared by Eurofins TestAmerica Laboratories, Sacramento (TestAmerica) and SGS North America, Inc. (SGS) to evaluate compliance with project data quality objectives following the Alaska Department of Environmental Conservation's (DEC's) laboratory data review checklist (LDRC). These work orders are detailed in Exhibit C-1.

Exhibit E-8: Laboratory work order summary

Laboratory	Work Order	Sample Type	Included Analyses
TestAmerica	320-66140-1	Soil	PFAS (EPA 537 Modified)
TestAmerica	320-66141-1	Soil	PFAS (EPA 537 Modified)
TestAmerica	320-66142-1	Soil	PFAS (EPA 537 Modified)
TestAmerica	320-66250-1	Soil	PFAS (EPA 537 Modified)
SGS	1206052	Soil	GRO (AK101), BTEX (SW8260D), DRO (AK102), RRO (103), PAHs (SW8270D SIM)
TestAmerica	320-66139-1	Water	PFAS (EPA 537 Modified)
TestAmerica	320-66143-1	Water	PFAS (EPA 537 Modified)
TestAmerica	320-66252-1	Water	PFAS (EPA 537 Modified and EPA 537.1)
SGS	1206053	Water	GRO (AK101), BTEX (SW8260D), DRO (AK102), RRO (103), PAHs (SW8270D SIM)

E.1 ANALYTICAL QUALITY ASSURANCE AND QUALITY CONTROL

QA/QC procedures assist in producing data of acceptable quality and reliability. Analytical results for laboratory QC samples were reviewed and a QA assessment of the data was conducted as the data were generated. The QA review procedures provided documentation of the accuracy and precision of the analytical data and confirmed that the analyses were sufficiently sensitive to detect analytes at levels below applicable DEC soil or groundwater cleanup levels and other regulatory limits, where such limits exist.

Shannon & Wilson conducted a QA/QC review of the laboratory reports containing data for this submittal. The laboratories apply the letter 'J' to a detection less than the limit of quantitation (LOQ) but greater than the detection limit; this "flagged" datum is considered an estimated concentration. TestAmerica refers to the LOQ as the reporting limit (RL). Shannon & Wilson applied a standardized set of flags to data brought into question during the review.

Data flags applied to perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA), gasoline range organics (GRO), diesel range organics (DRO), and residual range organics (RRO) analytical results are described as follows. There were no QA/QC errors associated with the benzene, toluene, ethylbenzene, and xylenes (BTEX) or polynuclear aromatic hydrocarbons (PAH) data. Additional details regarding data quality flags applied to the analytical results are described in the appended LDRCs.

E.2 SAMPLE HANDLING

Samples collected by Shannon & Wilson personnel were shipped via Alaska Air Cargo to the TestAmerica in West Sacramento, California or SGS in Anchorage, Alaska to perform the requested analyses, using the methods specified in the chain-of-custody records. Sample-receipt forms provided by the laboratories were reviewed and checked to verify samples were received in good condition and within the acceptable temperature range. The DEC considers samples received free of ice and at temperatures between 0 °C and 6 °C as acceptable.

Samples were generally received in good condition and properly preserved; with the following exception:

- The MW sample *OME-MW02-15*, associated with work order 1206053, was received by the SGS within the required temperature range but was noted to have ice in the sample containers designated for DRO and RRO analyses. The DRO and RRO results of this sample may be affected by the presence of ice; however, these results are also affected and qualified for contamination introduced by the laboratory as shown in the associated method blank.

Chain-of-custody records were also reviewed to confirm the information was complete, custody was not breached, and samples were analyzed within the acceptable holding time. chain-of-custody records were complete and correct, except for minor labeling discrepancies that did not affect the results. The analyses were performed within their method required holding times, with the following exception:

- The PFOS results of the sediment samples included in work order 320-66140-1 were reported from a re-analysis that was conducted outside of the method required holding time. The samples were re-analyzed due to compounding QC failures in the initial analytical run. However, this result is also qualified for contamination introduced by the laboratory as shown in the associated method blank.

E.3 ANALYTICAL SENSITIVITY

Reporting limits for regulated analytes were below DEC cleanup levels other applicable regulatory limits for the samples included in these work orders (see Section 1.4).

E.4 LABORATORY METHOD BLANKS

Laboratory method blanks (MBs) were analyzed in association with samples collected for this project to check for contributions to the analytical results possibly attributable to laboratory-based contamination. Field sample results are considered potentially impacted if they are included in the same preparatory batch as an MB exhibiting analyte detections and have corresponding detections for those analytes. Affected sample concentrations within five times (non-PFAS) or ten times (PFAS) of those reported in the MB are assumed to be false-positives and are flagged 'UB' at the sample concentration or LOQ, whichever is greater. For non-PFAS analyses, affected sample concentrations within ten times those reported in the MB are assumed to have a high analytical bias and are flagged 'JH'.

- PFOS was detected in the MB samples associated with work order 320-66140-1. The PFOS results of the sediment samples *SD-01*, *SD-02*, *SD-03*, *SD-04*, *SD-06*, *SD-08*, *SD-09*, *SD-10*, *SD-11*, and *SD-12* were roughly equivalent to the concentration detected in the MB and are assumed to be false-positives attributable to laboratory contamination.
- PFOS was detected at an estimated concentration in the MB sample associated with work order 320-66143-1. The PFOS results of the groundwater samples *10-28-TWP-02*, *10-28-TWP-07*, and *10-28-TWP-08* were roughly equivalent to the concentration detected in the MB and are assumed to be false-positives attributable to laboratory contamination.
- PFOS was detected at an estimated concentration in the MB sample associated with work order 320-66250-1. The PFOS results of the surface soil samples *SS-26*, *SS-27*, *SS-28*, *SS-29*, and *SS-31* were roughly equivalent to the concentration detected in the MB and are assumed to be false-positives attributable to laboratory contamination.

- GRO were detected in the MB samples associated with work order 1206052. The GRO results of the soil samples *ARFF-SB1-03*, *ARFF-SB1-13*, *ARFF-SB2-03*, *ARFF-SB3-03*, *ARFF-SB4-03*, *10-28-SB4-03*, *SS-08*, *SS-09*, *SS-10*, *SS-11*, *SS-12*, *SS-13*, *SS-14*, *SS-15*, *SS-16*, and *SS-17* were roughly equivalent to the concentration detected in the MB and are assumed to be false-positives attributable to laboratory contamination.

E.5 TRIP, EQUIPMENT, AND FIELD BLANK SAMPLES

Trip blanks were submitted with the samples marked for volatile analyses to verify cross-contamination did not occur during sample handling and transport. Equipment blanks were submitted with the samples that were collected with reusable equipment to verify that the sampling equipment employed did not introduce analyte contributions to the sample results. Field blanks were collected to verify that the ambient environmental conditions and sampler personal protective equipment did not introduce PFAS contributions to the sample results.

As with MBs, field sample results are considered potentially impacted if the detected sample concentration for the analyte found in the blank sample is within five or ten times that of the blank concentration. Sample results within five times that of a blank concentration are considered not detected and flagged "UB" at the detected concentration or LOQ, whichever is greater.

- GRO were detected at an estimated concentration in the trip blank sample associated with work order 1206052. However, the trip blank detection was determined to be a false positive due to it being analyzed in the same preparatory batch as a MB exhibiting an equivalent detection. The project sample results were not affected.
- GRO were detected at an estimated concentration in the trip blank sample associated with work order 1206053. The GRO results of the groundwater samples *ANG-TWP-01* and *ANG-TWP-02* were roughly equivalent to the concentration detected in the trip blank and are assumed to be false-positives attributable to analyte contributions from external sources.
- GRO, naphthalene, DRO, and/or RRO were detected at estimated concentrations in the equipment blank samples associated with work order 1206053. The DRO and RRO results of groundwater samples *OME-MW01-15*, *OME-MW02-15*, and *OME-MW03-15* were within five time those of the concentrations detected in the equipment blank. Similarly, the GRO result of sample *OME-MW01-15* was also within five times that of the concentration detected in the equipment blank. These results are assumed to be false-positives attributable to contamination present on the submersible pump.

E.6 METHOD ACCURACY AND PRECISION

In order to evaluate the accuracy and precision of the analytical methods, the laboratory analyzed QC samples for each preparatory batch. These QC samples consist of laboratory control samples (LCS) and LCS duplicates (LCSD), matrix spike (MS) and MS duplicates (MSD) samples. Shannon & Wilson reviewed the results of the laboratory QC samples to verify that the reported accuracy and precision were within acceptable limits. The review identified several QC failures which affected the data (see LDRCs for details). Results affected by method precision failures are flagged 'J' while results affected by high method recovery are flagged 'JH' in the summary tables. Similarly, results affected by low method recovery are flagged 'JL' for detected analyte concentrations or 'UJ' for non-detect results.

- The 4,8-dioxa-3H-perfluorononanoic acid (ADONA) results of the sediment samples *SD-01*, *SD-02*, *SD-03*, *SD-04*, *SD-06*, *SD-08*, *SD-09*, *SD-10*, *SD-11*, *SD-12*, and *SD-13* were affected by low method recovery as identified in the corresponding LCS reported in work order 320-66140-1. Since ADONA was not detected in these samples, these non-detect results are considered estimated.
- The perfluorodecanoic acid (PFUnA) result of the sediment sample *SD-13*, reported in work order 320-66141-1, was affected by high method recovery as identified in the corresponding MSD sample.
- The non-detect perfluorotetradecanoic acid (PFTeA) results of the water samples *AKA-TWP-01*, *ANG-TWP-01*, *ANG-TWP-02*, *GP-TWP-01*, *MW-5*, *MW-6*, *MW-D5-01*, *OME-MW01-15*, *OME-MW01-30*, *OME-MW02-15*, and *OME-MW03-15*, reported in work order 320-66252-1, were affected by a method precision failure identified in the RPD for the corresponding LCS/LCSD.

E.7 SURROGATE RECOVERY

The laboratory spiked the samples analyzed for organic constituents with a known quantity of a surrogate compound or isotope dilution analyte similar to the target analytes. The recoveries of these surrogates or isotopes are provided with the sample results in the associated laboratory reports. Shannon & Wilson reviewed the provided surrogate and isotope recovery information to verify the recoveries were within the control limits for the given method. The review did not identify any surrogate nor isotope dilution analyte recovery failures that affected the data.

E.8 FIELD SAMPLE REPRESENTATIVENESS

The overall representativeness of the sample results was evaluated by analyzing the amount of agreement between the detected results field duplicate samples. The agreement was determined by calculating the relative percent difference between the detected results of the

field duplicate pairs. Results affected by relative percent difference failures are flagged 'J' in the results summary table unless previously qualified for more serious QC issues.

- The RRO results of the field duplicate samples *OME-MW02-15* and *OME-MW03-15*, reported in work order 1206053, did not meet the data quality objective of 30 percent for groundwater samples. However, these results were affected and qualified for an equipment blank detection and no further flags were applied.

E.9 OTHER QUALIFIER

The PFOS concentrations reported for the groundwater samples *10-28-TWP-05* and *10-28-TWP-06* are considered estimated and flagged 'J' because the transition mass ratio did not meet laboratory acceptance criteria. This issue is typically observed due to matrix interference. The laboratory analyst used professional judgement to identify the analyte but there is some degree of uncertainty in this determination.

C.10 DATA QUALITY SUMMARY

By working in general accordance with the proposed scope of services, Shannon & Wilson considers the samples we collected for this project to be representative of site conditions at the locations and times they were obtained. Based on this QA review, no samples were rejected as unusable due to QC failures, surpassing the completeness goal of obtaining 85 percent useable data. In general, the quality of the analytical data for this project does not appear to have been compromised by analytical irregularities and is adequate for the purposes of this assessment. Results that are affected by QC anomalies are qualified with the appropriate flags in the analytical data tables.

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

Laboratory Job ID: 320-66139-1
Client Project/Site: OME

For:
Shannon & Wilson, Inc
2355 Hill Rd.
Fairbanks, Alaska 99709-5244

Attn: Marcy Nadel

Authorized for release by:
11/4/2020 8:30:04 AM

David Alltucker, Project Manager I
(916)374-4383
David.Alltucker@Eurofinset.com

Table of Contents

Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

Qualifiers

LCMS

Qualifier	Qualifier Description
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.
¤	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

Job ID: 320-66139-1

Laboratory: Eurofins TestAmerica, Sacramento

Narrative

Job Narrative
320-66139-1

Receipt
The samples were received on 10/29/2020 10:55 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.6º C.

Receipt Exceptions

The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): SW-08 (320-66139-8). The container labels listed incorrect.. Client label time was listed 12:24 for 2 of 2 while the COC is listed 12:25. Logged in according to the COC.

LCMS
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 320-426954.

Method 3535: The following samples contain floating particulates in the bottles prior to extraction: SW-06 (320-66139-6) and SW-09 (320-66139-9).

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: OME

Job ID: 320-66139-1

Client Sample ID: SW-01 — Lab Sample ID: 320-66139-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	6.3		1.7	0.51	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.5		1.7	0.22	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.7		1.7	0.74	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.9		1.7	0.17	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	13		1.7	0.50	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	8.7		1.7	0.47	ng/L	1		537 (modified)	Total/NA

Client Sample ID: SW-02 — Lab Sample ID: 320-66139-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	2.2		1.9	0.56	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.3	J	1.9	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.90	J	1.9	0.82	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.50	J	1.9	0.19	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.4		1.9	0.55	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	5.6		1.9	0.52	ng/L	1		537 (modified)	Total/NA

Client Sample ID: SW-03 — Lab Sample ID: 320-66139-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	2.3		1.8	0.53	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.3	J	1.8	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.92	J	1.8	0.77	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.41	J	1.8	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.3		1.8	0.52	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	5.0		1.8	0.49	ng/L	1		537 (modified)	Total/NA

Client Sample ID: SW-04 — Lab Sample ID: 320-66139-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	1.2	J	1.9	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.54	J	1.9	0.53	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.2	J	1.9	0.50	ng/L	1		537 (modified)	Total/NA

Client Sample ID: SW-05 — Lab Sample ID: 320-66139-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	5.1		1.7	0.50	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.1		1.7	0.22	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	2.2		1.7	0.74	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.3	J	1.7	0.17	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	8.4		1.7	0.50	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	17		1.7	0.47	ng/L	1		537 (modified)	Total/NA

Client Sample ID: SW-06 — Lab Sample ID: 320-66139-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	13		1.8	0.53	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	5.3		1.8	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	3.7		1.8	0.78	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.7	J	1.8	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	13		1.8	0.53	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	41		1.8	0.50	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

Client Sample ID: SW-07 — Lab Sample ID: 320-66139-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	7.2		1.9	0.56	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.5		1.9	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	2.0		1.9	0.82	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.6	J	1.9	0.19	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	9.8		1.9	0.55	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	15		1.9	0.52	ng/L	1		537 (modified)	Total/NA

Client Sample ID: SW-08 — Lab Sample ID: 320-66139-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	11		1.9	0.55	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.5		1.9	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.7	J	1.9	0.80	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	3.0		1.9	0.19	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	14		1.9	0.54	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	8.2		1.9	0.51	ng/L	1		537 (modified)	Total/NA

Client Sample ID: SW-09 — Lab Sample ID: 320-66139-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	12		1.9	0.54	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.0		1.9	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	2.2		1.9	0.79	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	3.0		1.9	0.19	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	13		1.9	0.53	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	9.4		1.9	0.51	ng/L	1		537 (modified)	Total/NA

Client Sample ID: SW-10 — Lab Sample ID: 320-66139-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	3.7		1.8	0.54	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.6	J	1.8	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.2	J	1.8	0.79	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.2	J	1.8	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.6		1.8	0.53	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	18		1.8	0.50	ng/L	1		537 (modified)	Total/NA

Client Sample ID: SW-11 — Lab Sample ID: 320-66139-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	3.9		1.9	0.55	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.8	J	1.9	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.4	J	1.9	0.80	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.0	J	1.9	0.19	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.3		1.9	0.54	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	17		1.9	0.51	ng/L	1		537 (modified)	Total/NA

Client Sample ID: SW-13 — Lab Sample ID: 320-66139-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	33		2.0	0.58	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	7.0		2.0	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	9.3		2.0	0.85	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento

Client Sample ID: SW-13 (Continued) — Lab Sample ID: 320-66139-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorononanoic acid (PFNA)	3.3		2.0	0.27	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	3.1		2.0	0.31	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	2.5		2.0	0.20	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	13		2.0	0.57	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	150		2.0	0.54	ng/L	1		537 (modified)	Total/NA

Client Sample ID: SW-12 — Lab Sample ID: 320-66139-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	4.3		2.0	0.58	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.9	J	2.0	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.4	J	2.0	0.85	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.7	J	2.0	0.20	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	9.8		2.0	0.57	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	18		2.0	0.54	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

Client Sample ID: SW-01

Date Collected: 10/20/20 16:09
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-1

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**6.3**		1.7	0.51	ng/L		10/30/20 11:54	11/01/20 18:13	1
Perfluoroheptanoic acid (PFHpA)	**2.5**		1.7	0.22	ng/L		10/30/20 11:54	11/01/20 18:13	1
Perfluorooctanoic acid (PFOA)	**1.7**		1.7	0.74	ng/L		10/30/20 11:54	11/01/20 18:13	1
Perfluorononanoic acid (PFNA)	ND		1.7	0.24	ng/L		10/30/20 11:54	11/01/20 18:13	1
Perfluorodecanoic acid (PFDA)	ND		1.7	0.27	ng/L		10/30/20 11:54	11/01/20 18:13	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.96	ng/L		10/30/20 11:54	11/01/20 18:13	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.48	ng/L		10/30/20 11:54	11/01/20 18:13	1
Perfluorotridecanoic acid (PFTriA)	ND		1.7	1.1	ng/L		10/30/20 11:54	11/01/20 18:13	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.7	0.64	ng/L		10/30/20 11:54	11/01/20 18:13	1
Perfluorobutanesulfonic acid (PFBS)	**1.9**		1.7	0.17	ng/L		10/30/20 11:54	11/01/20 18:13	1
Perfluorohexanesulfonic acid (PFHxS)	**13**		1.7	0.50	ng/L		10/30/20 11:54	11/01/20 18:13	1
Perfluorooctanesulfonic acid (PFOS)	**8.7**		1.7	0.47	ng/L		10/30/20 11:54	11/01/20 18:13	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.4	1.0	ng/L		10/30/20 11:54	11/01/20 18:13	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.4	1.1	ng/L		10/30/20 11:54	11/01/20 18:13	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.7	0.21	ng/L		10/30/20 11:54	11/01/20 18:13	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.5	1.3	ng/L		10/30/20 11:54	11/01/20 18:13	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.7	0.28	ng/L		10/30/20 11:54	11/01/20 18:13	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.7	0.35	ng/L		10/30/20 11:54	11/01/20 18:13	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*81*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:13*	*1*
13C4 PFHpA	*80*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:13*	*1*
13C4 PFOA	*89*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:13*	*1*
13C5 PFNA	*81*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:13*	*1*
13C2 PFDA	*84*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:13*	*1*
13C2 PFUnA	*78*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:13*	*1*
13C2 PFDoA	*70*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:13*	*1*
13C2 PFTeDA	*66*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:13*	*1*
13C3 PFBS	*95*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:13*	*1*
18O2 PFHxS	*93*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:13*	*1*
13C4 PFOS	*94*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:13*	*1*
d3-NMeFOSAA	*95*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:13*	*1*
d5-NEtFOSAA	*105*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:13*	*1*
13C3 HFPO-DA	*83*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:13*	*1*

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

Client Sample ID: SW-02
Date Collected: 10/20/20 16:40
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**2.2**		1.9	0.56	ng/L		10/30/20 11:54	11/01/20 18:23	1
Perfluoroheptanoic acid (PFHpA)	**1.3**	**J**	1.9	0.24	ng/L		10/30/20 11:54	11/01/20 18:23	1
Perfluorooctanoic acid (PFOA)	**0.90**	**J**	1.9	0.82	ng/L		10/30/20 11:54	11/01/20 18:23	1
Perfluorononanoic acid (PFNA)	ND		1.9	0.26	ng/L		10/30/20 11:54	11/01/20 18:23	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.30	ng/L		10/30/20 11:54	11/01/20 18:23	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.1	ng/L		10/30/20 11:54	11/01/20 18:23	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.53	ng/L		10/30/20 11:54	11/01/20 18:23	1
Perfluorotridecanoic acid (PFTriA)	ND		1.9	1.3	ng/L		10/30/20 11:54	11/01/20 18:23	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9	0.71	ng/L		10/30/20 11:54	11/01/20 18:23	1
Perfluorobutanesulfonic acid (PFBS)	**0.50**	**J**	1.9	0.19	ng/L		10/30/20 11:54	11/01/20 18:23	1
Perfluorohexanesulfonic acid (PFHxS)	**2.4**		1.9	0.55	ng/L		10/30/20 11:54	11/01/20 18:23	1
Perfluorooctanesulfonic acid (PFOS)	**5.6**		1.9	0.52	ng/L		10/30/20 11:54	11/01/20 18:23	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.8	1.2	ng/L		10/30/20 11:54	11/01/20 18:23	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.8	1.3	ng/L		10/30/20 11:54	11/01/20 18:23	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.9	0.23	ng/L		10/30/20 11:54	11/01/20 18:23	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.9	1.5	ng/L		10/30/20 11:54	11/01/20 18:23	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.9	0.31	ng/L		10/30/20 11:54	11/01/20 18:23	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.39	ng/L		10/30/20 11:54	11/01/20 18:23	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*79*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:23*	*1*
13C4 PFHpA	*78*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:23*	*1*
13C4 PFOA	*84*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:23*	*1*
13C5 PFNA	*76*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:23*	*1*
13C2 PFDA	*78*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:23*	*1*
13C2 PFUnA	*65*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:23*	*1*
13C2 PFDoA	*61*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:23*	*1*
13C2 PFTeDA	*45*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:23*	*1*
13C3 PFBS	*84*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:23*	*1*
18O2 PFHxS	*88*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:23*	*1*
13C4 PFOS	*82*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:23*	*1*
d3-NMeFOSAA	*85*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:23*	*1*
d5-NEtFOSAA	*87*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:23*	*1*
13C3 HFPO-DA	*80*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:23*	*1*

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

Client Sample ID: SW-03
Date Collected: 10/20/20 16:30
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-3
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**2.3**		1.8	0.53	ng/L		10/30/20 11:54	11/01/20 18:32	1
Perfluoroheptanoic acid (PFHpA)	**1.3**	**J**	1.8	0.23	ng/L		10/30/20 11:54	11/01/20 18:32	1
Perfluorooctanoic acid (PFOA)	**0.92**	**J**	1.8	0.77	ng/L		10/30/20 11:54	11/01/20 18:32	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.25	ng/L		10/30/20 11:54	11/01/20 18:32	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.28	ng/L		10/30/20 11:54	11/01/20 18:32	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	1.0	ng/L		10/30/20 11:54	11/01/20 18:32	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.50	ng/L		10/30/20 11:54	11/01/20 18:32	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		10/30/20 11:54	11/01/20 18:32	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.66	ng/L		10/30/20 11:54	11/01/20 18:32	1
Perfluorobutanesulfonic acid (PFBS)	**0.41**	**J**	1.8	0.18	ng/L		10/30/20 11:54	11/01/20 18:32	1
Perfluorohexanesulfonic acid (PFHxS)	**2.3**		1.8	0.52	ng/L		10/30/20 11:54	11/01/20 18:32	1
Perfluorooctanesulfonic acid (PFOS)	**5.0**		1.8	0.49	ng/L		10/30/20 11:54	11/01/20 18:32	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.5	1.1	ng/L		10/30/20 11:54	11/01/20 18:32	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.5	1.2	ng/L		10/30/20 11:54	11/01/20 18:32	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.8	0.22	ng/L		10/30/20 11:54	11/01/20 18:32	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.6	1.4	ng/L		10/30/20 11:54	11/01/20 18:32	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.8	0.29	ng/L		10/30/20 11:54	11/01/20 18:32	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.8	0.36	ng/L		10/30/20 11:54	11/01/20 18:32	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*70*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:32*	*1*
13C4 PFHpA	*72*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:32*	*1*
13C4 PFOA	*76*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:32*	*1*
13C5 PFNA	*75*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:32*	*1*
13C2 PFDA	*72*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:32*	*1*
13C2 PFUnA	*71*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:32*	*1*
13C2 PFDoA	*62*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:32*	*1*
13C2 PFTeDA	*54*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:32*	*1*
13C3 PFBS	*80*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:32*	*1*
18O2 PFHxS	*84*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:32*	*1*
13C4 PFOS	*84*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:32*	*1*
d3-NMeFOSAA	*89*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:32*	*1*
d5-NEtFOSAA	*97*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:32*	*1*
13C3 HFPO-DA	*71*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:32*	*1*

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

Client Sample ID: SW-04
Date Collected: 10/20/20 17:00
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-4
Matrix: Water

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		10/30/20 11:54	11/01/20 18:41	1
Perfluoroheptanoic acid (PFHpA)	**1.2**	**J**	1.9	0.23	ng/L		10/30/20 11:54	11/01/20 18:41	1
Perfluorooctanoic acid (PFOA)	ND		1.9	0.79	ng/L		10/30/20 11:54	11/01/20 18:41	1
Perfluorononanoic acid (PFNA)	ND		1.9	0.25	ng/L		10/30/20 11:54	11/01/20 18:41	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.29	ng/L		10/30/20 11:54	11/01/20 18:41	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.0	ng/L		10/30/20 11:54	11/01/20 18:41	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.51	ng/L		10/30/20 11:54	11/01/20 18:41	1
Perfluorotridecanoic acid (PFTriA)	ND		1.9	1.2	ng/L		10/30/20 11:54	11/01/20 18:41	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9	0.68	ng/L		10/30/20 11:54	11/01/20 18:41	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.9	0.19	ng/L		10/30/20 11:54	11/01/20 18:41	1
Perfluorohexanesulfonic acid (PFHxS)	**0.54**	**J**	1.9	0.53	ng/L		10/30/20 11:54	11/01/20 18:41	1
Perfluorooctanesulfonic acid (PFOS)	**1.2**	**J**	1.9	0.50	ng/L		10/30/20 11:54	11/01/20 18:41	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.6	1.1	ng/L		10/30/20 11:54	11/01/20 18:41	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.6	1.2	ng/L		10/30/20 11:54	11/01/20 18:41	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.9	0.22	ng/L		10/30/20 11:54	11/01/20 18:41	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.7	1.4	ng/L		10/30/20 11:54	11/01/20 18:41	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.9	0.30	ng/L		10/30/20 11:54	11/01/20 18:41	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.37	ng/L		10/30/20 11:54	11/01/20 18:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*68*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:41*	*1*
13C4 PFHpA	*66*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:41*	*1*
13C4 PFOA	*72*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:41*	*1*
13C5 PFNA	*66*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:41*	*1*
13C2 PFDA	*65*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:41*	*1*
13C2 PFUnA	*67*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:41*	*1*
13C2 PFDoA	*53*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:41*	*1*
13C2 PFTeDA	*63*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:41*	*1*
13C3 PFBS	*76*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:41*	*1*
18O2 PFHxS	*76*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:41*	*1*
13C4 PFOS	*76*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:41*	*1*
d3-NMeFOSAA	*83*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:41*	*1*
d5-NEtFOSAA	*85*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:41*	*1*
13C3 HFPO-DA	*68*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:41*	*1*

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

Client Sample ID: SW-05
Date Collected: 10/20/20 17:30
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-5
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**5.1**		1.7	0.50	ng/L		10/30/20 11:54	11/01/20 18:50	1
Perfluoroheptanoic acid (PFHpA)	**2.1**		1.7	0.22	ng/L		10/30/20 11:54	11/01/20 18:50	1
Perfluorooctanoic acid (PFOA)	**2.2**		1.7	0.74	ng/L		10/30/20 11:54	11/01/20 18:50	1
Perfluorononanoic acid (PFNA)	ND		1.7	0.23	ng/L		10/30/20 11:54	11/01/20 18:50	1
Perfluorodecanoic acid (PFDA)	ND		1.7	0.27	ng/L		10/30/20 11:54	11/01/20 18:50	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.96	ng/L		10/30/20 11:54	11/01/20 18:50	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.48	ng/L		10/30/20 11:54	11/01/20 18:50	1
Perfluorotridecanoic acid (PFTriA)	ND		1.7	1.1	ng/L		10/30/20 11:54	11/01/20 18:50	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.7	0.63	ng/L		10/30/20 11:54	11/01/20 18:50	1
Perfluorobutanesulfonic acid (PFBS)	**1.3**	**J**	1.7	0.17	ng/L		10/30/20 11:54	11/01/20 18:50	1
Perfluorohexanesulfonic acid (PFHxS)	**8.4**		1.7	0.50	ng/L		10/30/20 11:54	11/01/20 18:50	1
Perfluorooctanesulfonic acid (PFOS)	**17**		1.7	0.47	ng/L		10/30/20 11:54	11/01/20 18:50	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.3	1.0	ng/L		10/30/20 11:54	11/01/20 18:50	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.3	1.1	ng/L		10/30/20 11:54	11/01/20 18:50	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.7	0.21	ng/L		10/30/20 11:54	11/01/20 18:50	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.5	1.3	ng/L		10/30/20 11:54	11/01/20 18:50	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.7	0.28	ng/L		10/30/20 11:54	11/01/20 18:50	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.7	0.35	ng/L		10/30/20 11:54	11/01/20 18:50	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*71*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:50*	*1*
13C4 PFHpA	*68*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:50*	*1*
13C4 PFOA	*76*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:50*	*1*
13C5 PFNA	*72*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:50*	*1*
13C2 PFDA	*74*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:50*	*1*
13C2 PFUnA	*70*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:50*	*1*
13C2 PFDoA	*66*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:50*	*1*
13C2 PFTeDA	*57*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:50*	*1*
13C3 PFBS	*80*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:50*	*1*
18O2 PFHxS	*83*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:50*	*1*
13C4 PFOS	*84*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:50*	*1*
d3-NMeFOSAA	*80*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:50*	*1*
d5-NEtFOSAA	*86*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:50*	*1*
13C3 HFPO-DA	*74*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:50*	*1*

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

Client Sample ID: SW-06
Date Collected: 10/22/20 11:45
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-6
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**13**		1.8	0.53	ng/L		10/30/20 11:54	11/01/20 18:59	1
Perfluoroheptanoic acid (PFHpA)	**5.3**		1.8	0.23	ng/L		10/30/20 11:54	11/01/20 18:59	1
Perfluorooctanoic acid (PFOA)	**3.7**		1.8	0.78	ng/L		10/30/20 11:54	11/01/20 18:59	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.25	ng/L		10/30/20 11:54	11/01/20 18:59	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.29	ng/L		10/30/20 11:54	11/01/20 18:59	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	1.0	ng/L		10/30/20 11:54	11/01/20 18:59	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.51	ng/L		10/30/20 11:54	11/01/20 18:59	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		10/30/20 11:54	11/01/20 18:59	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.67	ng/L		10/30/20 11:54	11/01/20 18:59	1
Perfluorobutanesulfonic acid (PFBS)	**1.7**	**J**	1.8	0.18	ng/L		10/30/20 11:54	11/01/20 18:59	1
Perfluorohexanesulfonic acid (PFHxS)	**13**		1.8	0.53	ng/L		10/30/20 11:54	11/01/20 18:59	1
Perfluorooctanesulfonic acid (PFOS)	**41**		1.8	0.50	ng/L		10/30/20 11:54	11/01/20 18:59	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.6	1.1	ng/L		10/30/20 11:54	11/01/20 18:59	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.6	1.2	ng/L		10/30/20 11:54	11/01/20 18:59	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.8	0.22	ng/L		10/30/20 11:54	11/01/20 18:59	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.7	1.4	ng/L		10/30/20 11:54	11/01/20 18:59	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.8	0.29	ng/L		10/30/20 11:54	11/01/20 18:59	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.8	0.37	ng/L		10/30/20 11:54	11/01/20 18:59	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*75*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:59*	*1*
13C4 PFHpA	*75*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:59*	*1*
13C4 PFOA	*82*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:59*	*1*
13C5 PFNA	*76*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:59*	*1*
13C2 PFDA	*82*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:59*	*1*
13C2 PFUnA	*78*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:59*	*1*
13C2 PFDoA	*69*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:59*	*1*
13C2 PFTeDA	*66*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:59*	*1*
13C3 PFBS	*85*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:59*	*1*
18O2 PFHxS	*89*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:59*	*1*
13C4 PFOS	*88*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:59*	*1*
d3-NMeFOSAA	*88*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:59*	*1*
d5-NEtFOSAA	*102*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:59*	*1*
13C3 HFPO-DA	*76*		*25 - 150*	*10/30/20 11:54*	*11/01/20 18:59*	*1*

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

Client Sample ID: SW-07
Date Collected: 10/22/20 12:02
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-7
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**7.2**		1.9	0.56	ng/L		10/30/20 11:54	11/01/20 19:08	1
Perfluoroheptanoic acid (PFHpA)	**2.5**		1.9	0.24	ng/L		10/30/20 11:54	11/01/20 19:08	1
Perfluorooctanoic acid (PFOA)	**2.0**		1.9	0.82	ng/L		10/30/20 11:54	11/01/20 19:08	1
Perfluorononanoic acid (PFNA)	ND		1.9	0.26	ng/L		10/30/20 11:54	11/01/20 19:08	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.30	ng/L		10/30/20 11:54	11/01/20 19:08	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.1	ng/L		10/30/20 11:54	11/01/20 19:08	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.53	ng/L		10/30/20 11:54	11/01/20 19:08	1
Perfluorotridecanoic acid (PFTriA)	ND		1.9	1.2	ng/L		10/30/20 11:54	11/01/20 19:08	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9	0.70	ng/L		10/30/20 11:54	11/01/20 19:08	1
Perfluorobutanesulfonic acid (PFBS)	**1.6**	**J**	1.9	0.19	ng/L		10/30/20 11:54	11/01/20 19:08	1
Perfluorohexanesulfonic acid (PFHxS)	**9.8**		1.9	0.55	ng/L		10/30/20 11:54	11/01/20 19:08	1
Perfluorooctanesulfonic acid (PFOS)	**15**		1.9	0.52	ng/L		10/30/20 11:54	11/01/20 19:08	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.8	1.2	ng/L		10/30/20 11:54	11/01/20 19:08	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.8	1.2	ng/L		10/30/20 11:54	11/01/20 19:08	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.9	0.23	ng/L		10/30/20 11:54	11/01/20 19:08	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.8	1.4	ng/L		10/30/20 11:54	11/01/20 19:08	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.9	0.31	ng/L		10/30/20 11:54	11/01/20 19:08	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.38	ng/L		10/30/20 11:54	11/01/20 19:08	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*78*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:08*	*1*
13C4 PFHpA	*77*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:08*	*1*
13C4 PFOA	*84*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:08*	*1*
13C5 PFNA	*78*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:08*	*1*
13C2 PFDA	*80*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:08*	*1*
13C2 PFUnA	*70*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:08*	*1*
13C2 PFDoA	*69*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:08*	*1*
13C2 PFTeDA	*68*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:08*	*1*
13C3 PFBS	*84*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:08*	*1*
18O2 PFHxS	*90*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:08*	*1*
13C4 PFOS	*84*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:08*	*1*
d3-NMeFOSAA	*90*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:08*	*1*
d5-NEtFOSAA	*97*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:08*	*1*
13C3 HFPO-DA	*79*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:08*	*1*

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

Client Sample ID: SW-08

Date Collected: 10/22/20 12:25
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-8

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**11**		1.9	0.55	ng/L		10/30/20 11:54	11/01/20 19:36	1
Perfluoroheptanoic acid (PFHpA)	**3.5**		1.9	0.24	ng/L		10/30/20 11:54	11/01/20 19:36	1
Perfluorooctanoic acid (PFOA)	**1.7**	**J**	1.9	0.80	ng/L		10/30/20 11:54	11/01/20 19:36	1
Perfluorononanoic acid (PFNA)	ND		1.9	0.25	ng/L		10/30/20 11:54	11/01/20 19:36	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.29	ng/L		10/30/20 11:54	11/01/20 19:36	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.0	ng/L		10/30/20 11:54	11/01/20 19:36	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.52	ng/L		10/30/20 11:54	11/01/20 19:36	1
Perfluorotridecanoic acid (PFTriA)	ND		1.9	1.2	ng/L		10/30/20 11:54	11/01/20 19:36	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9	0.69	ng/L		10/30/20 11:54	11/01/20 19:36	1
Perfluorobutanesulfonic acid (PFBS)	**3.0**		1.9	0.19	ng/L		10/30/20 11:54	11/01/20 19:36	1
Perfluorohexanesulfonic acid (PFHxS)	**14**		1.9	0.54	ng/L		10/30/20 11:54	11/01/20 19:36	1
Perfluorooctanesulfonic acid (PFOS)	**8.2**		1.9	0.51	ng/L		10/30/20 11:54	11/01/20 19:36	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.7	1.1	ng/L		10/30/20 11:54	11/01/20 19:36	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.7	1.2	ng/L		10/30/20 11:54	11/01/20 19:36	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.9	0.23	ng/L		10/30/20 11:54	11/01/20 19:36	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.8	1.4	ng/L		10/30/20 11:54	11/01/20 19:36	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.9	0.30	ng/L		10/30/20 11:54	11/01/20 19:36	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.38	ng/L		10/30/20 11:54	11/01/20 19:36	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*66*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:36*	*1*
13C4 PFHpA	*65*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:36*	*1*
13C4 PFOA	*71*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:36*	*1*
13C5 PFNA	*69*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:36*	*1*
13C2 PFDA	*67*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:36*	*1*
13C2 PFUnA	*63*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:36*	*1*
13C2 PFDoA	*58*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:36*	*1*
13C2 PFTeDA	*62*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:36*	*1*
13C3 PFBS	*73*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:36*	*1*
18O2 PFHxS	*77*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:36*	*1*
13C4 PFOS	*76*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:36*	*1*
d3-NMeFOSAA	*79*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:36*	*1*
d5-NEtFOSAA	*85*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:36*	*1*
13C3 HFPO-DA	*67*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:36*	*1*

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

Client Sample ID: SW-09
Date Collected: 10/22/20 12:40
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-9
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**12**		1.9	0.54	ng/L		10/30/20 11:54	11/01/20 19:45	1
Perfluoroheptanoic acid (PFHpA)	**4.0**		1.9	0.23	ng/L		10/30/20 11:54	11/01/20 19:45	1
Perfluorooctanoic acid (PFOA)	**2.2**		1.9	0.79	ng/L		10/30/20 11:54	11/01/20 19:45	1
Perfluorononanoic acid (PFNA)	ND		1.9	0.25	ng/L		10/30/20 11:54	11/01/20 19:45	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.29	ng/L		10/30/20 11:54	11/01/20 19:45	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.0	ng/L		10/30/20 11:54	11/01/20 19:45	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.51	ng/L		10/30/20 11:54	11/01/20 19:45	1
Perfluorotridecanoic acid (PFTriA)	ND		1.9	1.2	ng/L		10/30/20 11:54	11/01/20 19:45	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9	0.68	ng/L		10/30/20 11:54	11/01/20 19:45	1
Perfluorobutanesulfonic acid (PFBS)	**3.0**		1.9	0.19	ng/L		10/30/20 11:54	11/01/20 19:45	1
Perfluorohexanesulfonic acid (PFHxS)	**13**		1.9	0.53	ng/L		10/30/20 11:54	11/01/20 19:45	1
Perfluorooctanesulfonic acid (PFOS)	**9.4**		1.9	0.51	ng/L		10/30/20 11:54	11/01/20 19:45	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.7	1.1	ng/L		10/30/20 11:54	11/01/20 19:45	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.7	1.2	ng/L		10/30/20 11:54	11/01/20 19:45	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.9	0.22	ng/L		10/30/20 11:54	11/01/20 19:45	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.7	1.4	ng/L		10/30/20 11:54	11/01/20 19:45	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.9	0.30	ng/L		10/30/20 11:54	11/01/20 19:45	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.37	ng/L		10/30/20 11:54	11/01/20 19:45	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*65*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:45*	*1*
13C4 PFHpA	*66*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:45*	*1*
13C4 PFOA	*76*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:45*	*1*
13C5 PFNA	*72*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:45*	*1*
13C2 PFDA	*68*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:45*	*1*
13C2 PFUnA	*67*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:45*	*1*
13C2 PFDoA	*63*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:45*	*1*
13C2 PFTeDA	*58*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:45*	*1*
13C3 PFBS	*76*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:45*	*1*
18O2 PFHxS	*82*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:45*	*1*
13C4 PFOS	*79*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:45*	*1*
d3-NMeFOSAA	*81*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:45*	*1*
d5-NEtFOSAA	*84*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:45*	*1*
13C3 HFPO-DA	*69*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:45*	*1*

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

Client Sample ID: SW-10
Date Collected: 10/22/20 13:15
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-10
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**3.7**		1.8	0.54	ng/L		10/30/20 11:54	11/01/20 19:54	1
Perfluoroheptanoic acid (PFHpA)	**1.6**	**J**	1.8	0.23	ng/L		10/30/20 11:54	11/01/20 19:54	1
Perfluorooctanoic acid (PFOA)	**1.2**	**J**	1.8	0.79	ng/L		10/30/20 11:54	11/01/20 19:54	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.25	ng/L		10/30/20 11:54	11/01/20 19:54	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.29	ng/L		10/30/20 11:54	11/01/20 19:54	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	1.0	ng/L		10/30/20 11:54	11/01/20 19:54	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.51	ng/L		10/30/20 11:54	11/01/20 19:54	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		10/30/20 11:54	11/01/20 19:54	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.67	ng/L		10/30/20 11:54	11/01/20 19:54	1
Perfluorobutanesulfonic acid (PFBS)	**1.2**	**J**	1.8	0.18	ng/L		10/30/20 11:54	11/01/20 19:54	1
Perfluorohexanesulfonic acid (PFHxS)	**6.6**		1.8	0.53	ng/L		10/30/20 11:54	11/01/20 19:54	1
Perfluorooctanesulfonic acid (PFOS)	**18**		1.8	0.50	ng/L		10/30/20 11:54	11/01/20 19:54	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.6	1.1	ng/L		10/30/20 11:54	11/01/20 19:54	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.6	1.2	ng/L		10/30/20 11:54	11/01/20 19:54	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.8	0.22	ng/L		10/30/20 11:54	11/01/20 19:54	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.7	1.4	ng/L		10/30/20 11:54	11/01/20 19:54	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.8	0.30	ng/L		10/30/20 11:54	11/01/20 19:54	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.8	0.37	ng/L		10/30/20 11:54	11/01/20 19:54	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*68*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:54*	*1*
13C4 PFHpA	*68*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:54*	*1*
13C4 PFOA	*72*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:54*	*1*
13C5 PFNA	*73*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:54*	*1*
13C2 PFDA	*71*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:54*	*1*
13C2 PFUnA	*68*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:54*	*1*
13C2 PFDoA	*70*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:54*	*1*
13C2 PFTeDA	*60*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:54*	*1*
13C3 PFBS	*76*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:54*	*1*
18O2 PFHxS	*80*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:54*	*1*
13C4 PFOS	*84*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:54*	*1*
d3-NMeFOSAA	*80*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:54*	*1*
d5-NEtFOSAA	*85*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:54*	*1*
13C3 HFPO-DA	*72*		*25 - 150*	*10/30/20 11:54*	*11/01/20 19:54*	*1*

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

Client Sample ID: SW-11
Date Collected: 10/22/20 13:05
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-11
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**3.9**		1.9	0.55	ng/L		10/30/20 11:54	11/01/20 20:03	1
Perfluoroheptanoic acid (PFHpA)	**1.8**	**J**	1.9	0.24	ng/L		10/30/20 11:54	11/01/20 20:03	1
Perfluorooctanoic acid (PFOA)	**1.4**	**J**	1.9	0.80	ng/L		10/30/20 11:54	11/01/20 20:03	1
Perfluorononanoic acid (PFNA)	ND		1.9	0.25	ng/L		10/30/20 11:54	11/01/20 20:03	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.29	ng/L		10/30/20 11:54	11/01/20 20:03	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.0	ng/L		10/30/20 11:54	11/01/20 20:03	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.52	ng/L		10/30/20 11:54	11/01/20 20:03	1
Perfluorotridecanoic acid (PFTriA)	ND		1.9	1.2	ng/L		10/30/20 11:54	11/01/20 20:03	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9	0.69	ng/L		10/30/20 11:54	11/01/20 20:03	1
Perfluorobutanesulfonic acid (PFBS)	**1.0**	**J**	1.9	0.19	ng/L		10/30/20 11:54	11/01/20 20:03	1
Perfluorohexanesulfonic acid (PFHxS)	**6.3**		1.9	0.54	ng/L		10/30/20 11:54	11/01/20 20:03	1
Perfluorooctanesulfonic acid (PFOS)	**17**		1.9	0.51	ng/L		10/30/20 11:54	11/01/20 20:03	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.7	1.1	ng/L		10/30/20 11:54	11/01/20 20:03	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.7	1.2	ng/L		10/30/20 11:54	11/01/20 20:03	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.9	0.23	ng/L		10/30/20 11:54	11/01/20 20:03	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.8	1.4	ng/L		10/30/20 11:54	11/01/20 20:03	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.9	0.30	ng/L		10/30/20 11:54	11/01/20 20:03	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.38	ng/L		10/30/20 11:54	11/01/20 20:03	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*79*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:03*	*1*
13C4 PFHpA	*80*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:03*	*1*
13C4 PFOA	*89*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:03*	*1*
13C5 PFNA	*85*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:03*	*1*
13C2 PFDA	*83*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:03*	*1*
13C2 PFUnA	*81*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:03*	*1*
13C2 PFDoA	*79*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:03*	*1*
13C2 PFTeDA	*64*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:03*	*1*
13C3 PFBS	*82*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:03*	*1*
18O2 PFHxS	*91*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:03*	*1*
13C4 PFOS	*91*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:03*	*1*
d3-NMeFOSAA	*94*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:03*	*1*
d5-NEtFOSAA	*97*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:03*	*1*
13C3 HFPO-DA	*81*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:03*	*1*

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

Client Sample ID: SW-13

Date Collected: 10/22/20 14:01
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-12

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**33**		2.0	0.58	ng/L		10/30/20 11:54	11/01/20 20:12	1
Perfluoroheptanoic acid (PFHpA)	**7.0**		2.0	0.25	ng/L		10/30/20 11:54	11/01/20 20:12	1
Perfluorooctanoic acid (PFOA)	**9.3**		2.0	0.85	ng/L		10/30/20 11:54	11/01/20 20:12	1
Perfluorononanoic acid (PFNA)	**3.3**		2.0	0.27	ng/L		10/30/20 11:54	11/01/20 20:12	1
Perfluorodecanoic acid (PFDA)	**3.1**		2.0	0.31	ng/L		10/30/20 11:54	11/01/20 20:12	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		10/30/20 11:54	11/01/20 20:12	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.55	ng/L		10/30/20 11:54	11/01/20 20:12	1
Perfluorotridecanoic acid (PFTriA)	ND		2.0	1.3	ng/L		10/30/20 11:54	11/01/20 20:12	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.73	ng/L		10/30/20 11:54	11/01/20 20:12	1
Perfluorobutanesulfonic acid (PFBS)	**2.5**		2.0	0.20	ng/L		10/30/20 11:54	11/01/20 20:12	1
Perfluorohexanesulfonic acid (PFHxS)	**13**		2.0	0.57	ng/L		10/30/20 11:54	11/01/20 20:12	1
Perfluorooctanesulfonic acid (PFOS)	**150**		2.0	0.54	ng/L		10/30/20 11:54	11/01/20 20:12	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		5.0	1.2	ng/L		10/30/20 11:54	11/01/20 20:12	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		5.0	1.3	ng/L		10/30/20 11:54	11/01/20 20:12	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.0	0.24	ng/L		10/30/20 11:54	11/01/20 20:12	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		4.0	1.5	ng/L		10/30/20 11:54	11/01/20 20:12	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.0	0.32	ng/L		10/30/20 11:54	11/01/20 20:12	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0	0.40	ng/L		10/30/20 11:54	11/01/20 20:12	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*80*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:12*	*1*
13C4 PFHpA	*81*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:12*	*1*
13C4 PFOA	*84*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:12*	*1*
13C5 PFNA	*81*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:12*	*1*
13C2 PFDA	*86*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:12*	*1*
13C2 PFUnA	*80*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:12*	*1*
13C2 PFDoA	*66*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:12*	*1*
13C2 PFTeDA	*68*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:12*	*1*
13C3 PFBS	*94*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:12*	*1*
18O2 PFHxS	*95*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:12*	*1*
13C4 PFOS	*90*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:12*	*1*
d3-NMeFOSAA	*89*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:12*	*1*
d5-NEtFOSAA	*102*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:12*	*1*
13C3 HFPO-DA	*82*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:12*	*1*

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

Client Sample ID: SW-12

Date Collected: 10/22/20 13:45
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-13

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**4.3**		2.0	0.58	ng/L		10/30/20 11:54	11/01/20 20:21	1
Perfluoroheptanoic acid (PFHpA)	**1.9**	**J**	2.0	0.25	ng/L		10/30/20 11:54	11/01/20 20:21	1
Perfluorooctanoic acid (PFOA)	**1.4**	**J**	2.0	0.85	ng/L		10/30/20 11:54	11/01/20 20:21	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.27	ng/L		10/30/20 11:54	11/01/20 20:21	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.31	ng/L		10/30/20 11:54	11/01/20 20:21	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		10/30/20 11:54	11/01/20 20:21	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.55	ng/L		10/30/20 11:54	11/01/20 20:21	1
Perfluorotridecanoic acid (PFTriA)	ND		2.0	1.3	ng/L		10/30/20 11:54	11/01/20 20:21	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.73	ng/L		10/30/20 11:54	11/01/20 20:21	1
Perfluorobutanesulfonic acid (PFBS)	**1.7**	**J**	2.0	0.20	ng/L		10/30/20 11:54	11/01/20 20:21	1
Perfluorohexanesulfonic acid (PFHxS)	**9.8**		2.0	0.57	ng/L		10/30/20 11:54	11/01/20 20:21	1
Perfluorooctanesulfonic acid (PFOS)	**18**		2.0	0.54	ng/L		10/30/20 11:54	11/01/20 20:21	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		5.0	1.2	ng/L		10/30/20 11:54	11/01/20 20:21	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		5.0	1.3	ng/L		10/30/20 11:54	11/01/20 20:21	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.0	0.24	ng/L		10/30/20 11:54	11/01/20 20:21	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		4.0	1.5	ng/L		10/30/20 11:54	11/01/20 20:21	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.0	0.32	ng/L		10/30/20 11:54	11/01/20 20:21	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0	0.40	ng/L		10/30/20 11:54	11/01/20 20:21	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*72*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:21*	*1*
13C4 PFHpA	*76*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:21*	*1*
13C4 PFOA	*84*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:21*	*1*
13C5 PFNA	*75*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:21*	*1*
13C2 PFDA	*79*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:21*	*1*
13C2 PFUnA	*79*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:21*	*1*
13C2 PFDoA	*82*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:21*	*1*
13C2 PFTeDA	*69*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:21*	*1*
13C3 PFBS	*84*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:21*	*1*
18O2 PFHxS	*91*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:21*	*1*
13C4 PFOS	*93*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:21*	*1*
d3-NMeFOSAA	*88*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:21*	*1*
d5-NEtFOSAA	*96*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:21*	*1*
13C3 HFPO-DA	*75*		*25 - 150*	*10/30/20 11:54*	*11/01/20 20:21*	*1*

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

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)	PFDoA (25-150)	PFTDA (25-150)
320-66139-1	SW-01	81	80	89	81	84	78	70	66
320-66139-2	SW-02	79	78	84	76	78	65	61	45
320-66139-3	SW-03	70	72	76	75	72	71	62	54
320-66139-4	SW-04	68	66	72	66	65	67	53	63
320-66139-5	SW-05	71	68	76	72	74	70	66	57
320-66139-6	SW-06	75	75	82	76	82	78	69	66
320-66139-7	SW-07	78	77	84	78	80	70	69	68
320-66139-8	SW-08	66	65	71	69	67	63	58	62
320-66139-9	SW-09	65	66	76	72	68	67	63	58
320-66139-10	SW-10	68	68	72	73	71	68	70	60
320-66139-11	SW-11	79	80	89	85	83	81	79	64
320-66139-12	SW-13	80	81	84	81	86	80	66	68
320-66139-13	SW-12	72	76	84	75	79	79	82	69
LCS 320-426954/2-A	Lab Control Sample	94	90	97	90	89	90	90	77
LCSD 320-426954/3-A	Lab Control Sample Dup	83	78	86	81	86	83	74	73
MB 320-426954/1-A	Method Blank	79	73	83	76	72	77	67	76

		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)		
320-66139-1	SW-01	95	93	94	95	105	83		
320-66139-2	SW-02	84	88	82	85	87	80		
320-66139-3	SW-03	80	84	84	89	97	71		
320-66139-4	SW-04	76	76	76	83	85	68		
320-66139-5	SW-05	80	83	84	80	86	74		
320-66139-6	SW-06	85	89	88	88	102	76		
320-66139-7	SW-07	84	90	84	90	97	79		
320-66139-8	SW-08	73	77	76	79	85	67		
320-66139-9	SW-09	76	82	79	81	84	69		
320-66139-10	SW-10	76	80	84	80	85	72		
320-66139-11	SW-11	82	91	91	94	97	81		
320-66139-12	SW-13	94	95	90	89	102	82		
320-66139-13	SW-12	84	91	93	88	96	75		
LCS 320-426954/2-A	Lab Control Sample	102	96	96	111	114	96		
LCSD 320-426954/3-A	Lab Control Sample Dup	89	87	90	102	108	85		
MB 320-426954/1-A	Method Blank	89	87	87	95	98	77		

Surrogate Legend

PFHxA = 13C2 PFHxA
C4PFHA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA
PFUnA = 13C2 PFUnA
PFDoA = 13C2 PFDoA
PFTDA = 13C2 PFTeDA
C3PFBS = 13C3 PFBS
PFHxS = 18O2 PFHxS
PFOS = 13C4 PFOS
d3NMFOS = d3-NMeFOSAA
d5NEFOS = d5-NEtFOSAA

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

HFPODA = 13C3 HFPO-DA

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-426954/1-A
Matrix: Water
Analysis Batch: 427440

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 426954

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.58	ng/L		10/30/20 11:54	11/01/20 17:46	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.25	ng/L		10/30/20 11:54	11/01/20 17:46	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.85	ng/L		10/30/20 11:54	11/01/20 17:46	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.27	ng/L		10/30/20 11:54	11/01/20 17:46	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.31	ng/L		10/30/20 11:54	11/01/20 17:46	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		10/30/20 11:54	11/01/20 17:46	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.55	ng/L		10/30/20 11:54	11/01/20 17:46	1
Perfluorotridecanoic acid (PFTriA)	ND		2.0	1.3	ng/L		10/30/20 11:54	11/01/20 17:46	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.73	ng/L		10/30/20 11:54	11/01/20 17:46	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.20	ng/L		10/30/20 11:54	11/01/20 17:46	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.57	ng/L		10/30/20 11:54	11/01/20 17:46	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	0.54	ng/L		10/30/20 11:54	11/01/20 17:46	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		5.0	1.2	ng/L		10/30/20 11:54	11/01/20 17:46	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		5.0	1.3	ng/L		10/30/20 11:54	11/01/20 17:46	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.0	0.24	ng/L		10/30/20 11:54	11/01/20 17:46	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		4.0	1.5	ng/L		10/30/20 11:54	11/01/20 17:46	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.0	0.32	ng/L		10/30/20 11:54	11/01/20 17:46	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0	0.40	ng/L		10/30/20 11:54	11/01/20 17:46	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*79*		*25 - 150*	*10/30/20 11:54*	*11/01/20 17:46*	*1*
13C4 PFHpA	*73*		*25 - 150*	*10/30/20 11:54*	*11/01/20 17:46*	*1*
13C4 PFOA	*83*		*25 - 150*	*10/30/20 11:54*	*11/01/20 17:46*	*1*
13C5 PFNA	*76*		*25 - 150*	*10/30/20 11:54*	*11/01/20 17:46*	*1*
13C2 PFDA	*72*		*25 - 150*	*10/30/20 11:54*	*11/01/20 17:46*	*1*
13C2 PFUnA	*77*		*25 - 150*	*10/30/20 11:54*	*11/01/20 17:46*	*1*
13C2 PFDoA	*67*		*25 - 150*	*10/30/20 11:54*	*11/01/20 17:46*	*1*
13C2 PFTeDA	*76*		*25 - 150*	*10/30/20 11:54*	*11/01/20 17:46*	*1*
13C3 PFBS	*89*		*25 - 150*	*10/30/20 11:54*	*11/01/20 17:46*	*1*
18O2 PFHxS	*87*		*25 - 150*	*10/30/20 11:54*	*11/01/20 17:46*	*1*
13C4 PFOS	*87*		*25 - 150*	*10/30/20 11:54*	*11/01/20 17:46*	*1*
d3-NMeFOSAA	*95*		*25 - 150*	*10/30/20 11:54*	*11/01/20 17:46*	*1*
d5-NEtFOSAA	*98*		*25 - 150*	*10/30/20 11:54*	*11/01/20 17:46*	*1*
13C3 HFPO-DA	*77*		*25 - 150*	*10/30/20 11:54*	*11/01/20 17:46*	*1*

Lab Sample ID: LCS 320-426954/2-A
Matrix: Water
Analysis Batch: 427440

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 426954

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	40.0	39.1		ng/L		98	73 - 133
Perfluoroheptanoic acid (PFHpA)	40.0	42.1		ng/L		105	72 - 132
Perfluorooctanoic acid (PFOA)	40.0	38.2		ng/L		96	70 - 130
Perfluorononanoic acid (PFNA)	40.0	44.2		ng/L		111	75 - 135

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-426954/2-A
Matrix: Water
Analysis Batch: 427440

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 426954

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorodecanoic acid (PFDA)	40.0	44.7		ng/L		112	76 - 136
Perfluoroundecanoic acid (PFUnA)	40.0	44.3		ng/L		111	68 - 128
Perfluorododecanoic acid (PFDoA)	40.0	38.6		ng/L		97	71 - 131
Perfluorotridecanoic acid (PFTriA)	40.0	34.1		ng/L		85	71 - 131
Perfluorotetradecanoic acid (PFTeA)	40.0	44.4		ng/L		111	70 - 130
Perfluorobutanesulfonic acid (PFBS)	35.4	34.9		ng/L		99	67 - 127
Perfluorohexanesulfonic acid (PFHxS)	36.4	35.5		ng/L		98	59 - 119
Perfluorooctanesulfonic acid (PFOS)	37.1	37.9		ng/L		102	70 - 130
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	37.3	40.7		ng/L		109	75 - 135
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	40.0	41.8		ng/L		104	51 - 173
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	37.7	37.1		ng/L		99	54 - 114
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	37.7	39.4		ng/L		105	79 - 139

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*94*		*25 - 150*
13C4 PFHpA	*90*		*25 - 150*
13C4 PFOA	*97*		*25 - 150*
13C5 PFNA	*90*		*25 - 150*
13C2 PFDA	*89*		*25 - 150*
13C2 PFUnA	*90*		*25 - 150*
13C2 PFDoA	*90*		*25 - 150*
13C2 PFTeDA	*77*		*25 - 150*
13C3 PFBS	*102*		*25 - 150*
18O2 PFHxS	*96*		*25 - 150*
13C4 PFOS	*96*		*25 - 150*
d3-NMeFOSAA	*111*		*25 - 150*
d5-NEtFOSAA	*114*		*25 - 150*
13C3 HFPO-DA	*96*		*25 - 150*

Lab Sample ID: LCSD 320-426954/3-A
Matrix: Water
Analysis Batch: 427440

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 426954

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	40.0	40.1		ng/L		100	73 - 133	2	30
Perfluoroheptanoic acid (PFHpA)	40.0	43.3		ng/L		108	72 - 132	3	30
Perfluorooctanoic acid (PFOA)	40.0	39.4		ng/L		99	70 - 130	3	30
Perfluorononanoic acid (PFNA)	40.0	44.6		ng/L		112	75 - 135	1	30
Perfluorodecanoic acid (PFDA)	40.0	41.2		ng/L		103	76 - 136	8	30
Perfluoroundecanoic acid (PFUnA)	40.0	42.2		ng/L		106	68 - 128	5	30

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 320-426954/3-A
Matrix: Water
Analysis Batch: 427440

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 426954

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorododecanoic acid (PFDoA)			40.0	41.5		ng/L		104	71 - 131	7	30
Perfluorotridecanoic acid (PFTriA)			40.0	38.1		ng/L		95	71 - 131	11	30
Perfluorotetradecanoic acid (PFTeA)			40.0	48.0		ng/L		120	70 - 130	8	30
Perfluorobutanesulfonic acid (PFBS)			35.4	37.1		ng/L		105	67 - 127	6	30
Perfluorohexanesulfonic acid (PFHxS)			36.4	37.9		ng/L		104	59 - 119	6	30
Perfluorooctanesulfonic acid (PFOS)			37.1	38.6		ng/L		104	70 - 130	2	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid			37.3	39.1		ng/L		105	75 - 135	4	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)			40.0	41.6		ng/L		104	51 - 173	0	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid			37.7	35.3		ng/L		94	54 - 114	5	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)			37.7	38.2		ng/L		101	79 - 139	3	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C2 PFHxA	*83*		*25 - 150*
13C4 PFHpA	*78*		*25 - 150*
13C4 PFOA	*86*		*25 - 150*
13C5 PFNA	*81*		*25 - 150*
13C2 PFDA	*86*		*25 - 150*
13C2 PFUnA	*83*		*25 - 150*
13C2 PFDoA	*74*		*25 - 150*
13C2 PFTeDA	*73*		*25 - 150*
13C3 PFBS	*89*		*25 - 150*
18O2 PFHxS	*87*		*25 - 150*
13C4 PFOS	*90*		*25 - 150*
d3-NMeFOSAA	*102*		*25 - 150*
d5-NEtFOSAA	*108*		*25 - 150*
13C3 HFPO-DA	*85*		*25 - 150*

LCMS

Prep Batch: 426954

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66139-1	SW-01	Total/NA	Water	3535	
320-66139-2	SW-02	Total/NA	Water	3535	
320-66139-3	SW-03	Total/NA	Water	3535	
320-66139-4	SW-04	Total/NA	Water	3535	
320-66139-5	SW-05	Total/NA	Water	3535	
320-66139-6	SW-06	Total/NA	Water	3535	
320-66139-7	SW-07	Total/NA	Water	3535	
320-66139-8	SW-08	Total/NA	Water	3535	
320-66139-9	SW-09	Total/NA	Water	3535	
320-66139-10	SW-10	Total/NA	Water	3535	
320-66139-11	SW-11	Total/NA	Water	3535	
320-66139-12	SW-13	Total/NA	Water	3535	
320-66139-13	SW-12	Total/NA	Water	3535	
MB 320-426954/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-426954/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-426954/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 427440

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66139-1	SW-01	Total/NA	Water	537 (modified)	426954
320-66139-2	SW-02	Total/NA	Water	537 (modified)	426954
320-66139-3	SW-03	Total/NA	Water	537 (modified)	426954
320-66139-4	SW-04	Total/NA	Water	537 (modified)	426954
320-66139-5	SW-05	Total/NA	Water	537 (modified)	426954
320-66139-6	SW-06	Total/NA	Water	537 (modified)	426954
320-66139-7	SW-07	Total/NA	Water	537 (modified)	426954
320-66139-8	SW-08	Total/NA	Water	537 (modified)	426954
320-66139-9	SW-09	Total/NA	Water	537 (modified)	426954
320-66139-10	SW-10	Total/NA	Water	537 (modified)	426954
320-66139-11	SW-11	Total/NA	Water	537 (modified)	426954
320-66139-12	SW-13	Total/NA	Water	537 (modified)	426954
320-66139-13	SW-12	Total/NA	Water	537 (modified)	426954
MB 320-426954/1-A	Method Blank	Total/NA	Water	537 (modified)	426954
LCS 320-426954/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	426954
LCSD 320-426954/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	426954

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

Client Sample ID: SW-01
Date Collected: 10/20/20 16:09
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-1
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			286.3 mL	10.00 mL	426954	10/30/20 11:54	LA	TAL SAC
Total/NA	Analysis	537 (modified)		1			427440	11/01/20 18:13	RS1	TAL SAC

Client Sample ID: SW-02
Date Collected: 10/20/20 16:40
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-2
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			257.9 mL	10.00 mL	426954	10/30/20 11:54	LA	TAL SAC
Total/NA	Analysis	537 (modified)		1			427440	11/01/20 18:23	RS1	TAL SAC

Client Sample ID: SW-03
Date Collected: 10/20/20 16:30
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-3
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			274.9 mL	10.00 mL	426954	10/30/20 11:54	LA	TAL SAC
Total/NA	Analysis	537 (modified)		1			427440	11/01/20 18:32	RS1	TAL SAC

Client Sample ID: SW-04
Date Collected: 10/20/20 17:00
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-4
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			269.5 mL	10.00 mL	426954	10/30/20 11:54	LA	TAL SAC
Total/NA	Analysis	537 (modified)		1			427440	11/01/20 18:41	RS1	TAL SAC

Client Sample ID: SW-05
Date Collected: 10/20/20 17:30
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-5
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			287.7 mL	10.00 mL	426954	10/30/20 11:54	LA	TAL SAC
Total/NA	Analysis	537 (modified)		1			427440	11/01/20 18:50	RS1	TAL SAC

Client Sample ID: SW-06
Date Collected: 10/22/20 11:45
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-6
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			271.2 mL	10.00 mL	426954	10/30/20 11:54	LA	TAL SAC
Total/NA	Analysis	537 (modified)		1			427440	11/01/20 18:59	RS1	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

Client Sample ID: SW-07
Date Collected: 10/22/20 12:02
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-7
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			260.2 mL	10.00 mL	426954	10/30/20 11:54	LA	TAL SAC
Total/NA	Analysis	537 (modified)		1			427440	11/01/20 19:08	RS1	TAL SAC

Client Sample ID: SW-08
Date Collected: 10/22/20 12:25
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-8
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			264.8 mL	10.00 mL	426954	10/30/20 11:54	LA	TAL SAC
Total/NA	Analysis	537 (modified)		1			427440	11/01/20 19:36	RS1	TAL SAC

Client Sample ID: SW-09
Date Collected: 10/22/20 12:40
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-9
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			267.3 mL	10.00 mL	426954	10/30/20 11:54	LA	TAL SAC
Total/NA	Analysis	537 (modified)		1			427440	11/01/20 19:45	RS1	TAL SAC

Client Sample ID: SW-10
Date Collected: 10/22/20 13:15
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-10
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			270.6 mL	10.00 mL	426954	10/30/20 11:54	LA	TAL SAC
Total/NA	Analysis	537 (modified)		1			427440	11/01/20 19:54	RS1	TAL SAC

Client Sample ID: SW-11
Date Collected: 10/22/20 13:05
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-11
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			265 mL	10.00 mL	426954	10/30/20 11:54	LA	TAL SAC
Total/NA	Analysis	537 (modified)		1			427440	11/01/20 20:03	RS1	TAL SAC

Client Sample ID: SW-13
Date Collected: 10/22/20 14:01
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-12
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			249.7 mL	10.00 mL	426954	10/30/20 11:54	LA	TAL SAC
Total/NA	Analysis	537 (modified)		1			427440	11/01/20 20:12	RS1	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

Client Sample ID: SW-12

Date Collected: 10/22/20 13:45
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66139-13

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			251.3 mL	10.00 mL	426954	10/30/20 11:54	LA	TAL SAC
Total/NA	Analysis	537 (modified)		1			427440	11/01/20 20:21	RS1	TAL SAC

Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

Laboratory: Eurofins TestAmerica, Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	01-20-21
ANAB	Dept. of Defense ELAP	L2468	01-20-21
ANAB	Dept. of Energy	L2468.01	01-20-21
ANAB	ISO/IEC 17025	L2468	01-20-21
Arizona	State	AZ0708	08-11-21
Arkansas DEQ	State	88-0691	06-17-21
California	State	2897	01-31-22
Colorado	State	CA0004	08-31-21
Connecticut	State	PH-0691	06-30-21
Florida	NELAP	E87570	06-30-21
Georgia	State	4040	01-30-21
Hawaii	State	<cert No.>	01-29-21
Illinois	NELAP	200060	03-17-21
Kansas	NELAP	E-10375	10-31-20 *
Louisiana	NELAP	01944	06-30-21
Maine	State	CA00004	04-14-22
Michigan	State	9947	08-03-23
Nevada	State	CA000442021-1	07-31-21
New Hampshire	NELAP	2997	04-18-21
New Jersey	NELAP	CA005	06-30-21
New York	NELAP	11666	04-01-21
Oregon	NELAP	4040	01-29-21
Pennsylvania	NELAP	68-01272	03-31-21
Texas	NELAP	T104704399-19-13	06-01-21
US Fish & Wildlife	US Federal Programs	58448	07-31-21
USDA	US Federal Programs	P330-18-00239	07-31-21
Utah	NELAP	CA000442019-01	02-28-21
Vermont	State	VT-4040	04-16-21
Virginia	NELAP	460278	03-14-21
Washington	State	C581	05-05-21
West Virginia (DW)	State	9930C	12-31-20
Wisconsin	State	998204680	08-31-21
Wyoming	State Program	8TMS-L	01-28-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
3535	Solid-Phase Extraction (SPE)	SW846	TAL 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:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66139-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
320-66139-1	SW-01	Water	10/20/20 16:09	10/29/20 10:55	
320-66139-2	SW-02	Water	10/20/20 16:40	10/29/20 10:55	
320-66139-3	SW-03	Water	10/20/20 16:30	10/29/20 10:55	
320-66139-4	SW-04	Water	10/20/20 17:00	10/29/20 10:55	
320-66139-5	SW-05	Water	10/20/20 17:30	10/29/20 10:55	
320-66139-6	SW-06	Water	10/22/20 11:45	10/29/20 10:55	
320-66139-7	SW-07	Water	10/22/20 12:02	10/29/20 10:55	
320-66139-8	SW-08	Water	10/22/20 12:25	10/29/20 10:55	
320-66139-9	SW-09	Water	10/22/20 12:40	10/29/20 10:55	
320-66139-10	SW-10	Water	10/22/20 13:15	10/29/20 10:55	
320-66139-11	SW-11	Water	10/22/20 13:05	10/29/20 10:55	
320-66139-12	SW-13	Water	10/22/20 14:01	10/29/20 10:55	
320-66139-13	SW-12	Water	10/22/20 13:45	10/29/20 10:55	

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

2355 Hill Road
Fairbanks, AK 99709
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www.shannonwilson.com

CHAIN-OF-CUSTODY RECORD

Page 1 of 2

Laboratory Test America
Attn: David Acctucker

Turn Around Time: [X] Normal [ ] Rush — Please Specify

Quote No:

J-Flags: [X] Yes [ ] No

Analytical Methods (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	PFASx18 (537.1-M)	Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
SW-01		1609	10/20/20	X	2	Surface water
SW-02		1640		X	2	
SW-03		1630		X	2	
SW-04		1700		X	2	
SW-05		1730		X	2	
SW-06		1145	10/22/20	X	2	
SW-07		1202		X	2	
SW-08		1225		X	2	
SW-09		1240		X	2	
SW-10		1315		X	2	

320-66139 Chain of Custody

Project Information	
Number:	105745-002
Name:	OME
Contact:	MDN
Ongoing Project?	Yes [X] No [ ]
Sampler:	APW, UTY, MDN

Sample Receipt	
Total No. of Containers:	26
COC Seals/Intact? Y/N/NA	
Received Good Cond./Cold	
Temp:	
Delivery Method:	Goldstreak

Notes:

Reliquished By: 1.	Reliquished By: 2.	Reliquished By: 3.
Signature: BG Time: 1630	Signature: Time:	Signature: Time:
Printed Name: Veselina Yakimova Date: 10/26/20	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 1055	Signature: Time:	Signature: Time:
Printed Name: Jennifer Darlington Date: 29 Oct 20	Printed Name: Date:	Printed Name: Date:
Company: ETAW SRC	Company:	Company:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

Time 1224

2.6°C

No. 35946

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600
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CHAIN-OF-CUSTODY RECORD

Laboratory Test America
Attn: David Aeckucker

Turn Around Time:	Quote No:
☒ Normal ☐ Rush	J-Flags: ☒ Yes ☐ No
Please Specify	

Analytical Methods (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	PFASx18 (537.1-M)	Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
SW-11		1305	10/22/20	X	2	Surface water
SW-~~12~~ 13		1401	↓	X	2	↓
SW-12		1345	↓	X	2	

Project Information	
Number:	105745-002
Name:	OME
Contact:	MDN
Ongoing Project?	Yes ☒ No ☐
Sampler:	APW, VTY, MDN

Sample Receipt	
Total No. of Containers:	26
COC Seals/Intact? Y/N/NA	
Received Good Cond./Cold	
Temp:	
Delivery Method:	~~Goldstreak~~

Reliquished By: 1.	Reliquished By: 2.	Reliquished By: 3.
Signature: BY. Time: 1630	Signature: Time:	Signature: Time:
Printed Name: Veselina Yakimova Date: 10/22/20	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 0853	Signature: Time:	Signature: Time:
Printed Name: Jennifer Darlington Date: 29 Oct 20	Printed Name: Date:	Printed Name: Date:
Company: ETAW Sac	Company:	Company:

Notes:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

2.6°C

No. 35944

Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 320-66139-1

Login Number: 66139
List Number: 1
Creator: Oropeza, Salvador

List Source: Eurofins TestAmerica, Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	Seals
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	ONLY GEL PACKS
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.	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 <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Laboratory Data Review Checklist

Completed By:

Veselina Yakimova

Title:

Geologist

Date:

November 9, 2020

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

Eurofins / TestAmerica Laboratories, Inc.

Laboratory Report Number:

320-66139-1

Laboratory Report Date:

November 4, 2020

CS Site Name:

Nome Airport Statewide PFAS

ADEC File Number:

400.38.056

Hazard Identification Number:

27154

320-66139-1

Laboratory Report Date:

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☒ No☐ N/A☐ Comments:

   The DEC certified TestAmerica of West Sacramento, CA for the analysis of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) on February 6, 2018 by method 537. These compounds were included in the DEC's Contaminated Sites Laboratory Approval 17-020.

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☐ No☐ N/A☒ Comments:

   The requested analyses were conducted by the TestAmerica laboratory in West Sacramento, CA.

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:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☐ No☐ N/A☒ Comments:

   Samples do not require preservation other than temperature.

   c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

   Yes☒ No☐ N/A☐ Comments:

   The sample receipt form notes that the samples arrived in good condition.

Laboratory Report Date:

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 case narrative notes that the container label for the sample *SW-08* did not match the information listed on the chain-of-custody (COC). The container label time was listed 12:24 for on one of the two jars while the COC is listed 12:25. The laboratory logged in the sample according to the COC.

e. Data quality or usability affected?

Comments:

The data quality and/or usability was not affected. The labeling discrepancy did not impact method holding times.

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 samples *SW-06* and *SW-09* contained floating particulates in the bottles prior to extraction.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-426954.

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

No corrective actions were documented in the case narrative.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

The case narrative does not specify an effect on data quality/usability.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes☒ No☐ N/A☐ Comments:

Laboratory Report Date:

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:

Soil samples were not submitted with this work order.

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☒ No☐ N/A☐ Comments:

The reporting limit (RL) is less than the applicable DEC regulatory limit for the project.

e. Data quality or usability affected?

The data quality and/or usability was not affected; see above.

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 limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

PFAS were not detected in the method blank sample associated with this work order.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

The method blank did not contain detectable concentrations of PFAS.

v. Data quality or usability affected?

Comments:

The data quality/usability is not affected; see above.

Laboratory Report Date:

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

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:

Metals and/or inorganics were not analyzed as part of this work order.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

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. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

None; analytical 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 of the data was not required; see above.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and/or usability was not affected; see above.

Laboratory Report Date:

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

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 MS/MSD with the associated preparatory batch. However, the laboratory analyzed an LCS and LCSD to assess laboratory accuracy and precision.

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

Metals and/or inorganics were not analyzed as part of 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:

MS and MSD samples were not analyzed for this work order.

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:

MS and MSD samples were not analyzed for this work order.

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

N/A; MS and MSD samples were not analyzed for this work order.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

MS and MSD samples were not analyzed for this work order.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and/or usability was not 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:

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:

There were no IDA recovery failures associated with this work order.

iv. Data quality or usability affected?

Comments:

The data quality and/or usability was 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. A trip blank is not required for the requested analysis.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes☐ No☐ N/A☒ Comments:

A trip blank is not required for the requested analysis.

iii. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

A trip blank is not required for the requested analysis.

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

NA; a trip blank is not required for the requested analysis.

v. Data quality or usability affected?

Comments:

The data quality and/or usability was not affected; see above.

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☒ No☐ N/A☐ Comments:

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

The field duplicate pairs *SW-02 / SW-03,* and *SW-10 / SW-11* were submitted with this work order.

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

RPD (%) = 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:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

The data quality and/or usability was not affected; see above.

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☐ N/A☒ Comments:

Reusable equipment was not utilized during the sample collection process for the field samples included in this work order.

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

See above.

Laboratory Report Date:

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

No samples are affected. See above.

iii. Data quality or usability affected?

Comments:

The data quality/usability is not affected; see above.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes☐ No☐ N/A☒ Comments:

No other data flags/qualifiers are required.

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ANALYTICAL REPORT

Eurofins TestAmerica, Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

Laboratory Job ID: 320-66140-1
Client Project/Site: OME

For:
Shannon & Wilson, Inc
2355 Hill Rd.
Fairbanks, Alaska 99709-5244

Attn: Marcy Nadel

Authorized for release by:
11/23/2020 1:12:40 PM

David Alltucker, Project Manager I
(916)374-4383
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Table of Contents

Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66140-1

Qualifiers

LCMS

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
*5	Isotope dilution analyte is outside acceptance limits.
B	Compound was found in the blank and sample.
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits
G	The reported quantitation limit has been raised due to an exhibited elevated noise or matrix interference
H	Sample was prepped or analyzed beyond the specified holding time
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.
¤	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

Job ID: 320-66140-1

Laboratory: Eurofins TestAmerica, Sacramento

Narrative

Job Narrative
320-66140-1

Receipt
The samples were received on 10/29/2020 10:55 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.6º C.

LCMS
Method 537 (modified): Perfluorooctanesulfonic acid (PFOS) was detected above the reporting limit (RL) in the method blank associated with preparation batch 320-427297 and analytical batch 320-431076 as well as in the following samples: SD-01 (320-66140-1), SD-02 (320-66140-2), SD-03 (320-66140-3), SD-04 (320-66140-4), SD-06 (320-66140-5), SD-08 (320-66140-6), SD-09 (320-66140-7), SD-10 (320-66140-8), SD-11 (320-66140-9), SD-12 (320-66140-10), SD-13 (320-66140-11) and (MB 320-427297/1-A). All affected samples were re-extracted outside of holding time. Both sets of data have been reported.

Method 537 (modified): The laboratory control sample (LCS) for preparation batch 320-427297 and analytical batch 320-431076 recovered outside control limits for the following analytes: Perfluorooctanesulfonic acid (PFOS) and DONA. The associated sample(s) was re-prepared and/or re-analyzed outside holding time. Both sets of data have been reported.

Method 537 (modified): The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit for d3-NMeFOSAA and d5-NEtFOSAA: (LCS 320-427297/2-A) and (MB 320-427297/1-A). The samples were re-extracted outside of the holding time with IDA recoveries within control limits. Both sets of data are reported. 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): The “I” qualifier means the transition mass ratio for the indicated analyte was outside of the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty. However, analyst judgement was used to positively identify the analyte. SD-01 (320-66140-1)

Method 537 (modified): The matrix spike / matrix spike duplicate (MS/MSD) recoveries and precision for Perfluorooctanesulfonic acid (PFOS) in preparation batch 320-427297 and analytical batch 320-431076 were outside control limits. Sample matrix interference are suspected.

Method 537 (modified): The following sample exhibited matrix interferences for Perfluorohexanesulfonic acid (PFHxS) causing elevation of the reporting limit. The reporting limit has been raised to be equal to the matrix, and a "G" qualifier applied: SD-13 (320-66140-11)

Method 537 (modified): The matrix spike duplicate (MSD) recoveries of Perfluoroundecanoic acid (PFUnA) for preparation batch 320-427297 and analytical batch 320-431076 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method 537 (modified): Isotope Dilution Analyte (IDA) recovery of d5-NetFOSAA is above the method recommended limit for the following sample: SD-08 (320-66140-6). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

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 SHAKE: The following samples were light yellow after extraction: SD-01 (320-66140-1), SD-02 (320-66140-2), SD-03 (320-66140-3), SD-04 (320-66140-4), SD-08 (320-66140-6), SD-09 (320-66140-7), SD-10 (320-66140-8) and SD-11 (320-66140-9). preparation batch 320-427297

Method SHAKE: The following samples were light yellow and cloudy after extraction: SD-06 (320-66140-5), SD-13 (320-66140-11),

Job ID: 320-66140-1 (Continued)

Laboratory: Eurofins TestAmerica, Sacramento (Continued)

(320-66140-A-11 MS) and (320-66140-A-11 MSD).
preparation batch 320-427297

Method SHAKE: The following sample was yellow after extraction: SD-12 (320-66140-10).
preparation batch 320-427297

Method SHAKE: The following samples were light yellow after extraction: SD-02 (320-66140-2), SD-03 (320-66140-3), SD-12 (320-66140-10) and SD-13 (320-66140-11).
preparation batch 320-431353

Method SHAKE: The following sample was light yellow and cloudy after extraction: SD-06 (320-66140-5).
preparation batch 320-431353

Method SHAKE: The following samples were re-prepared outside of preparation holding time due to MB and LCS hit for PFOS: SD-01 (320-66140-1), SD-02 (320-66140-2), SD-03 (320-66140-3), SD-04 (320-66140-4), SD-06 (320-66140-5), SD-08 (320-66140-6), SD-09 (320-66140-7), SD-10 (320-66140-8), SD-11 (320-66140-9), SD-12 (320-66140-10), SD-13 (320-66140-11), (320-66140-A-1 MS) and (320-66140-A-1 MSD).
preparation batch 320-431353

Method SHAKE: The following samples were re-prepared outside of preparation holding time because the LCS recovery for PFOS was out: SD-06 (320-66140-5), SD-08 (320-66140-6), SD-09 (320-66140-7), SD-10 (320-66140-8), SD-11 (320-66140-9), SD-13 (320-66140-11), (320-66140-A-11 MS) and (320-66140-A-11 MSD).
preparation batch 320-433672

Method SHAKE: Extracts are yellowish in color. SD-06 (320-66140-5), SD-08 (320-66140-6), SD-09 (320-66140-7), SD-10 (320-66140-8), SD-11 (320-66140-9), SD-13 (320-66140-11), (320-66140-A-11 MS) and (320-66140-A-11 MSD)
preparation batch 320-433672

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: OME

Job ID: 320-66140-1

Client Sample ID: SD-01 — Lab Sample ID: 320-66140-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.061	J I	0.22	0.034	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	2.6	B *	0.55	0.22	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	0.39	J H B *	0.57	0.23	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SD-02 — Lab Sample ID: 320-66140-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	0.83	B *	0.82	0.33	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	0.60	J H B *	0.83	0.33	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SD-03 — Lab Sample ID: 320-66140-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	0.79	B *	0.61	0.24	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	0.49	J H B *	0.59	0.24	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SD-04 — Lab Sample ID: 320-66140-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	1.5	B *	0.69	0.28	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	0.28	J H B *	0.65	0.26	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SD-06 — Lab Sample ID: 320-66140-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.058	J	0.22	0.046	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.19	J	0.22	0.034	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	2.3	B *	0.55	0.22	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	0.78	H B	0.55	0.22	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SD-08 — Lab Sample ID: 320-66140-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.14	J	0.45	0.094	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.089	J	0.45	0.065	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.10	J	0.45	0.080	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.13	J	0.45	0.049	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.16	J	0.45	0.080	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.15	J	0.45	0.069	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	3.6	B *	1.1	0.45	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	1.5	H B	1.1	0.46	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SD-09 — Lab Sample ID: 320-66140-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	0.37	J B *	0.65	0.26	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	0.50	J H B	0.67	0.27	ug/Kg	1	☼	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66140-1

Client Sample ID: SD-10 — Lab Sample ID: 320-66140-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorononanoic acid (PFNA)	0.076	J	0.30	0.054	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.11	J	0.30	0.047	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.6	B *	0.75	0.30	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	1.1	H B	0.77	0.31	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SD-11 — Lab Sample ID: 320-66140-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorononanoic acid (PFNA)	0.057	J	0.26	0.047	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.10	J	0.26	0.041	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.8	B *	0.66	0.26	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	0.75	H B	0.65	0.26	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SD-12 — Lab Sample ID: 320-66140-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	0.82	J B *	0.86	0.35	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	0.51	J H B *	0.82	0.33	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SD-13 — Lab Sample ID: 320-66140-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.24		0.23	0.049	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.079	J	0.23	0.034	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.15	J	0.23	0.10	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.14	J	0.23	0.042	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.63		0.23	0.026	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.26	F1	0.23	0.042	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorododecanoic acid (PFDoA)	0.32		0.23	0.078	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.036	J	0.23	0.029	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	3.2	F2 B F1 *	0.58	0.23	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RE	2.8	H B	0.62	0.25	ug/Kg	1	☼	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: SD-01
Date Collected: 10/20/20 16:10
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-1
Matrix: Solid
Percent Solids: 85.9

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.22	0.046	ug/Kg	☼	10/31/20 07:23	11/12/20 22:11	1
Perfluoroheptanoic acid (PFHpA)	ND		0.22	0.032	ug/Kg	☼	10/31/20 07:23	11/12/20 22:11	1
Perfluorooctanoic acid (PFOA)	ND		0.22	0.094	ug/Kg	☼	10/31/20 07:23	11/12/20 22:11	1
Perfluorononanoic acid (PFNA)	ND		0.22	0.040	ug/Kg	☼	10/31/20 07:23	11/12/20 22:11	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.024	ug/Kg	☼	10/31/20 07:23	11/12/20 22:11	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.040	ug/Kg	☼	10/31/20 07:23	11/12/20 22:11	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.074	ug/Kg	☼	10/31/20 07:23	11/12/20 22:11	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.056	ug/Kg	☼	10/31/20 07:23	11/12/20 22:11	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.059	ug/Kg	☼	10/31/20 07:23	11/12/20 22:11	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.027	ug/Kg	☼	10/31/20 07:23	11/12/20 22:11	1
Perfluorohexanesulfonic acid (PFHxS)	**0.061**	**J I**	0.22	0.034	ug/Kg	☼	10/31/20 07:23	11/12/20 22:11	1
Perfluorooctanesulfonic acid (PFOS)	**2.6**	**B ***	0.55	0.22	ug/Kg	☼	10/31/20 07:23	11/12/20 22:11	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.43	ug/Kg	☼	10/31/20 07:23	11/12/20 22:11	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.41	ug/Kg	☼	10/31/20 07:23	11/12/20 22:11	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.22	0.030	ug/Kg	☼	10/31/20 07:23	11/12/20 22:11	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.27	0.12	ug/Kg	☼	10/31/20 07:23	11/12/20 22:11	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.22	0.024	ug/Kg	☼	10/31/20 07:23	11/12/20 22:11	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	*	0.22	0.020	ug/Kg	☼	10/31/20 07:23	11/12/20 22:11	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*105*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:11*	*1*
13C4 PFHpA	*103*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:11*	*1*
13C4 PFOA	*100*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:11*	*1*
13C5 PFNA	*97*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:11*	*1*
13C2 PFDA	*98*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:11*	*1*
13C2 PFUnA	*92*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:11*	*1*
13C2 PFDoA	*97*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:11*	*1*
13C2 PFTeDA	*90*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:11*	*1*
13C3 PFBS	*94*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:11*	*1*
18O2 PFHxS	*98*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:11*	*1*
13C4 PFOS	*90*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:11*	*1*
d3-NMeFOSAA	*71*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:11*	*1*
d5-NEtFOSAA	*68*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:11*	*1*
13C3 HFPO-DA	*99*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:11*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**0.39**	**J H B ***	0.57	0.23	ug/Kg	☼	11/13/20 08:15	11/17/20 22:34	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND	H	2.3	0.44	ug/Kg	☼	11/13/20 08:15	11/17/20 22:34	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND	H	2.3	0.42	ug/Kg	☼	11/13/20 08:15	11/17/20 22:34	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	H	0.23	0.020	ug/Kg	☼	11/13/20 08:15	11/17/20 22:34	1

Client Sample ID: SD-01
Date Collected: 10/20/20 16:10
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-1
Matrix: Solid
Percent Solids: 85.9

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	87		25 - 150	11/13/20 08:15	11/17/20 22:34	1
d3-NMeFOSAA	95		25 - 150	11/13/20 08:15	11/17/20 22:34	1
d5-NEtFOSAA	101		25 - 150	11/13/20 08:15	11/17/20 22:34	1

Client Sample ID: SD-02
Date Collected: 10/20/20 16:41
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-2
Matrix: Solid
Percent Solids: 56.3

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.33	0.069	ug/Kg	☼	10/31/20 07:23	11/12/20 22:21	1
Perfluoroheptanoic acid (PFHpA)	ND		0.33	0.048	ug/Kg	☼	10/31/20 07:23	11/12/20 22:21	1
Perfluorooctanoic acid (PFOA)	ND		0.33	0.14	ug/Kg	☼	10/31/20 07:23	11/12/20 22:21	1
Perfluorononanoic acid (PFNA)	ND		0.33	0.059	ug/Kg	☼	10/31/20 07:23	11/12/20 22:21	1
Perfluorodecanoic acid (PFDA)	ND		0.33	0.036	ug/Kg	☼	10/31/20 07:23	11/12/20 22:21	1
Perfluoroundecanoic acid (PFUnA)	ND		0.33	0.059	ug/Kg	☼	10/31/20 07:23	11/12/20 22:21	1
Perfluorododecanoic acid (PFDoA)	ND		0.33	0.11	ug/Kg	☼	10/31/20 07:23	11/12/20 22:21	1
Perfluorotridecanoic acid (PFTriA)	ND		0.33	0.084	ug/Kg	☼	10/31/20 07:23	11/12/20 22:21	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.33	0.089	ug/Kg	☼	10/31/20 07:23	11/12/20 22:21	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.33	0.041	ug/Kg	☼	10/31/20 07:23	11/12/20 22:21	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.33	0.051	ug/Kg	☼	10/31/20 07:23	11/12/20 22:21	1
Perfluorooctanesulfonic acid (PFOS)	**0.83**	**B ***	0.82	0.33	ug/Kg	☼	10/31/20 07:23	11/12/20 22:21	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		3.3	0.64	ug/Kg	☼	10/31/20 07:23	11/12/20 22:21	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		3.3	0.61	ug/Kg	☼	10/31/20 07:23	11/12/20 22:21	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.33	0.045	ug/Kg	☼	10/31/20 07:23	11/12/20 22:21	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.41	0.18	ug/Kg	☼	10/31/20 07:23	11/12/20 22:21	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.33	0.036	ug/Kg	☼	10/31/20 07:23	11/12/20 22:21	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	*	0.33	0.030	ug/Kg	☼	10/31/20 07:23	11/12/20 22:21	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*85*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:21*	*1*
13C4 PFHpA	*95*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:21*	*1*
13C4 PFOA	*96*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:21*	*1*
13C5 PFNA	*95*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:21*	*1*
13C2 PFDA	*92*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:21*	*1*
13C2 PFUnA	*91*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:21*	*1*
13C2 PFDoA	*80*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:21*	*1*
13C2 PFTeDA	*70*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:21*	*1*
13C3 PFBS	*87*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:21*	*1*
18O2 PFHxS	*93*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:21*	*1*
13C4 PFOS	*94*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:21*	*1*
d3-NMeFOSAA	*81*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:21*	*1*
d5-NEtFOSAA	*80*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:21*	*1*
13C3 HFPO-DA	*81*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:21*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**0.60**	**J H B ***	0.83	0.33	ug/Kg	☼	11/13/20 08:15	11/17/20 23:02	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND	H	3.3	0.65	ug/Kg	☼	11/13/20 08:15	11/17/20 23:02	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND	H	3.3	0.62	ug/Kg	☼	11/13/20 08:15	11/17/20 23:02	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	H	0.33	0.030	ug/Kg	☼	11/13/20 08:15	11/17/20 23:02	1

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66140-1

Client Sample ID: SD-02
Date Collected: 10/20/20 16:41
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-2
Matrix: Solid
Percent Solids: 56.3

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	101		25 - 150	11/13/20 08:15	11/17/20 23:02	1
d3-NMeFOSAA	107		25 - 150	11/13/20 08:15	11/17/20 23:02	1
d5-NEtFOSAA	113		25 - 150	11/13/20 08:15	11/17/20 23:02	1

Client Sample ID: SD-03
Date Collected: 10/20/20 16:31
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-3
Matrix: Solid
Percent Solids: 77.0

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.24	0.051	ug/Kg	☼	10/31/20 07:23	11/12/20 22:30	1
Perfluoroheptanoic acid (PFHpA)	ND		0.24	0.035	ug/Kg	☼	10/31/20 07:23	11/12/20 22:30	1
Perfluorooctanoic acid (PFOA)	ND		0.24	0.10	ug/Kg	☼	10/31/20 07:23	11/12/20 22:30	1
Perfluorononanoic acid (PFNA)	ND		0.24	0.044	ug/Kg	☼	10/31/20 07:23	11/12/20 22:30	1
Perfluorodecanoic acid (PFDA)	ND		0.24	0.027	ug/Kg	☼	10/31/20 07:23	11/12/20 22:30	1
Perfluoroundecanoic acid (PFUnA)	ND		0.24	0.044	ug/Kg	☼	10/31/20 07:23	11/12/20 22:30	1
Perfluorododecanoic acid (PFDoA)	ND		0.24	0.081	ug/Kg	☼	10/31/20 07:23	11/12/20 22:30	1
Perfluorotridecanoic acid (PFTriA)	ND		0.24	0.062	ug/Kg	☼	10/31/20 07:23	11/12/20 22:30	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.24	0.066	ug/Kg	☼	10/31/20 07:23	11/12/20 22:30	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.24	0.030	ug/Kg	☼	10/31/20 07:23	11/12/20 22:30	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.24	0.038	ug/Kg	☼	10/31/20 07:23	11/12/20 22:30	1
Perfluorooctanesulfonic acid (PFOS)	**0.79**	**B ***	0.61	0.24	ug/Kg	☼	10/31/20 07:23	11/12/20 22:30	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.4	0.47	ug/Kg	☼	10/31/20 07:23	11/12/20 22:30	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.4	0.45	ug/Kg	☼	10/31/20 07:23	11/12/20 22:30	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.24	0.033	ug/Kg	☼	10/31/20 07:23	11/12/20 22:30	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.30	0.13	ug/Kg	☼	10/31/20 07:23	11/12/20 22:30	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.24	0.027	ug/Kg	☼	10/31/20 07:23	11/12/20 22:30	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	*	0.24	0.022	ug/Kg	☼	10/31/20 07:23	11/12/20 22:30	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*85*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:30*	*1*
13C4 PFHpA	*93*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:30*	*1*
13C4 PFOA	*97*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:30*	*1*
13C5 PFNA	*90*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:30*	*1*
13C2 PFDA	*91*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:30*	*1*
13C2 PFUnA	*93*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:30*	*1*
13C2 PFDoA	*86*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:30*	*1*
13C2 PFTeDA	*66*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:30*	*1*
13C3 PFBS	*89*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:30*	*1*
18O2 PFHxS	*92*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:30*	*1*
13C4 PFOS	*96*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:30*	*1*
d3-NMeFOSAA	*88*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:30*	*1*
d5-NEtFOSAA	*88*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:30*	*1*
13C3 HFPO-DA	*83*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:30*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**0.49**	**J H B ***	0.59	0.24	ug/Kg	☼	11/13/20 08:15	11/17/20 23:11	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND	H	2.4	0.46	ug/Kg	☼	11/13/20 08:15	11/17/20 23:11	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND	H	2.4	0.44	ug/Kg	☼	11/13/20 08:15	11/17/20 23:11	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	H	0.24	0.021	ug/Kg	☼	11/13/20 08:15	11/17/20 23:11	1

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66140-1

Client Sample ID: SD-03
Date Collected: 10/20/20 16:31
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-3
Matrix: Solid
Percent Solids: 77.0

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	92		25 - 150	11/13/20 08:15	11/17/20 23:11	1
d3-NMeFOSAA	106		25 - 150	11/13/20 08:15	11/17/20 23:11	1
d5-NEtFOSAA	93		25 - 150	11/13/20 08:15	11/17/20 23:11	1

Client Sample ID: SD-04
Date Collected: 10/20/20 17:01
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-4
Matrix: Solid
Percent Solids: 71.8

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.28	0.058	ug/Kg	☼	10/31/20 07:23	11/12/20 22:40	1
Perfluoroheptanoic acid (PFHpA)	ND		0.28	0.040	ug/Kg	☼	10/31/20 07:23	11/12/20 22:40	1
Perfluorooctanoic acid (PFOA)	ND		0.28	0.12	ug/Kg	☼	10/31/20 07:23	11/12/20 22:40	1
Perfluorononanoic acid (PFNA)	ND		0.28	0.050	ug/Kg	☼	10/31/20 07:23	11/12/20 22:40	1
Perfluorodecanoic acid (PFDA)	ND		0.28	0.030	ug/Kg	☼	10/31/20 07:23	11/12/20 22:40	1
Perfluoroundecanoic acid (PFUnA)	ND		0.28	0.050	ug/Kg	☼	10/31/20 07:23	11/12/20 22:40	1
Perfluorododecanoic acid (PFDoA)	ND		0.28	0.093	ug/Kg	☼	10/31/20 07:23	11/12/20 22:40	1
Perfluorotridecanoic acid (PFTriA)	ND		0.28	0.070	ug/Kg	☼	10/31/20 07:23	11/12/20 22:40	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.28	0.075	ug/Kg	☼	10/31/20 07:23	11/12/20 22:40	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.28	0.035	ug/Kg	☼	10/31/20 07:23	11/12/20 22:40	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.28	0.043	ug/Kg	☼	10/31/20 07:23	11/12/20 22:40	1
Perfluorooctanesulfonic acid (PFOS)	**1.5**	**B ***	0.69	0.28	ug/Kg	☼	10/31/20 07:23	11/12/20 22:40	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.8	0.54	ug/Kg	☼	10/31/20 07:23	11/12/20 22:40	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.8	0.51	ug/Kg	☼	10/31/20 07:23	11/12/20 22:40	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.28	0.037	ug/Kg	☼	10/31/20 07:23	11/12/20 22:40	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.35	0.15	ug/Kg	☼	10/31/20 07:23	11/12/20 22:40	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.28	0.030	ug/Kg	☼	10/31/20 07:23	11/12/20 22:40	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	*	0.28	0.025	ug/Kg	☼	10/31/20 07:23	11/12/20 22:40	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*100*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:40*	*1*
13C4 PFHpA	*102*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:40*	*1*
13C4 PFOA	*101*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:40*	*1*
13C5 PFNA	*99*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:40*	*1*
13C2 PFDA	*96*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:40*	*1*
13C2 PFUnA	*104*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:40*	*1*
13C2 PFDoA	*94*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:40*	*1*
13C2 PFTeDA	*83*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:40*	*1*
13C3 PFBS	*94*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:40*	*1*
18O2 PFHxS	*100*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:40*	*1*
13C4 PFOS	*97*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:40*	*1*
d3-NMeFOSAA	*79*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:40*	*1*
d5-NEtFOSAA	*86*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:40*	*1*
13C3 HFPO-DA	*94*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:40*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**0.28**	**J H B ***	0.65	0.26	ug/Kg	☼	11/13/20 08:15	11/17/20 23:21	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND	H	2.6	0.51	ug/Kg	☼	11/13/20 08:15	11/17/20 23:21	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND	H	2.6	0.48	ug/Kg	☼	11/13/20 08:15	11/17/20 23:21	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	H	0.26	0.024	ug/Kg	☼	11/13/20 08:15	11/17/20 23:21	1

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66140-1

Client Sample ID: SD-04
Date Collected: 10/20/20 17:01
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-4
Matrix: Solid
Percent Solids: 71.8

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	89		25 - 150	11/13/20 08:15	11/17/20 23:21	1
d3-NMeFOSAA	85		25 - 150	11/13/20 08:15	11/17/20 23:21	1
d5-NEtFOSAA	89		25 - 150	11/13/20 08:15	11/17/20 23:21	1

Client Sample ID: SD-06

Date Collected: 10/22/20 11:46
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-5

Matrix: Solid
Percent Solids: 84.6

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	0.046	ug/Kg	☼	10/31/20 07:23	11/12/20 22:49	1
Perfluoroheptanoic acid (PFHpA)	ND		0.22	0.032	ug/Kg	☼	10/31/20 07:23	11/12/20 22:49	1
Perfluorooctanoic acid (PFOA)	ND		0.22	0.095	ug/Kg	☼	10/31/20 07:23	11/12/20 22:49	1
Perfluorononanoic acid (PFNA)	ND		0.22	0.040	ug/Kg	☼	10/31/20 07:23	11/12/20 22:49	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.024	ug/Kg	☼	10/31/20 07:23	11/12/20 22:49	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.040	ug/Kg	☼	10/31/20 07:23	11/12/20 22:49	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.074	ug/Kg	☼	10/31/20 07:23	11/12/20 22:49	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.056	ug/Kg	☼	10/31/20 07:23	11/12/20 22:49	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.059	ug/Kg	☼	10/31/20 07:23	11/12/20 22:49	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.027	ug/Kg	☼	10/31/20 07:23	11/12/20 22:49	1
Perfluorohexanesulfonic acid (PFHxS)	**0.19**	**J**	0.22	0.034	ug/Kg	☼	10/31/20 07:23	11/12/20 22:49	1
Perfluorooctanesulfonic acid (PFOS)	**2.3**	**B ***	0.55	0.22	ug/Kg	☼	10/31/20 07:23	11/12/20 22:49	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.43	ug/Kg	☼	10/31/20 07:23	11/12/20 22:49	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.41	ug/Kg	☼	10/31/20 07:23	11/12/20 22:49	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.22	0.030	ug/Kg	☼	10/31/20 07:23	11/12/20 22:49	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.27	0.12	ug/Kg	☼	10/31/20 07:23	11/12/20 22:49	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.22	0.024	ug/Kg	☼	10/31/20 07:23	11/12/20 22:49	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	*	0.22	0.020	ug/Kg	☼	10/31/20 07:23	11/12/20 22:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*103*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:49*	*1*
13C4 PFHpA	*105*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:49*	*1*
13C4 PFOA	*104*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:49*	*1*
13C5 PFNA	*96*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:49*	*1*
13C2 PFDA	*91*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:49*	*1*
13C2 PFUnA	*97*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:49*	*1*
13C2 PFDoA	*85*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:49*	*1*
13C2 PFTeDA	*80*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:49*	*1*
13C3 PFBS	*101*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:49*	*1*
18O2 PFHxS	*101*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:49*	*1*
13C4 PFOS	*104*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:49*	*1*
d3-NMeFOSAA	*69*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:49*	*1*
d5-NEtFOSAA	*73*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:49*	*1*
13C3 HFPO-DA	*100*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:49*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**0.78**	**H B**	0.55	0.22	ug/Kg	☼	11/19/20 15:36	11/21/20 22:35	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND	H	2.2	0.43	ug/Kg	☼	11/19/20 15:36	11/21/20 22:35	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND	H	2.2	0.41	ug/Kg	☼	11/19/20 15:36	11/21/20 22:35	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	H	0.22	0.020	ug/Kg	☼	11/19/20 15:36	11/21/20 22:35	1

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66140-1

Client Sample ID: SD-06
Date Collected: 10/22/20 11:46
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-5
Matrix: Solid
Percent Solids: 84.6

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	96		25 - 150	11/19/20 15:36	11/21/20 22:35	1
d3-NMeFOSAA	112		25 - 150	11/19/20 15:36	11/21/20 22:35	1
d5-NEtFOSAA	121		25 - 150	11/19/20 15:36	11/21/20 22:35	1

Client Sample ID: SD-08
Date Collected: 10/22/20 12:26
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-6
Matrix: Solid
Percent Solids: 43.9

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.14**	**J**	0.45	0.094	ug/Kg	☼	10/31/20 07:23	11/12/20 22:58	1
Perfluoroheptanoic acid (PFHpA)	**0.089**	**J**	0.45	0.065	ug/Kg	☼	10/31/20 07:23	11/12/20 22:58	1
Perfluorooctanoic acid (PFOA)	ND		0.45	0.19	ug/Kg	☼	10/31/20 07:23	11/12/20 22:58	1
Perfluorononanoic acid (PFNA)	**0.10**	**J**	0.45	0.080	ug/Kg	☼	10/31/20 07:23	11/12/20 22:58	1
Perfluorodecanoic acid (PFDA)	**0.13**	**J**	0.45	0.049	ug/Kg	☼	10/31/20 07:23	11/12/20 22:58	1
Perfluoroundecanoic acid (PFUnA)	**0.16**	**J**	0.45	0.080	ug/Kg	☼	10/31/20 07:23	11/12/20 22:58	1
Perfluorododecanoic acid (PFDoA)	ND		0.45	0.15	ug/Kg	☼	10/31/20 07:23	11/12/20 22:58	1
Perfluorotridecanoic acid (PFTriA)	ND		0.45	0.11	ug/Kg	☼	10/31/20 07:23	11/12/20 22:58	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.45	0.12	ug/Kg	☼	10/31/20 07:23	11/12/20 22:58	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.45	0.056	ug/Kg	☼	10/31/20 07:23	11/12/20 22:58	1
Perfluorohexanesulfonic acid (PFHxS)	**0.15**	**J**	0.45	0.069	ug/Kg	☼	10/31/20 07:23	11/12/20 22:58	1
Perfluorooctanesulfonic acid (PFOS)	**3.6**	**B ***	1.1	0.45	ug/Kg	☼	10/31/20 07:23	11/12/20 22:58	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.5	0.87	ug/Kg	☼	10/31/20 07:23	11/12/20 22:58	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.5	0.82	ug/Kg	☼	10/31/20 07:23	11/12/20 22:58	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.45	0.060	ug/Kg	☼	10/31/20 07:23	11/12/20 22:58	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.56	0.24	ug/Kg	☼	10/31/20 07:23	11/12/20 22:58	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.45	0.049	ug/Kg	☼	10/31/20 07:23	11/12/20 22:58	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	*	0.45	0.040	ug/Kg	☼	10/31/20 07:23	11/12/20 22:58	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*91*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:58*	*1*
13C4 PFHpA	*89*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:58*	*1*
13C4 PFOA	*97*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:58*	*1*
13C5 PFNA	*91*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:58*	*1*
13C2 PFDA	*96*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:58*	*1*
13C2 PFUnA	*87*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:58*	*1*
13C2 PFDoA	*89*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:58*	*1*
13C2 PFTeDA	*83*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:58*	*1*
13C3 PFBS	*83*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:58*	*1*
18O2 PFHxS	*95*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:58*	*1*
13C4 PFOS	*96*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:58*	*1*
d3-NMeFOSAA	*72*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:58*	*1*
d5-NEtFOSAA	*84*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:58*	*1*
13C3 HFPO-DA	*83*		*25 - 150*	*10/31/20 07:23*	*11/12/20 22:58*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**1.5**	**H B**	1.1	0.46	ug/Kg	☼	11/19/20 15:36	11/21/20 22:45	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND	H	4.6	0.89	ug/Kg	☼	11/19/20 15:36	11/21/20 22:45	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND	H	4.6	0.84	ug/Kg	☼	11/19/20 15:36	11/21/20 22:45	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	H	0.46	0.041	ug/Kg	☼	11/19/20 15:36	11/21/20 22:45	1

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66140-1

Client Sample ID: SD-08
Date Collected: 10/22/20 12:26
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-6
Matrix: Solid
Percent Solids: 43.9

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	99		25 - 150	11/19/20 15:36	11/21/20 22:45	1
d3-NMeFOSAA	124		25 - 150	11/19/20 15:36	11/21/20 22:45	1
d5-NEtFOSAA	152	*5	25 - 150	11/19/20 15:36	11/21/20 22:45	1

Client Sample ID: SD-09
Date Collected: 10/22/20 12:42
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-7
Matrix: Solid
Percent Solids: 70.1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.26	0.055	ug/Kg	☼	10/31/20 07:23	11/12/20 23:27	1
Perfluoroheptanoic acid (PFHpA)	ND		0.26	0.038	ug/Kg	☼	10/31/20 07:23	11/12/20 23:27	1
Perfluorooctanoic acid (PFOA)	ND		0.26	0.11	ug/Kg	☼	10/31/20 07:23	11/12/20 23:27	1
Perfluorononanoic acid (PFNA)	ND		0.26	0.047	ug/Kg	☼	10/31/20 07:23	11/12/20 23:27	1
Perfluorodecanoic acid (PFDA)	ND		0.26	0.029	ug/Kg	☼	10/31/20 07:23	11/12/20 23:27	1
Perfluoroundecanoic acid (PFUnA)	ND		0.26	0.047	ug/Kg	☼	10/31/20 07:23	11/12/20 23:27	1
Perfluorododecanoic acid (PFDoA)	ND		0.26	0.087	ug/Kg	☼	10/31/20 07:23	11/12/20 23:27	1
Perfluorotridecanoic acid (PFTriA)	ND		0.26	0.066	ug/Kg	☼	10/31/20 07:23	11/12/20 23:27	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.26	0.070	ug/Kg	☼	10/31/20 07:23	11/12/20 23:27	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.26	0.033	ug/Kg	☼	10/31/20 07:23	11/12/20 23:27	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.26	0.040	ug/Kg	☼	10/31/20 07:23	11/12/20 23:27	1
Perfluorooctanesulfonic acid (PFOS)	**0.37**	**J B ***	0.65	0.26	ug/Kg	☼	10/31/20 07:23	11/12/20 23:27	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.6	0.51	ug/Kg	☼	10/31/20 07:23	11/12/20 23:27	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.6	0.48	ug/Kg	☼	10/31/20 07:23	11/12/20 23:27	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.26	0.035	ug/Kg	☼	10/31/20 07:23	11/12/20 23:27	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.33	0.14	ug/Kg	☼	10/31/20 07:23	11/12/20 23:27	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.26	0.029	ug/Kg	☼	10/31/20 07:23	11/12/20 23:27	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	*	0.26	0.023	ug/Kg	☼	10/31/20 07:23	11/12/20 23:27	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*91*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:27*	*1*
13C4 PFHpA	*94*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:27*	*1*
13C4 PFOA	*96*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:27*	*1*
13C5 PFNA	*86*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:27*	*1*
13C2 PFDA	*91*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:27*	*1*
13C2 PFUnA	*87*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:27*	*1*
13C2 PFDoA	*87*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:27*	*1*
13C2 PFTeDA	*82*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:27*	*1*
13C3 PFBS	*84*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:27*	*1*
18O2 PFHxS	*92*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:27*	*1*
13C4 PFOS	*95*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:27*	*1*
d3-NMeFOSAA	*77*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:27*	*1*
d5-NEtFOSAA	*82*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:27*	*1*
13C3 HFPO-DA	*84*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:27*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**0.50**	**J H B**	0.67	0.27	ug/Kg	☼	11/19/20 15:36	11/21/20 22:54	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND	H	2.7	0.52	ug/Kg	☼	11/19/20 15:36	11/21/20 22:54	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND	H	2.7	0.49	ug/Kg	☼	11/19/20 15:36	11/21/20 22:54	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	H	0.27	0.024	ug/Kg	☼	11/19/20 15:36	11/21/20 22:54	1

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66140-1

Client Sample ID: SD-09
Date Collected: 10/22/20 12:42
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-7
Matrix: Solid
Percent Solids: 70.1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	111		25 - 150	11/19/20 15:36	11/21/20 22:54	1
d3-NMeFOSAA	114		25 - 150	11/19/20 15:36	11/21/20 22:54	1
d5-NEtFOSAA	131		25 - 150	11/19/20 15:36	11/21/20 22:54	1

Client Sample ID: SD-10
Date Collected: 10/22/20 13:20
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-8
Matrix: Solid
Percent Solids: 61.5

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.30	0.063	ug/Kg	☼	10/31/20 07:23	11/12/20 23:36	1
Perfluoroheptanoic acid (PFHpA)	ND		0.30	0.044	ug/Kg	☼	10/31/20 07:23	11/12/20 23:36	1
Perfluorooctanoic acid (PFOA)	ND		0.30	0.13	ug/Kg	☼	10/31/20 07:23	11/12/20 23:36	1
Perfluorononanoic acid (PFNA)	**0.076**	**J**	0.30	0.054	ug/Kg	☼	10/31/20 07:23	11/12/20 23:36	1
Perfluorodecanoic acid (PFDA)	ND		0.30	0.033	ug/Kg	☼	10/31/20 07:23	11/12/20 23:36	1
Perfluoroundecanoic acid (PFUnA)	ND		0.30	0.054	ug/Kg	☼	10/31/20 07:23	11/12/20 23:36	1
Perfluorododecanoic acid (PFDoA)	ND		0.30	0.10	ug/Kg	☼	10/31/20 07:23	11/12/20 23:36	1
Perfluorotridecanoic acid (PFTriA)	ND		0.30	0.077	ug/Kg	☼	10/31/20 07:23	11/12/20 23:36	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.30	0.081	ug/Kg	☼	10/31/20 07:23	11/12/20 23:36	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.30	0.038	ug/Kg	☼	10/31/20 07:23	11/12/20 23:36	1
Perfluorohexanesulfonic acid (PFHxS)	**0.11**	**J**	0.30	0.047	ug/Kg	☼	10/31/20 07:23	11/12/20 23:36	1
Perfluorooctanesulfonic acid (PFOS)	**1.6**	**B ***	0.75	0.30	ug/Kg	☼	10/31/20 07:23	11/12/20 23:36	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		3.0	0.59	ug/Kg	☼	10/31/20 07:23	11/12/20 23:36	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		3.0	0.56	ug/Kg	☼	10/31/20 07:23	11/12/20 23:36	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.30	0.041	ug/Kg	☼	10/31/20 07:23	11/12/20 23:36	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.38	0.17	ug/Kg	☼	10/31/20 07:23	11/12/20 23:36	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.30	0.033	ug/Kg	☼	10/31/20 07:23	11/12/20 23:36	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	*	0.30	0.027	ug/Kg	☼	10/31/20 07:23	11/12/20 23:36	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*100*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:36*	*1*
13C4 PFHpA	*99*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:36*	*1*
13C4 PFOA	*102*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:36*	*1*
13C5 PFNA	*95*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:36*	*1*
13C2 PFDA	*100*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:36*	*1*
13C2 PFUnA	*91*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:36*	*1*
13C2 PFDoA	*85*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:36*	*1*
13C2 PFTeDA	*79*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:36*	*1*
13C3 PFBS	*86*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:36*	*1*
18O2 PFHxS	*99*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:36*	*1*
13C4 PFOS	*97*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:36*	*1*
d3-NMeFOSAA	*80*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:36*	*1*
d5-NEtFOSAA	*93*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:36*	*1*
13C3 HFPO-DA	*90*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:36*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**1.1**	**H B**	0.77	0.31	ug/Kg	☼	11/19/20 15:36	11/21/20 23:03	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND	H	3.1	0.60	ug/Kg	☼	11/19/20 15:36	11/21/20 23:03	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND	H	3.1	0.57	ug/Kg	☼	11/19/20 15:36	11/21/20 23:03	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	H	0.31	0.028	ug/Kg	☼	11/19/20 15:36	11/21/20 23:03	1

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66140-1

Client Sample ID: SD-10
Date Collected: 10/22/20 13:20
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-8
Matrix: Solid
Percent Solids: 61.5

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	98		25 - 150	11/19/20 15:36	11/21/20 23:03	1
d3-NMeFOSAA	116		25 - 150	11/19/20 15:36	11/21/20 23:03	1
d5-NEtFOSAA	136		25 - 150	11/19/20 15:36	11/21/20 23:03	1

Client Sample ID: SD-11
Date Collected: 10/22/20 13:10
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-9
Matrix: Solid
Percent Solids: 71.3

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.26	0.055	ug/Kg	☼	10/31/20 07:23	11/12/20 23:45	1
Perfluoroheptanoic acid (PFHpA)	ND		0.26	0.038	ug/Kg	☼	10/31/20 07:23	11/12/20 23:45	1
Perfluorooctanoic acid (PFOA)	ND		0.26	0.11	ug/Kg	☼	10/31/20 07:23	11/12/20 23:45	1
Perfluorononanoic acid (PFNA)	**0.057**	**J**	0.26	0.047	ug/Kg	☼	10/31/20 07:23	11/12/20 23:45	1
Perfluorodecanoic acid (PFDA)	ND		0.26	0.029	ug/Kg	☼	10/31/20 07:23	11/12/20 23:45	1
Perfluoroundecanoic acid (PFUnA)	ND		0.26	0.047	ug/Kg	☼	10/31/20 07:23	11/12/20 23:45	1
Perfluorododecanoic acid (PFDoA)	ND		0.26	0.088	ug/Kg	☼	10/31/20 07:23	11/12/20 23:45	1
Perfluorotridecanoic acid (PFTriA)	ND		0.26	0.067	ug/Kg	☼	10/31/20 07:23	11/12/20 23:45	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.26	0.071	ug/Kg	☼	10/31/20 07:23	11/12/20 23:45	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.26	0.033	ug/Kg	☼	10/31/20 07:23	11/12/20 23:45	1
Perfluorohexanesulfonic acid (PFHxS)	**0.10**	**J**	0.26	0.041	ug/Kg	☼	10/31/20 07:23	11/12/20 23:45	1
Perfluorooctanesulfonic acid (PFOS)	**1.8**	**B ***	0.66	0.26	ug/Kg	☼	10/31/20 07:23	11/12/20 23:45	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.6	0.51	ug/Kg	☼	10/31/20 07:23	11/12/20 23:45	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.6	0.49	ug/Kg	☼	10/31/20 07:23	11/12/20 23:45	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.26	0.035	ug/Kg	☼	10/31/20 07:23	11/12/20 23:45	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.33	0.14	ug/Kg	☼	10/31/20 07:23	11/12/20 23:45	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.26	0.029	ug/Kg	☼	10/31/20 07:23	11/12/20 23:45	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	*	0.26	0.024	ug/Kg	☼	10/31/20 07:23	11/12/20 23:45	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*94*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:45*	*1*
13C4 PFHpA	*91*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:45*	*1*
13C4 PFOA	*98*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:45*	*1*
13C5 PFNA	*89*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:45*	*1*
13C2 PFDA	*91*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:45*	*1*
13C2 PFUnA	*91*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:45*	*1*
13C2 PFDoA	*77*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:45*	*1*
13C2 PFTeDA	*63*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:45*	*1*
13C3 PFBS	*90*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:45*	*1*
18O2 PFHxS	*94*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:45*	*1*
13C4 PFOS	*97*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:45*	*1*
d3-NMeFOSAA	*77*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:45*	*1*
d5-NEtFOSAA	*83*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:45*	*1*
13C3 HFPO-DA	*86*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:45*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**0.75**	**H B**	0.65	0.26	ug/Kg	☼	11/19/20 15:36	11/21/20 23:13	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND	H	2.6	0.50	ug/Kg	☼	11/19/20 15:36	11/21/20 23:13	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND	H	2.6	0.48	ug/Kg	☼	11/19/20 15:36	11/21/20 23:13	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	H	0.26	0.023	ug/Kg	☼	11/19/20 15:36	11/21/20 23:13	1

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66140-1

Client Sample ID: SD-11
Date Collected: 10/22/20 13:10
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-9
Matrix: Solid
Percent Solids: 71.3

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	105		25 - 150	11/19/20 15:36	11/21/20 23:13	1
d3-NMeFOSAA	118		25 - 150	11/19/20 15:36	11/21/20 23:13	1
d5-NEtFOSAA	135		25 - 150	11/19/20 15:36	11/21/20 23:13	1

Client Sample ID: SD-12
Date Collected: 10/22/20 13:46
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-10
Matrix: Solid
Percent Solids: 57.2

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.35	0.073	ug/Kg	☼	10/31/20 07:23	11/12/20 23:55	1
Perfluoroheptanoic acid (PFHpA)	ND		0.35	0.050	ug/Kg	☼	10/31/20 07:23	11/12/20 23:55	1
Perfluorooctanoic acid (PFOA)	ND		0.35	0.15	ug/Kg	☼	10/31/20 07:23	11/12/20 23:55	1
Perfluorononanoic acid (PFNA)	ND		0.35	0.062	ug/Kg	☼	10/31/20 07:23	11/12/20 23:55	1
Perfluorodecanoic acid (PFDA)	ND		0.35	0.038	ug/Kg	☼	10/31/20 07:23	11/12/20 23:55	1
Perfluoroundecanoic acid (PFUnA)	ND		0.35	0.062	ug/Kg	☼	10/31/20 07:23	11/12/20 23:55	1
Perfluorododecanoic acid (PFDoA)	ND		0.35	0.12	ug/Kg	☼	10/31/20 07:23	11/12/20 23:55	1
Perfluorotridecanoic acid (PFTriA)	ND		0.35	0.088	ug/Kg	☼	10/31/20 07:23	11/12/20 23:55	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.35	0.093	ug/Kg	☼	10/31/20 07:23	11/12/20 23:55	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.35	0.043	ug/Kg	☼	10/31/20 07:23	11/12/20 23:55	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.35	0.054	ug/Kg	☼	10/31/20 07:23	11/12/20 23:55	1
Perfluorooctanesulfonic acid (PFOS)	**0.82**	**J B ***	0.86	0.35	ug/Kg	☼	10/31/20 07:23	11/12/20 23:55	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		3.5	0.67	ug/Kg	☼	10/31/20 07:23	11/12/20 23:55	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		3.5	0.64	ug/Kg	☼	10/31/20 07:23	11/12/20 23:55	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.35	0.047	ug/Kg	☼	10/31/20 07:23	11/12/20 23:55	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.43	0.19	ug/Kg	☼	10/31/20 07:23	11/12/20 23:55	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.35	0.038	ug/Kg	☼	10/31/20 07:23	11/12/20 23:55	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	*	0.35	0.031	ug/Kg	☼	10/31/20 07:23	11/12/20 23:55	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*99*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:55*	*1*
13C4 PFHpA	*104*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:55*	*1*
13C4 PFOA	*108*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:55*	*1*
13C5 PFNA	*99*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:55*	*1*
13C2 PFDA	*95*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:55*	*1*
13C2 PFUnA	*101*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:55*	*1*
13C2 PFDoA	*90*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:55*	*1*
13C2 PFTeDA	*73*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:55*	*1*
13C3 PFBS	*97*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:55*	*1*
18O2 PFHxS	*105*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:55*	*1*
13C4 PFOS	*103*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:55*	*1*
d3-NMeFOSAA	*82*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:55*	*1*
d5-NEtFOSAA	*88*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:55*	*1*
13C3 HFPO-DA	*93*		*25 - 150*	*10/31/20 07:23*	*11/12/20 23:55*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**0.51**	**J H B ***	0.82	0.33	ug/Kg	☼	11/13/20 08:15	11/18/20 00:36	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND	H	3.3	0.64	ug/Kg	☼	11/13/20 08:15	11/18/20 00:36	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND	H	3.3	0.61	ug/Kg	☼	11/13/20 08:15	11/18/20 00:36	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	H	0.33	0.030	ug/Kg	☼	11/13/20 08:15	11/18/20 00:36	1

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66140-1

Client Sample ID: SD-12
Date Collected: 10/22/20 13:46
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-10
Matrix: Solid
Percent Solids: 57.2

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	100		25 - 150	11/13/20 08:15	11/18/20 00:36	1
d3-NMeFOSAA	96		25 - 150	11/13/20 08:15	11/18/20 00:36	1
d5-NEtFOSAA	103		25 - 150	11/13/20 08:15	11/18/20 00:36	1

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66140-1

Client Sample ID: SD-13
Date Collected: 10/22/20 14:05
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-11
Matrix: Solid
Percent Solids: 78.8

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.24**		0.23	0.049	ug/Kg	☼	10/31/20 07:23	11/13/20 00:04	1
Perfluoroheptanoic acid (PFHpA)	**0.079**	**J**	0.23	0.034	ug/Kg	☼	10/31/20 07:23	11/13/20 00:04	1
Perfluorooctanoic acid (PFOA)	**0.15**	**J**	0.23	0.10	ug/Kg	☼	10/31/20 07:23	11/13/20 00:04	1
Perfluorononanoic acid (PFNA)	**0.14**	**J**	0.23	0.042	ug/Kg	☼	10/31/20 07:23	11/13/20 00:04	1
Perfluorodecanoic acid (PFDA)	**0.63**		0.23	0.026	ug/Kg	☼	10/31/20 07:23	11/13/20 00:04	1
Perfluoroundecanoic acid (PFUnA)	**0.26**	**F1**	0.23	0.042	ug/Kg	☼	10/31/20 07:23	11/13/20 00:04	1
Perfluorododecanoic acid (PFDoA)	**0.32**		0.23	0.078	ug/Kg	☼	10/31/20 07:23	11/13/20 00:04	1
Perfluorotridecanoic acid (PFTriA)	ND		0.23	0.060	ug/Kg	☼	10/31/20 07:23	11/13/20 00:04	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.23	0.063	ug/Kg	☼	10/31/20 07:23	11/13/20 00:04	1
Perfluorobutanesulfonic acid (PFBS)	**0.036**	**J**	0.23	0.029	ug/Kg	☼	10/31/20 07:23	11/13/20 00:04	1
Perfluorohexanesulfonic acid (PFHxS)	ND	G	2.2	2.2	ug/Kg	☼	10/31/20 07:23	11/13/20 00:04	1
Perfluorooctanesulfonic acid (PFOS)	**3.2**	**F2 B F1 ***	0.58	0.23	ug/Kg	☼	10/31/20 07:23	11/13/20 00:04	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.3	0.46	ug/Kg	☼	10/31/20 07:23	11/13/20 00:04	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.3	0.43	ug/Kg	☼	10/31/20 07:23	11/13/20 00:04	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.23	0.032	ug/Kg	☼	10/31/20 07:23	11/13/20 00:04	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.29	0.13	ug/Kg	☼	10/31/20 07:23	11/13/20 00:04	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.23	0.026	ug/Kg	☼	10/31/20 07:23	11/13/20 00:04	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	*	0.23	0.021	ug/Kg	☼	10/31/20 07:23	11/13/20 00:04	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*105*		*25 - 150*	*10/31/20 07:23*	*11/13/20 00:04*	*1*
13C4 PFHpA	*100*		*25 - 150*	*10/31/20 07:23*	*11/13/20 00:04*	*1*
13C4 PFOA	*105*		*25 - 150*	*10/31/20 07:23*	*11/13/20 00:04*	*1*
13C5 PFNA	*96*		*25 - 150*	*10/31/20 07:23*	*11/13/20 00:04*	*1*
13C2 PFDA	*89*		*25 - 150*	*10/31/20 07:23*	*11/13/20 00:04*	*1*
13C2 PFUnA	*101*		*25 - 150*	*10/31/20 07:23*	*11/13/20 00:04*	*1*
13C2 PFDoA	*79*		*25 - 150*	*10/31/20 07:23*	*11/13/20 00:04*	*1*
13C2 PFTeDA	*72*		*25 - 150*	*10/31/20 07:23*	*11/13/20 00:04*	*1*
13C3 PFBS	*99*		*25 - 150*	*10/31/20 07:23*	*11/13/20 00:04*	*1*
18O2 PFHxS	*100*		*25 - 150*	*10/31/20 07:23*	*11/13/20 00:04*	*1*
13C4 PFOS	*104*		*25 - 150*	*10/31/20 07:23*	*11/13/20 00:04*	*1*
d3-NMeFOSAA	*60*		*25 - 150*	*10/31/20 07:23*	*11/13/20 00:04*	*1*
d5-NEtFOSAA	*60*		*25 - 150*	*10/31/20 07:23*	*11/13/20 00:04*	*1*
13C3 HFPO-DA	*95*		*25 - 150*	*10/31/20 07:23*	*11/13/20 00:04*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	**2.8**	**H B**	0.62	0.25	ug/Kg	☼	11/19/20 15:36	11/21/20 23:41	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND	H	2.5	0.48	ug/Kg	☼	11/19/20 15:36	11/21/20 23:41	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND	H	2.5	0.46	ug/Kg	☼	11/19/20 15:36	11/21/20 23:41	1

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66140-1

Client Sample ID: SD-13
Date Collected: 10/22/20 14:05
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-11
Matrix: Solid
Percent Solids: 78.8

Method: 537 (modified) - Fluorinated Alkyl Substances - RE (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	H	0.25	0.022	ug/Kg	☼	11/19/20 15:36	11/21/20 23:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*99*		*25 - 150*	*11/19/20 15:36*	*11/21/20 23:41*	*1*
d3-NMeFOSAA	*106*		*25 - 150*	*11/19/20 15:36*	*11/21/20 23:41*	*1*
d5-NEtFOSAA	*112*		*25 - 150*	*11/19/20 15:36*	*11/21/20 23:41*	*1*

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66140-1

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)	PFDoA (25-150)	PFTDA (25-150)
320-66140-1	SD-01	105	103	100	97	98	92	97	90
320-66140-1 - RE	SD-01								
320-66140-1 MS - RE	SD-01								
320-66140-1 MSD - RE	SD-01								
320-66140-2	SD-02	85	95	96	95	92	91	80	70
320-66140-2 - RE	SD-02								
320-66140-3	SD-03	85	93	97	90	91	93	86	66
320-66140-3 - RE	SD-03								
320-66140-4	SD-04	100	102	101	99	96	104	94	83
320-66140-4 - RE	SD-04								
320-66140-5	SD-06	103	105	104	96	91	97	85	80
320-66140-5 - RE	SD-06								
320-66140-6	SD-08	91	89	97	91	96	87	89	83
320-66140-6 - RE	SD-08								
320-66140-7	SD-09	91	94	96	86	91	87	87	82
320-66140-7 - RE	SD-09								
320-66140-8	SD-10	100	99	102	95	100	91	85	79
320-66140-8 - RE	SD-10								
320-66140-9	SD-11	94	91	98	89	91	91	77	63
320-66140-9 - RE	SD-11								
320-66140-10	SD-12	99	104	108	99	95	101	90	73
320-66140-10 - RE	SD-12								
320-66140-11	SD-13	105	100	105	96	89	101	79	72
320-66140-11 - RE	SD-13								
320-66140-11 MS	SD-13	102	102	103	100	97	90	82	78
320-66140-11 MS - RE	SD-13								
320-66140-11 MSD	SD-13	96	97	98	92	80	81	84	67
320-66140-11 MSD - RE	SD-13								
LCS 320-427297/2-A	Lab Control Sample	93	102	104	90	87	90	84	94
LCS 320-431353/2-A	Lab Control Sample								
LCS 320-433672/2-A	Lab Control Sample								
MB 320-427297/1-A	Method Blank	94	101	102	87	93	87	82	88
MB 320-431353/1-A	Method Blank								
MB 320-433672/1-A	Method Blank								

		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)		
320-66140-1	SD-01	94	98	90	71	68	99		
320-66140-1 - RE	SD-01			87	95	101			
320-66140-1 MS - RE	SD-01			95	93	96			
320-66140-1 MSD - RE	SD-01			84	77	78			
320-66140-2	SD-02	87	93	94	81	80	81		
320-66140-2 - RE	SD-02			101	107	113			
320-66140-3	SD-03	89	92	96	88	88	83		
320-66140-3 - RE	SD-03			92	106	93			
320-66140-4	SD-04	94	100	97	79	86	94		
320-66140-4 - RE	SD-04			89	85	89			
320-66140-5	SD-06	101	101	104	69	73	100		
320-66140-5 - RE	SD-06			96	112	121			

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66140-1

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	C3PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	d3NMFOS (25-150)	d5NEFOS (25-150)	HFPODA (25-150)		
320-66140-6	SD-08	83	95	96	72	84	83		
320-66140-6 - RE	SD-08			99	124	152 *5			
320-66140-7	SD-09	84	92	95	77	82	84		
320-66140-7 - RE	SD-09			111	114	131			
320-66140-8	SD-10	86	99	97	80	93	90		
320-66140-8 - RE	SD-10			98	116	136			
320-66140-9	SD-11	90	94	97	77	83	86		
320-66140-9 - RE	SD-11			105	118	135			
320-66140-10	SD-12	97	105	103	82	88	93		
320-66140-10 - RE	SD-12			100	96	103			
320-66140-11	SD-13	99	100	104	60	60	95		
320-66140-11 - RE	SD-13			99	106	112			
320-66140-11 MS	SD-13	97	100	98	78	71	98		
320-66140-11 MS - RE	SD-13			94	100	109			
320-66140-11 MSD	SD-13	89	92	91	64	61	91		
320-66140-11 MSD - RE	SD-13			100	113	115			
LCS 320-427297/2-A	Lab Control Sample	94	100	94	15 *5	16 *5	96		
LCS 320-431353/2-A	Lab Control Sample			94	52	54			
LCS 320-433672/2-A	Lab Control Sample			89	94	103			
MB 320-427297/1-A	Method Blank	96	100	99	1 *5	1 *5	98		
MB 320-431353/1-A	Method Blank			97	94	97			
MB 320-433672/1-A	Method Blank			89	96	102			

Surrogate Legend

PFHxA = 13C2 PFHxA
C4PFHA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA
PFUnA = 13C2 PFUnA
PFDoA = 13C2 PFDoA
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

Lab Sample ID: MB 320-427297/1-A
Matrix: Solid
Analysis Batch: 431076

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 427297

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.042	ug/Kg		10/31/20 07:23	11/12/20 21:53	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.029	ug/Kg		10/31/20 07:23	11/12/20 21:53	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.086	ug/Kg		10/31/20 07:23	11/12/20 21:53	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.036	ug/Kg		10/31/20 07:23	11/12/20 21:53	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg		10/31/20 07:23	11/12/20 21:53	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036	ug/Kg		10/31/20 07:23	11/12/20 21:53	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.067	ug/Kg		10/31/20 07:23	11/12/20 21:53	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051	ug/Kg		10/31/20 07:23	11/12/20 21:53	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054	ug/Kg		10/31/20 07:23	11/12/20 21:53	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg		10/31/20 07:23	11/12/20 21:53	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.031	ug/Kg		10/31/20 07:23	11/12/20 21:53	1
Perfluorooctanesulfonic acid (PFOS)	9.57		0.50	0.20	ug/Kg		10/31/20 07:23	11/12/20 21:53	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg		10/31/20 07:23	11/12/20 21:53	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg		10/31/20 07:23	11/12/20 21:53	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.027	ug/Kg		10/31/20 07:23	11/12/20 21:53	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.25	0.11	ug/Kg		10/31/20 07:23	11/12/20 21:53	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.022	ug/Kg		10/31/20 07:23	11/12/20 21:53	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg		10/31/20 07:23	11/12/20 21:53	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*94*		*25 - 150*	*10/31/20 07:23*	*11/12/20 21:53*	*1*
13C4 PFHpA	*101*		*25 - 150*	*10/31/20 07:23*	*11/12/20 21:53*	*1*
13C4 PFOA	*102*		*25 - 150*	*10/31/20 07:23*	*11/12/20 21:53*	*1*
13C5 PFNA	*87*		*25 - 150*	*10/31/20 07:23*	*11/12/20 21:53*	*1*
13C2 PFDA	*93*		*25 - 150*	*10/31/20 07:23*	*11/12/20 21:53*	*1*
13C2 PFUnA	*87*		*25 - 150*	*10/31/20 07:23*	*11/12/20 21:53*	*1*
13C2 PFDoA	*82*		*25 - 150*	*10/31/20 07:23*	*11/12/20 21:53*	*1*
13C2 PFTeDA	*88*		*25 - 150*	*10/31/20 07:23*	*11/12/20 21:53*	*1*
13C3 PFBS	*96*		*25 - 150*	*10/31/20 07:23*	*11/12/20 21:53*	*1*
18O2 PFHxS	*100*		*25 - 150*	*10/31/20 07:23*	*11/12/20 21:53*	*1*
13C4 PFOS	*99*		*25 - 150*	*10/31/20 07:23*	*11/12/20 21:53*	*1*
d3-NMeFOSAA	*1*	**5*	*25 - 150*	*10/31/20 07:23*	*11/12/20 21:53*	*1*
d5-NEtFOSAA	*1*	**5*	*25 - 150*	*10/31/20 07:23*	*11/12/20 21:53*	*1*
13C3 HFPO-DA	*98*		*25 - 150*	*10/31/20 07:23*	*11/12/20 21:53*	*1*

Lab Sample ID: LCS 320-427297/2-A
Matrix: Solid
Analysis Batch: 431076

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 427297

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	2.00	2.00		ug/Kg		100	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	1.95		ug/Kg		98	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	1.73		ug/Kg		87	72 - 132
Perfluorononanoic acid (PFNA)	2.00	2.02		ug/Kg		101	73 - 133

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-427297/2-A
Matrix: Solid
Analysis Batch: 431076

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 427297

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorodecanoic acid (PFDA)	2.00	2.08		ug/Kg		104	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	1.90		ug/Kg		95	66 - 126
Perfluorododecanoic acid (PFDoA)	2.00	2.13		ug/Kg		107	71 - 131
Perfluorotridecanoic acid (PFTriA)	2.00	2.43		ug/Kg		122	71 - 131
Perfluorotetradecanoic acid (PFTeA)	2.00	2.01		ug/Kg		101	67 - 127
Perfluorobutanesulfonic acid (PFBS)	1.77	1.79		ug/Kg		101	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.72		ug/Kg		95	62 - 122
Perfluorooctanesulfonic acid (PFOS)	1.86	8.98	*	ug/Kg		484	68 - 141
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	1.86	1.71		ug/Kg		92	74 - 134
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	2.00	1.97		ug/Kg		99	53 - 158
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	1.88	1.81		ug/Kg		96	66 - 136
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.88	0.691	*	ug/Kg		37	79 - 139

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*93*		*25 - 150*
13C4 PFHpA	*102*		*25 - 150*
13C4 PFOA	*104*		*25 - 150*
13C5 PFNA	*90*		*25 - 150*
13C2 PFDA	*87*		*25 - 150*
13C2 PFUnA	*90*		*25 - 150*
13C2 PFDoA	*84*		*25 - 150*
13C2 PFTeDA	*94*		*25 - 150*
13C3 PFBS	*94*		*25 - 150*
18O2 PFHxS	*100*		*25 - 150*
13C4 PFOS	*94*		*25 - 150*
d3-NMeFOSAA	*15*	**5*	*25 - 150*
d5-NEtFOSAA	*16*	**5*	*25 - 150*
13C3 HFPO-DA	*96*		*25 - 150*

Lab Sample ID: 320-66140-11 MS
Matrix: Solid
Analysis Batch: 431076

Client Sample ID: SD-13
Prep Type: Total/NA
Prep Batch: 427297

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	0.24		2.32	2.67		ug/Kg	☼	104	71 - 131
Perfluoroheptanoic acid (PFHpA)	0.079	J	2.32	2.36		ug/Kg	☼	98	71 - 131
Perfluorooctanoic acid (PFOA)	0.15	J	2.32	2.26		ug/Kg	☼	91	72 - 132
Perfluorononanoic acid (PFNA)	0.14	J	2.32	2.54		ug/Kg	☼	104	73 - 133
Perfluorodecanoic acid (PFDA)	0.63		2.32	2.80		ug/Kg	☼	93	72 - 132
Perfluoroundecanoic acid (PFUnA)	0.26	F1	2.32	3.08		ug/Kg	☼	121	66 - 126

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-66140-11 MS
Matrix: Solid
Analysis Batch: 431076

Client Sample ID: SD-13
Prep Type: Total/NA
Prep Batch: 427297

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorododecanoic acid (PFDoA)	0.32		2.32	3.00		ug/Kg	☼	115	71 - 131
Perfluorotridecanoic acid (PFTriA)	ND		2.32	2.42		ug/Kg	☼	104	71 - 131
Perfluorotetradecanoic acid (PFTeA)	ND		2.32	2.25		ug/Kg	☼	97	67 - 127
Perfluorobutanesulfonic acid (PFBS)	0.036	J	2.05	2.14		ug/Kg	☼	102	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	ND	G	2.11	2.50		ug/Kg	☼	118	62 - 122
Perfluorooctanesulfonic acid (PFOS)	3.2	F2 B F1 *	2.15	9.66	F1	ug/Kg	☼	298	68 - 141
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.16	2.49		ug/Kg	☼	115	74 - 134
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		2.32	2.36		ug/Kg	☼	101	53 - 158
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.19	2.32		ug/Kg	☼	106	66 - 136
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	*	2.19	2.27		ug/Kg	☼	104	79 - 139

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C2 PFHxA	*102*		*25 - 150*
13C4 PFHpA	*102*		*25 - 150*
13C4 PFOA	*103*		*25 - 150*
13C5 PFNA	*100*		*25 - 150*
13C2 PFDA	*97*		*25 - 150*
13C2 PFUnA	*90*		*25 - 150*
13C2 PFDoA	*82*		*25 - 150*
13C2 PFTeDA	*78*		*25 - 150*
13C3 PFBS	*97*		*25 - 150*
18O2 PFHxS	*100*		*25 - 150*
13C4 PFOS	*98*		*25 - 150*
d3-NMeFOSAA	*78*		*25 - 150*
d5-NEtFOSAA	*71*		*25 - 150*
13C3 HFPO-DA	*98*		*25 - 150*

Lab Sample ID: 320-66140-11 MSD
Matrix: Solid
Analysis Batch: 431076

Client Sample ID: SD-13
Prep Type: Total/NA
Prep Batch: 427297

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	0.24		2.34	2.56		ug/Kg	☼	99	71 - 131	4	30
Perfluoroheptanoic acid (PFHpA)	0.079	J	2.34	2.33		ug/Kg	☼	96	71 - 131	1	30
Perfluorooctanoic acid (PFOA)	0.15	J	2.34	2.37		ug/Kg	☼	95	72 - 132	5	30
Perfluorononanoic acid (PFNA)	0.14	J	2.34	2.46		ug/Kg	☼	99	73 - 133	3	30
Perfluorodecanoic acid (PFDA)	0.63		2.34	3.37		ug/Kg	☼	117	72 - 132	18	30
Perfluoroundecanoic acid (PFUnA)	0.26	F1	2.34	3.30	F1	ug/Kg	☼	130	66 - 126	7	30
Perfluorododecanoic acid (PFDoA)	0.32		2.34	2.64		ug/Kg	☼	99	71 - 131	13	30

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-66140-11 MSD
Matrix: Solid
Analysis Batch: 431076

Client Sample ID: SD-13
Prep Type: Total/NA
Prep Batch: 427297

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorotridecanoic acid (PFTriA)	ND		2.34	2.26		ug/Kg	☼	97	71 - 131	7	30
Perfluorotetradecanoic acid (PFTeA)	ND		2.34	2.42		ug/Kg	☼	103	67 - 127	7	30
Perfluorobutanesulfonic acid (PFBS)	0.036	J	2.07	2.30		ug/Kg	☼	110	69 - 129	7	30
Perfluorohexanesulfonic acid (PFHxS)	ND	G	2.13	2.53		ug/Kg	☼	119	62 - 122	1	30
Perfluorooctanesulfonic acid (PFOS)	3.2	F2 B F1 *	2.17	5.73	F2	ug/Kg	☼	115	68 - 141	51	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.18	2.50		ug/Kg	☼	115	74 - 134	0	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		2.34	2.36		ug/Kg	☼	101	53 - 158	0	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.20	2.52		ug/Kg	☼	114	66 - 136	8	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	*	2.20	2.32		ug/Kg	☼	105	79 - 139	2	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C2 PFHxA	*96*		*25 - 150*
13C4 PFHpA	*97*		*25 - 150*
13C4 PFOA	*98*		*25 - 150*
13C5 PFNA	*92*		*25 - 150*
13C2 PFDA	*80*		*25 - 150*
13C2 PFUnA	*81*		*25 - 150*
13C2 PFDoA	*84*		*25 - 150*
13C2 PFTeDA	*67*		*25 - 150*
13C3 PFBS	*89*		*25 - 150*
18O2 PFHxS	*92*		*25 - 150*
13C4 PFOS	*91*		*25 - 150*
d3-NMeFOSAA	*64*		*25 - 150*
d5-NEtFOSAA	*61*		*25 - 150*
13C3 HFPO-DA	*91*		*25 - 150*

Lab Sample ID: MB 320-431353/1-A
Matrix: Solid
Analysis Batch: 432941

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 431353

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.299	J	0.50	0.20	ug/Kg		11/13/20 08:15	11/17/20 21:57	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg		11/13/20 08:15	11/17/20 21:57	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg		11/13/20 08:15	11/17/20 21:57	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg		11/13/20 08:15	11/17/20 21:57	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*97*		*25 - 150*	*11/13/20 08:15*	*11/17/20 21:57*	*1*
d3-NMeFOSAA	*94*		*25 - 150*	*11/13/20 08:15*	*11/17/20 21:57*	*1*
d5-NEtFOSAA	*97*		*25 - 150*	*11/13/20 08:15*	*11/17/20 21:57*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: LCS 320-431353/2-A
Matrix: Solid
Analysis Batch: 432941

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 431353

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Perfluorooctanesulfonic acid (PFOS)			1.86	2.94	*	ug/Kg		159	68 - 141		
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)			1.88	2.12		ug/Kg		112	79 - 139		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFOS	*94*		*25 - 150*
d3-NMeFOSAA	*52*		*25 - 150*
d5-NEtFOSAA	*54*		*25 - 150*

Lab Sample ID: MB 320-433672/1-A
Matrix: Solid
Analysis Batch: 434398

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 433672

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.240	J	0.50	0.20	ug/Kg		11/19/20 15:36	11/21/20 21:58	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg		11/19/20 15:36	11/21/20 21:58	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg		11/19/20 15:36	11/21/20 21:58	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg		11/19/20 15:36	11/21/20 21:58	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFOS	*89*		*25 - 150*	*11/19/20 15:36*	*11/21/20 21:58*	*1*
d3-NMeFOSAA	*96*		*25 - 150*	*11/19/20 15:36*	*11/21/20 21:58*	*1*
d5-NEtFOSAA	*102*		*25 - 150*	*11/19/20 15:36*	*11/21/20 21:58*	*1*

Lab Sample ID: LCS 320-433672/2-A
Matrix: Solid
Analysis Batch: 434398

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 433672

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Perfluorooctanesulfonic acid (PFOS)			1.86	2.37		ug/Kg		127	68 - 141		
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)			1.88	2.15		ug/Kg		114	79 - 139		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFOS	*89*		*25 - 150*
d3-NMeFOSAA	*94*		*25 - 150*
d5-NEtFOSAA	*103*		*25 - 150*

Method: 537 (modified) - Fluorinated Alkyl Substances - RE

Lab Sample ID: 320-66140-1 MS
Matrix: Solid
Analysis Batch: 432941

Client Sample ID: SD-01
Prep Type: Total/NA
Prep Batch: 431353

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS) - RE	0.39	J H B *	2.06	2.55		ug/Kg	☼	105	68 - 141
4,8-Dioxa-3H-perfluorononanoic acid (ADONA) - RE	ND	H	2.09	2.44		ug/Kg	☼	117	79 - 139

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C4 PFOS - RE	*95*		*25 - 150*
d3-NMeFOSAA - RE	*93*		*25 - 150*
d5-NEtFOSAA - RE	*96*		*25 - 150*

Lab Sample ID: 320-66140-1 MSD
Matrix: Solid
Analysis Batch: 432941

Client Sample ID: SD-01
Prep Type: Total/NA
Prep Batch: 431353

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS) - RE	0.39	J H B *	2.12	2.67		ug/Kg	☼	107	68 - 141	4	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA) - RE	ND	H	2.15	2.43		ug/Kg	☼	113	79 - 139	1	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C4 PFOS - RE	*84*		*25 - 150*
d3-NMeFOSAA - RE	*77*		*25 - 150*
d5-NEtFOSAA - RE	*78*		*25 - 150*

Lab Sample ID: 320-66140-11 MS
Matrix: Solid
Analysis Batch: 434398

Client Sample ID: SD-13
Prep Type: Total/NA
Prep Batch: 433672

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS) - RE	2.8	H B	2.27	4.60		ug/Kg	☼	78	68 - 141
4,8-Dioxa-3H-perfluorononanoic acid (ADONA) - RE	ND	H	2.31	2.60		ug/Kg	☼	113	79 - 139

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C4 PFOS - RE	*94*		*25 - 150*
d3-NMeFOSAA - RE	*100*		*25 - 150*
d5-NEtFOSAA - RE	*109*		*25 - 150*

Lab Sample ID: 320-66140-11 MSD
Matrix: Solid
Analysis Batch: 434398

Client Sample ID: SD-13
Prep Type: Total/NA
Prep Batch: 433672

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorooctanesulfonic acid (PFOS) - RE	2.8	H B	2.31	4.63		ug/Kg	☼	78	68 - 141	1	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA) - RE	ND	H	2.35	2.50		ug/Kg	☼	106	79 - 139	4	30

Method: 537 (modified) - Fluorinated Alkyl Substances - RE (Continued)

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C4 PFOS - RE	100		25 - 150
d3-NMeFOSAA - RE	113		25 - 150
d5-NEtFOSAA - RE	115		25 - 150

LCMS

Prep Batch: 427297

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66140-1	SD-01	Total/NA	Solid	SHAKE	
320-66140-2	SD-02	Total/NA	Solid	SHAKE	
320-66140-3	SD-03	Total/NA	Solid	SHAKE	
320-66140-4	SD-04	Total/NA	Solid	SHAKE	
320-66140-5	SD-06	Total/NA	Solid	SHAKE	
320-66140-6	SD-08	Total/NA	Solid	SHAKE	
320-66140-7	SD-09	Total/NA	Solid	SHAKE	
320-66140-8	SD-10	Total/NA	Solid	SHAKE	
320-66140-9	SD-11	Total/NA	Solid	SHAKE	
320-66140-10	SD-12	Total/NA	Solid	SHAKE	
320-66140-11	SD-13	Total/NA	Solid	SHAKE	
MB 320-427297/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-427297/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-66140-11 MS	SD-13	Total/NA	Solid	SHAKE	
320-66140-11 MSD	SD-13	Total/NA	Solid	SHAKE	

Analysis Batch: 431076

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66140-1	SD-01	Total/NA	Solid	537 (modified)	427297
320-66140-2	SD-02	Total/NA	Solid	537 (modified)	427297
320-66140-3	SD-03	Total/NA	Solid	537 (modified)	427297
320-66140-4	SD-04	Total/NA	Solid	537 (modified)	427297
320-66140-5	SD-06	Total/NA	Solid	537 (modified)	427297
320-66140-6	SD-08	Total/NA	Solid	537 (modified)	427297
320-66140-7	SD-09	Total/NA	Solid	537 (modified)	427297
320-66140-8	SD-10	Total/NA	Solid	537 (modified)	427297
320-66140-9	SD-11	Total/NA	Solid	537 (modified)	427297
320-66140-10	SD-12	Total/NA	Solid	537 (modified)	427297
320-66140-11	SD-13	Total/NA	Solid	537 (modified)	427297
MB 320-427297/1-A	Method Blank	Total/NA	Solid	537 (modified)	427297
LCS 320-427297/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	427297
320-66140-11 MS	SD-13	Total/NA	Solid	537 (modified)	427297
320-66140-11 MSD	SD-13	Total/NA	Solid	537 (modified)	427297

Prep Batch: 431353

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66140-1 - RE	SD-01	Total/NA	Solid	SHAKE	
320-66140-2 - RE	SD-02	Total/NA	Solid	SHAKE	
320-66140-3 - RE	SD-03	Total/NA	Solid	SHAKE	
320-66140-4 - RE	SD-04	Total/NA	Solid	SHAKE	
320-66140-10 - RE	SD-12	Total/NA	Solid	SHAKE	
MB 320-431353/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-431353/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-66140-1 MS - RE	SD-01	Total/NA	Solid	SHAKE	
320-66140-1 MSD - RE	SD-01	Total/NA	Solid	SHAKE	

Analysis Batch: 432941

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66140-1 - RE	SD-01	Total/NA	Solid	537 (modified)	431353
320-66140-2 - RE	SD-02	Total/NA	Solid	537 (modified)	431353
320-66140-3 - RE	SD-03	Total/NA	Solid	537 (modified)	431353

LCMS (Continued)

Analysis Batch: 432941 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66140-4 - RE	SD-04	Total/NA	Solid	537 (modified)	431353
320-66140-10 - RE	SD-12	Total/NA	Solid	537 (modified)	431353
MB 320-431353/1-A	Method Blank	Total/NA	Solid	537 (modified)	431353
LCS 320-431353/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	431353
320-66140-1 MS - RE	SD-01	Total/NA	Solid	537 (modified)	431353
320-66140-1 MSD - RE	SD-01	Total/NA	Solid	537 (modified)	431353

Prep Batch: 433672

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66140-5 - RE	SD-06	Total/NA	Solid	SHAKE	
320-66140-6 - RE	SD-08	Total/NA	Solid	SHAKE	
320-66140-7 - RE	SD-09	Total/NA	Solid	SHAKE	
320-66140-8 - RE	SD-10	Total/NA	Solid	SHAKE	
320-66140-9 - RE	SD-11	Total/NA	Solid	SHAKE	
320-66140-11 - RE	SD-13	Total/NA	Solid	SHAKE	
MB 320-433672/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-433672/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-66140-11 MS - RE	SD-13	Total/NA	Solid	SHAKE	
320-66140-11 MSD - RE	SD-13	Total/NA	Solid	SHAKE	

Analysis Batch: 434398

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66140-5 - RE	SD-06	Total/NA	Solid	537 (modified)	433672
320-66140-6 - RE	SD-08	Total/NA	Solid	537 (modified)	433672
320-66140-7 - RE	SD-09	Total/NA	Solid	537 (modified)	433672
320-66140-8 - RE	SD-10	Total/NA	Solid	537 (modified)	433672
320-66140-9 - RE	SD-11	Total/NA	Solid	537 (modified)	433672
320-66140-11 - RE	SD-13	Total/NA	Solid	537 (modified)	433672
MB 320-433672/1-A	Method Blank	Total/NA	Solid	537 (modified)	433672
LCS 320-433672/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	433672
320-66140-11 MS - RE	SD-13	Total/NA	Solid	537 (modified)	433672
320-66140-11 MSD - RE	SD-13	Total/NA	Solid	537 (modified)	433672

General Chemistry

Analysis Batch: 426968

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66140-1	SD-01	Total/NA	Solid	D 2216	
320-66140-2	SD-02	Total/NA	Solid	D 2216	
320-66140-3	SD-03	Total/NA	Solid	D 2216	
320-66140-4	SD-04	Total/NA	Solid	D 2216	
320-66140-5	SD-06	Total/NA	Solid	D 2216	
320-66140-6	SD-08	Total/NA	Solid	D 2216	
320-66140-7	SD-09	Total/NA	Solid	D 2216	
320-66140-8	SD-10	Total/NA	Solid	D 2216	
320-66140-9	SD-11	Total/NA	Solid	D 2216	
320-66140-10	SD-12	Total/NA	Solid	D 2216	
320-66140-11	SD-13	Total/NA	Solid	D 2216	

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66140-1

Client Sample ID: SD-01
Date Collected: 10/20/20 16:10
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-1
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			426968	10/30/20 12:54	KDB	TAL SAC

Client Sample ID: SD-01
Date Collected: 10/20/20 16:10
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-1
Matrix: Solid
Percent Solids: 85.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.30 g	10.0 mL	427297	10/31/20 07:23	CG	TAL SAC
Total/NA	Analysis	537 (modified)		1			431076	11/12/20 22:11	K1S	TAL SAC
Total/NA	Prep	SHAKE	RE		5.14 g	10.0 mL	431353	11/13/20 08:15	NSS	TAL SAC
Total/NA	Analysis	537 (modified)	RE	1			432941	11/17/20 22:34	S1M	TAL SAC

Client Sample ID: SD-02
Date Collected: 10/20/20 16:41
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-2
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			426968	10/30/20 12:54	KDB	TAL SAC

Client Sample ID: SD-02
Date Collected: 10/20/20 16:41
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-2
Matrix: Solid
Percent Solids: 56.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.39 g	10.0 mL	427297	10/31/20 07:23	CG	TAL SAC
Total/NA	Analysis	537 (modified)		1			431076	11/12/20 22:21	K1S	TAL SAC
Total/NA	Prep	SHAKE	RE		5.34 g	10.0 mL	431353	11/13/20 08:15	NSS	TAL SAC
Total/NA	Analysis	537 (modified)	RE	1			432941	11/17/20 23:02	S1M	TAL SAC

Client Sample ID: SD-03
Date Collected: 10/20/20 16:31
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-3
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			426968	10/30/20 12:54	KDB	TAL SAC

Client Sample ID: SD-03
Date Collected: 10/20/20 16:31
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-3
Matrix: Solid
Percent Solids: 77.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.34 g	10.0 mL	427297	10/31/20 07:23	CG	TAL SAC
Total/NA	Analysis	537 (modified)		1			431076	11/12/20 22:30	K1S	TAL SAC
Total/NA	Prep	SHAKE	RE		5.49 g	10.0 mL	431353	11/13/20 08:15	NSS	TAL SAC
Total/NA	Analysis	537 (modified)	RE	1			432941	11/17/20 23:11	S1M	TAL SAC

Client Sample ID: SD-04
Lab Sample ID: 320-66140-4
Date Collected: 10/20/20 17:01
Matrix: Solid
Date Received: 10/29/20 10:55

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			426968	10/30/20 12:54	KDB	TAL SAC

Client Sample ID: SD-04
Lab Sample ID: 320-66140-4
Date Collected: 10/20/20 17:01
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 71.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.04 g	10.0 mL	427297	10/31/20 07:23	CG	TAL SAC
Total/NA	Analysis	537 (modified)		1			431076	11/12/20 22:40	K1S	TAL SAC
Total/NA	Prep	SHAKE	RE		5.33 g	10.0 mL	431353	11/13/20 08:15	NSS	TAL SAC
Total/NA	Analysis	537 (modified)	RE	1			432941	11/17/20 23:21	S1M	TAL SAC

Client Sample ID: SD-06
Lab Sample ID: 320-66140-5
Date Collected: 10/22/20 11:46
Matrix: Solid
Date Received: 10/29/20 10:55

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			426968	10/30/20 12:54	KDB	TAL SAC

Client Sample ID: SD-06
Lab Sample ID: 320-66140-5
Date Collected: 10/22/20 11:46
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 84.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.38 g	10.0 mL	427297	10/31/20 07:23	CG	TAL SAC
Total/NA	Analysis	537 (modified)		1			431076	11/12/20 22:49	K1S	TAL SAC
Total/NA	Prep	SHAKE	RE		5.38 g	10.00 mL	433672	11/19/20 15:36	GWO	TAL SAC
Total/NA	Analysis	537 (modified)	RE	1			434398	11/21/20 22:35	D1R	TAL SAC

Client Sample ID: SD-08
Lab Sample ID: 320-66140-6
Date Collected: 10/22/20 12:26
Matrix: Solid
Date Received: 10/29/20 10:55

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			426968	10/30/20 12:54	KDB	TAL SAC

Client Sample ID: SD-08
Lab Sample ID: 320-66140-6
Date Collected: 10/22/20 12:26
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 43.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.11 g	10.0 mL	427297	10/31/20 07:23	CG	TAL SAC
Total/NA	Analysis	537 (modified)		1			431076	11/12/20 22:58	K1S	TAL SAC
Total/NA	Prep	SHAKE	RE		5.00 g	10.00 mL	433672	11/19/20 15:36	GWO	TAL SAC
Total/NA	Analysis	537 (modified)	RE	1			434398	11/21/20 22:45	D1R	TAL SAC

Client Sample ID: SD-09
Date Collected: 10/22/20 12:42
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-7
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			426968	10/30/20 12:54	KDB	TAL SAC

Client Sample ID: SD-09
Date Collected: 10/22/20 12:42
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-7
Matrix: Solid
Percent Solids: 70.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.48 g	10.0 mL	427297	10/31/20 07:23	CG	TAL SAC
Total/NA	Analysis	537 (modified)		1			431076	11/12/20 23:27	K1S	TAL SAC
Total/NA	Prep	SHAKE	RE		5.33 g	10.00 mL	433672	11/19/20 15:36	GWO	TAL SAC
Total/NA	Analysis	537 (modified)	RE	1			434398	11/21/20 22:54	D1R	TAL SAC

Client Sample ID: SD-10
Date Collected: 10/22/20 13:20
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-8
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			426968	10/30/20 12:54	KDB	TAL SAC

Client Sample ID: SD-10
Date Collected: 10/22/20 13:20
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-8
Matrix: Solid
Percent Solids: 61.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.39 g	10.0 mL	427297	10/31/20 07:23	CG	TAL SAC
Total/NA	Analysis	537 (modified)		1			431076	11/12/20 23:36	K1S	TAL SAC
Total/NA	Prep	SHAKE	RE		5.29 g	10.00 mL	433672	11/19/20 15:36	GWO	TAL SAC
Total/NA	Analysis	537 (modified)	RE	1			434398	11/21/20 23:03	D1R	TAL SAC

Client Sample ID: SD-11
Date Collected: 10/22/20 13:10
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-9
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			426968	10/30/20 12:54	KDB	TAL SAC

Client Sample ID: SD-11
Date Collected: 10/22/20 13:10
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-9
Matrix: Solid
Percent Solids: 71.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.34 g	10.0 mL	427297	10/31/20 07:23	CG	TAL SAC
Total/NA	Analysis	537 (modified)		1			431076	11/12/20 23:45	K1S	TAL SAC
Total/NA	Prep	SHAKE	RE		5.42 g	10.00 mL	433672	11/19/20 15:36	GWO	TAL SAC
Total/NA	Analysis	537 (modified)	RE	1			434398	11/21/20 23:13	D1R	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66140-1

Client Sample ID: SD-12
Date Collected: 10/22/20 13:46
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-10
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			426968	10/30/20 12:54	KDB	TAL SAC

Client Sample ID: SD-12
Date Collected: 10/22/20 13:46
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-10
Matrix: Solid
Percent Solids: 57.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.06 g	10.0 mL	427297	10/31/20 07:23	CG	TAL SAC
Total/NA	Analysis	537 (modified)		1			431076	11/12/20 23:55	K1S	TAL SAC
Total/NA	Prep	SHAKE	RE		5.32 g	10.0 mL	431353	11/13/20 08:15	NSS	TAL SAC
Total/NA	Analysis	537 (modified)	RE	1			432941	11/18/20 00:36	S1M	TAL SAC

Client Sample ID: SD-13
Date Collected: 10/22/20 14:05
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-11
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			426968	10/30/20 12:54	KDB	TAL SAC

Client Sample ID: SD-13
Date Collected: 10/22/20 14:05
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66140-11
Matrix: Solid
Percent Solids: 78.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.44 g	10.0 mL	427297	10/31/20 07:23	CG	TAL SAC
Total/NA	Analysis	537 (modified)		1			431076	11/13/20 00:04	K1S	TAL SAC
Total/NA	Prep	SHAKE	RE		5.14 g	10.00 mL	433672	11/19/20 15:36	GWO	TAL SAC
Total/NA	Analysis	537 (modified)	RE	1			434398	11/21/20 23:41	D1R	TAL SAC

Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66140-1

Laboratory: Eurofins TestAmerica, Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	01-20-21
ANAB	Dept. of Defense ELAP	L2468	01-20-21
ANAB	Dept. of Energy	L2468.01	01-20-21
ANAB	ISO/IEC 17025	L2468	01-20-21
Arizona	State	AZ0708	08-11-21
Arkansas DEQ	State	88-0691	06-17-21
California	State	2897	01-31-22
Colorado	State	CA0004	08-31-21
Connecticut	State	PH-0691	06-30-21
Florida	NELAP	E87570	06-30-21
Georgia	State	4040	01-30-21
Hawaii	State	<cert No.>	01-29-21
Illinois	NELAP	200060	03-17-21
Kansas	NELAP	E-10375	10-31-20 *
Louisiana	NELAP	01944	06-30-21
Maine	State	CA00004	04-14-22
Michigan	State	9947	08-03-23
Nevada	State	CA000442021-1	07-31-21
New Hampshire	NELAP	2997	04-18-21
New Jersey	NELAP	CA005	06-30-21
New York	NELAP	11666	04-01-21
Oregon	NELAP	4040	01-29-21
Pennsylvania	NELAP	68-01272	03-31-21
Texas	NELAP	T104704399-19-13	06-01-21
US Fish & Wildlife	US Federal Programs	58448	07-31-21
USDA	US Federal Programs	P330-18-00239	07-31-21
Utah	NELAP	CA000442019-01	02-28-21
Vermont	State	VT-4040	04-16-21
Virginia	NELAP	460278	03-14-21
Washington	State	C581	05-05-21
West Virginia (DW)	State	9930C	12-31-20
Wisconsin	State	998204680	08-31-21
Wyoming	State Program	8TMS-L	01-28-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66140-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
D 2216	Percent Moisture	ASTM	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 TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66140-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
320-66140-1	SD-01	Solid	10/20/20 16:10	10/29/20 10:55	
320-66140-2	SD-02	Solid	10/20/20 16:41	10/29/20 10:55	
320-66140-3	SD-03	Solid	10/20/20 16:31	10/29/20 10:55	
320-66140-4	SD-04	Solid	10/20/20 17:01	10/29/20 10:55	
320-66140-5	SD-06	Solid	10/22/20 11:46	10/29/20 10:55	
320-66140-6	SD-08	Solid	10/22/20 12:26	10/29/20 10:55	
320-66140-7	SD-09	Solid	10/22/20 12:42	10/29/20 10:55	
320-66140-8	SD-10	Solid	10/22/20 13:20	10/29/20 10:55	
320-66140-9	SD-11	Solid	10/22/20 13:10	10/29/20 10:55	
320-66140-10	SD-12	Solid	10/22/20 13:46	10/29/20 10:55	
320-66140-11	SD-13	Solid	10/22/20 14:05	10/29/20 10:55	

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600
www.shannonwilson.com

CHAIN-OF-CUSTODY RECORD

Laboratory Test America
Attn: David Acctucker

Turn Around Time: [X] Normal [ ] Rush — Please Specify

Quote No:

J-Flags: [X] Yes [ ] No

Analytical Methods (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	PFAS x18 (537.1-M)	Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
SD-01		1610	10/20/20	X	1	soil/sediment
SD-02		1641	↓	X	1	↓
SD-03		1631	↓	X	1	↓
SD-04		1701	↓	X	1	↓
SD-06		1146	10/22/20	X	1	↓
SD-08		1226	↓	X	1	↓
SD-09		1242	↓	X	1	↓
SD-10		1320	↓	X	1	↓
SD-11		1310	↓	X	1	↓
SD-12		1346	↓	X	1	↓

320-66140 Chain of Custody

Project Information	
Number:	105745-002
Name:	OME
Contact:	MDN
Ongoing Project?	Yes [X] No [ ]
Sampler:	VTY, APW, MDN

Sample Receipt	
Total No. of Containers:	11
COC Seals/Intact? Y/N/NA	
Received Good Cond./Cold	
Temp:	
Delivery Method:	Goldstreak

Notes:

Reliquished By: 1.	Reliquished By: 2.	Reliquished By: 3.
Signature: By	Signature:	Signature:
Time: 1630	Time:	Time:
Printed Name: Veselina Jakimova	Printed Name:	Printed Name:
Date: 10/26/20	Date:	Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature:	Signature:	Signature:
Time: 1655	Time:	Time:
Printed Name: Jennifer Darlington	Printed Name:	Printed Name:
Date: 26 Oct 20	Date:	Date:
Company: ETAW Sac	Company:	Company:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

2.6°C

No. 35945

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
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Fairbanks, AK 99709
(907) 479-0600
www.shannonwilson.com

CHAIN-OF-CUSTODY RECORD

Laboratory Test America
Attn: David Acctucker

Turn Around Time:	Quote No:
☒ Normal ☐ Rush	J-Flags: ☒ Yes ☐ No
Please Specify	

Analytical Methods (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	PFAS+18 (537.1-M)	Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
SD-13		1405	10/22/20	X	1	soil/sediment

Project Information		Sample Receipt	
Number:	105745	Total No. of Containers:	11
Name:	OME	COC Seals/Intact? Y/N/NA	
Contact:	MDN	Received Good Cond./Cold	
Ongoing Project?	Yes ☒ No ☐	Temp:	
Sampler:	MDN, VTY, APW	Delivery Method:	Goldstreak

Notes:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: BJ Time: 1630	Signature: Time:	Signature: Time:
Printed Name: Veselina Yakimova Date: 10/26/20	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 1655	Signature: Time:	Signature: Time:
Printed Name: Jennifer Jallington Date: 27 Oct 20	Printed Name: Date:	Printed Name: Date:
Company: ETAW SAC	Company:	Company:

2.6°C

No. 35947

Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 320-66140-1

Login Number: 66140
List Number: 1
Creator: Oropeza, Salvador

List Source: Eurofins TestAmerica, Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	Seals
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	ONLY GEL PACKS
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 <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Laboratory Data Review Checklist

Completed By:

Veselina Yakimova

Title:

Geologist

Date:

November 30, 2020

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

Eurofins / TestAmerica Laboratories, Inc.

Laboratory Report Number:

320-66140-1

Laboratory Report Date:

November 23, 2020

CS Site Name:

Nome Airport Statewide PFAS

ADEC File Number:

400.38.056

Hazard Identification Number:

27154

320-66140-1

Laboratory Report Date:

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☒ No☐ N/A☐ Comments:

   The DEC certified TestAmerica of West Sacramento, CA for the analysis of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) on February 6, 2018 by method 537. These compounds were included in the DEC's Contaminated Sites Laboratory Approval 17-020.

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☐ No☐ N/A☒ Comments:

   The requested analyses were conducted by TestAmerica Laboratories in West Sacramento, CA.

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:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☐ No☐ N/A☒ Comments:

   PFAS samples do not require preservation other than temperature control.

   c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

   Yes☒ No☐ N/A☐ Comments:

   The sample receipt form notes that the samples arrived in good condition.

Laboratory Report Date:

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:

No discrepancies were noted by the laboratory in the sample receipt documentation.

e. Data quality or usability affected?

Comments:

The data quality and/or usability was not affected; see above.

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

Laboratory Report Date:

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☒ No☐ N/A☐ Comments:

Perfluorooctanesulfonic acid (PFOS) was detected above the reporting limit (RL) in the method blank associated with preparation batch 320-427297 associated with the following project samples: *SD-01, SD-02, SD-03, SD-04, SD-06, SD-08, SD-09, SD-10, SD-11, SD-12* and *SD-13*.

The laboratory control sample (LCS) for preparation batch 320-427297 recovered outside control limits for PFOS and DONA.

The Isotope Dilution Analyte (IDA) recovery associated with the LCS and method blank for preparatory batch 320-427297 is below the method recommended limit for d3-NMeFOSAA and d5-NEtFOSAA.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries and precision for PFOS in preparation batch 320-427297 were outside control limits. Sample matrix interference are suspected.

The MSD recovery of Perfluoroundecanoic acid (PFUnA) for preparation batch 320-427297 was outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

The IDA recovery of d5-NetFOSAA is above the method recommended limit for the re-extracted sample *SD-08* in preparation batch 320-433672. Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Samples *SD-01*, *SD-02*, *SD-03*, *SD-04*, *SD-08*, *SD-09*, *SD-10*, and *SD-11* were light yellow after extraction.

Samples *SD-06* and *SD-13* were light yellow and cloudy after extraction.

Sample *SD-12* was yellow after extraction.

Samples *SD-01*, *SD-02*, *SD-03*, *SD-04*, *SD-06*, *SD-08*, *SD-09*, *SD-10*, *SD-11*, *SD-12* and *SD-13* from preparation batch 320-431353 were re-prepared outside of preparation holding time due to MB and LCS hit for PFOS.

Samples *SD-06*, *SD-08*, *SD-09*, *SD-10*, *SD-11*, and *SD-13* from preparation batch 320-433672 were re-prepared outside of preparation holding time because the LCS recovery for PFOS was out.

Extracts *SD-06*, *SD-08*, *SD-09*, *SD-10*, *SD-11*, and *SD-13* from preparation batch 320-433672 are yellowish in color.

320-66140-1

Laboratory Report Date:

c. Were all corrective actions documented?

Yes☒ No☐ N/A☐ Comments:

All samples in preparation batch 320-427297 were re-extracted outside of the holding time for the analysis of PFOS, DONA, d3-NMeFOSAA and d5-NEtFOSAA analysis outside of holding time. Both sets of data have been reported.

The laboratory applied the "I" qualifier to the PFHxS result of sample *SD-01* to indicate that the transition mass ratio was outside of the established ratio limits. The qualitative identification of the analytes has some degree of uncertainty and analyst judgment was used to positively identify the analytes. The result has been flagged with a 'J' in the analytical database.

Sample *SD-13* exhibited matrix interferences for PFHxS causing elevation of the reporting limit. The reporting limit has been raised to be equal to the matrix, and the laboratory applied a "G" qualifier flag. The non-detect result has been flagged with a 'UJ' in the analytical database.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

See above. Please see the following sections for our assessment and data qualifiers.

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:

Due to QC failures each project sample was re-extracted and analyzed outside of the holding time for PFOS, DONA, d3-NMeFOSAA and d5-NEtFOSAA.

The original (within hold time) analytical results will be used for reporting for DONA, d3-NMeFOSAA, and d5-NEtFOSAA. The re-extracted out of hold time results will be reported for PFOS due to several QC failures for PFOS in the original batch.

c. All soils reported on a dry weight basis?

Yes☒ No☐ N/A☐ Comments:

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☒ No☐ N/A☐ Comments:

The reporting limit (RL) is less than the applicable DEC regulatory limits for the project, where applicable.

Laboratory Report Date:

e. Data quality or usability affected?

The PFOS results have not been flagged due to the hold time exceedance noted above, as other flags have been applied (see below for further detail), with the following exception. The reported PFOS result (re-extracted batch) for project sample *SD-13* is considered estimated, flagged "J" due to hold time exceedance.

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 limit of quantitation (LOQ) or project specified objectives?

Yes☐ No☒ N/A☐ Comments:

PFOS was detected above the LOQ in the method blank associated with preparation batch 320-4272997.

PFOS was also detected below the LOQ in the method blanks associated with preparation batches 320-431353 and 320-433672.

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

Due to gross contamination in the MB associated with preparatory batch 320-4272997 and multiple other QC failures (described in the following sections), the PFOS results for the original (in holding time) run will not be used for reporting purposes. The re-extracted results for PFOS for each project sample will be used for reporting.

Samples from this work order are affected by the method blank detections listed in 6.a.ii., except for project sample *SD-13* which contained PFOS at a concentration more than ten times that of the concentration detected in the associated method blank. Sample *SD-13* is not considered affected.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

The PFOS results (re-extracted batch) for project samples *SD-01, SD-02, SD-03, SD-04, SD-06, SD-08, SD-09, SD-10, SD-11,* and *SD-12* are considered to be impacted by external contamination and have been flagged 'UB' at the LOQ or detected concentration (whichever is greater) in the analytical tables.

v. Data quality or usability affected?

Comments:

The data quality/usability is affected. See above.

Laboratory Report Date:

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes☒ No☐ N/A☐ Comments:

An LCS was reported for each of the soil preparatory batches. This sample was reported in conjunction with an MS/MSD sample set (see the following section for the assessment of the MS/MSD pair).

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

Metals and/or inorganics were not analyzed as part of this work order.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes☐ No☒ N/A☐ Comments:

The LCS in preparatory batch 320-427297 exceeds the recovery limit for PFOS. The project sample results for this preparatory batch have been rejected due to the MB detection, LCS recovery, and MS/MSD recoveries (discussed below). The re-extracted PFOS results for each sample will be used for reporting purposes, and therefore the results are unaffected by this PFOS LCS recovery failure.

The LCS in preparatory batch 320-427297 exceeds the recovery limit for DONA (low).

The LCS in preparatory batch 320-431353 exceeds recovery limits for PFOS (high).

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. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☐ No☐ N/A☒ Comments:

LCSDs were not reported for the soil batches. Refer to MS/MSD results for assessment of method precision.

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

The original results for DONA will be used for reporting purposes (results were confirmed by the re-extracted results). ADONA was not detected in the project samples. The non-detect values are considered estimated, flagged "UJ" in the analytical tables due to the LCS failure. This flagging applies to project samples *SD-01, SD-02, SD-03, SD-04, SD-06, SD-08, SD-09, SD-10, SD-11, SD-12* and *SD-13*.

PFOS results for project samples *SD-01, SD-02, SD-03, SD-04,* and *SD-12* from preparation batch 320-431353 were affected by the LCS recovery failure (high). A flag has not been applied, as the results have already been flagged due to the method blank detection (see above).

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

Yes; see above.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and/or usability was affected; see above.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☐ No☒ N/A☐ Comments:

An MS/MSD pair was reported for each of the soil preparatory batches.

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

Metals and/or inorganics were not analyzed as part of 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 recovery of PFOS exceeded the control limits in the MS sample associated with preparation batch 320-427297 (original batch). The re-extracted results for PFOS will be used for reporting purposes and the original batch results have been rejected. No further flagging due to this QC failure is required.

The recovery of PFUnA exceeded the control limits in the MSD sample associated with preparation batch 320-427297.

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:

The PFOS RPD exceeded QC limits for preparation batch 320-427297. The re-extracted results for PFOS will be used for reporting purposes and the original batch (320-427297) has been rejected. No further flagging due to this QC failure is required.

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

Project sample *SD-13* was used as the parent sample for the MSD sample for preparation batch 320-427297 and is considered estimated with a high bias, flagged "JH" for PFUnA due to the MSD recovery failure.

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:

The data quality and/or usability was 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 Isotope Dilution Analyte (IDA) recovery associated with the LCS and method blank of preparatory batch 320-427297 is grossly below the method recommended limit for d3-NMeFOSAA and d5-NEtFOSAA. The LCS recoveries for these analytes were within limits and the LCS results are unaffected. The MB results for these analytes are considered affected ("UJ"). These analytes were not detected in the associated project samples and had passing IDA recoveries for the individual project samples. Project sample results are unaffected by the IDA failures in the MB and LCS.

The IDA recovery of d5-NetFOSAA is above the method recommended limit for the re-extracted sample *SD-08* (preparation batch 320-433672). The original project sample results for this analyte will be used for reporting purposes. Therefore, the results are unaffected by this 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:

N/A; see above.

iv. Data quality or usability affected?

Comments:

The data quality and/or usability was not affected by IDA recovery failures; 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. A trip blank is not required for the requested analysis.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes☐ No☐ N/A☒ Comments:

A trip blank is not required for the requested analysis.

iii. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

A trip blank is not required for the requested analysis.

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

NA; a trip blank is not required for the requested analysis.

v. Data quality or usability affected?

Comments:

The data quality and/or usability was not affected; see above.

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☒ No☐ N/A☐ Comments:

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

The field duplicate pairs *SD-02 / SD-03* and *SD-10 / SD-11* were submitted with this work order.

Laboratory Report Date:

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

RPD (%) = 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:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

The data quality and/or usability was not affected; see above.

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☐ N/A☒ Comments:

Reusable equipment was not used for the collection of the associated samples. No equipment blank necessary.

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

See above.

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

N/A see above.

iii. Data quality or usability affected?

Comments:

No; see above.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes☐ No☐ N/A☒ Comments:

KRF

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

Laboratory Job ID: 320-66141-1
Client Project/Site: Nome DOT&PF

For:
Shannon & Wilson, Inc
2355 Hill Rd.
Fairbanks, Alaska 99709-5244

Attn: Marcy Nadel

Authorized for release by:
11/16/2020 12:27:28 PM

David Alltucker, Project Manager I
(916)374-4383
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Table of Contents

Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Qualifiers

LCMS

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
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.
¤	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

Job ID: 320-66141-1

Laboratory: Eurofins TestAmerica, Sacramento

Narrative

Job Narrative
320-66141-1

Receipt
The samples were received on 10/29/2020 10:55 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.6º C.

LCMS
Method 537 (modified): The matrix spike (MS) recoveries for Perfluoroundecanoic acid (PFUnA) of preparation batch 320-427878 and analytical batch 320-431104 were outside control limits. Sample matrix interference is 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 in the Definitions/Glossary page.

Organic Prep
Method SHAKE: The following samples were light yellow and cloudy after extraction: 3-21-SB2-01 (320-66141-3), 3-21-SB3-01 (320-66141-4), 3-21-SB4-01 (320-66141-5) and ARFF-SB1-01 (320-66141-7).

Method SHAKE: The following samples were observed to be yellow after final voluming: 10-28-SB1-01 (320-66141-13), 10-28-SB1-02 (320-66141-14), 10-28-SB2-02 (320-66141-16), 10-28-SB3-01 (320-66141-17), 10-28-SB4-02 (320-66141-18), 10-28-SB6-01 (320-66141-22), (320-66141-A-22 MS) and (320-66141-A-22 MSD).

Method SHAKE: The following samples were observed to be cloudy after final voluming: 10-28-SB1-01 (320-66141-13) and 10-28-SB3-01 (320-66141-17).

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: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 3-21-SB1-01 — Lab Sample ID: 320-66141-1

No Detections.

Client Sample ID: 3-21-SB1-02 — Lab Sample ID: 320-66141-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	0.25	J	0.55	0.22	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: 3-21-SB2-01 — Lab Sample ID: 320-66141-3

No Detections.

Client Sample ID: 3-21-SB3-01 — Lab Sample ID: 320-66141-4

No Detections.

Client Sample ID: 3-21-SB4-01 — Lab Sample ID: 320-66141-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.17	J	0.21	0.045	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.060	J	0.21	0.031	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.12	J	0.21	0.091	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.65		0.21	0.033	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.72		0.53	0.21	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: 3-21-SB4-02 — Lab Sample ID: 320-66141-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.050	J	0.21	0.033	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.54		0.53	0.21	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: ARFF-SB1-01 — Lab Sample ID: 320-66141-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.059	J	0.20	0.042	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.033	J	0.20	0.031	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.24	J	0.50	0.20	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: ARFF-SB1-02 — Lab Sample ID: 320-66141-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.056	J	0.20	0.032	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: ARFF-SB1-03 — Lab Sample ID: 320-66141-9

No Detections.

Client Sample ID: ARFF-SB2-01 — Lab Sample ID: 320-66141-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.45		0.19	0.030	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	3.3		0.48	0.19	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: ARFF-SB2-02 — Lab Sample ID: 320-66141-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.059	J	0.21	0.045	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.048	J	0.21	0.027	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.043	J	0.21	0.033	ug/Kg	1	☼	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: ARFF-SB2-02 (Continued) — Lab Sample ID: 320-66141-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	0.35	J	0.53	0.21	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: ARFF-SB2-03 — Lab Sample ID: 320-66141-12

No Detections.

Client Sample ID: 10-28-SB1-01 — Lab Sample ID: 320-66141-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.041	J	0.21	0.033	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.4		0.53	0.21	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: 10-28-SB1-02 — Lab Sample ID: 320-66141-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.16	J	0.35	0.074	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.34	J	0.35	0.055	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.93		0.88	0.35	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: 10-28-SB2-01 — Lab Sample ID: 320-66141-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.13	J	0.20	0.030	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.31	J	0.49	0.20	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: 10-28-SB2-02 — Lab Sample ID: 320-66141-16

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.032	J	0.20	0.031	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: 10-28-SB3-01 — Lab Sample ID: 320-66141-17

No Detections.

Client Sample ID: 10-28-SB4-02 — Lab Sample ID: 320-66141-18

No Detections.

Client Sample ID: 10-28-SB5-01 — Lab Sample ID: 320-66141-19

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorodecanoic acid (PFDA)	0.035	J	0.21	0.023	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.046	J	0.21	0.033	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.69		0.53	0.21	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: 10-28-SB5-02 — Lab Sample ID: 320-66141-20

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.044	J	0.20	0.032	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.21	J	0.51	0.20	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: 10-28-SB5-12 — Lab Sample ID: 320-66141-21

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.039	J	0.20	0.031	ug/Kg	1	☼	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 10-28-SB6-01 — Lab Sample ID: 320-66141-22

No Detections.

This Detection Summary does not include radiochemical test results.

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 3-21-SB1-01
Date Collected: 10/23/20 19:00
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-1
Matrix: Solid
Percent Solids: 93.7

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.21	0.043	ug/Kg	☼	11/02/20 18:31	11/12/20 03:56	1
Perfluoroheptanoic acid (PFHpA)	ND		0.21	0.030	ug/Kg	☼	11/02/20 18:31	11/12/20 03:56	1
Perfluorooctanoic acid (PFOA)	ND		0.21	0.089	ug/Kg	☼	11/02/20 18:31	11/12/20 03:56	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.037	ug/Kg	☼	11/02/20 18:31	11/12/20 03:56	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.023	ug/Kg	☼	11/02/20 18:31	11/12/20 03:56	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.037	ug/Kg	☼	11/02/20 18:31	11/12/20 03:56	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.069	ug/Kg	☼	11/02/20 18:31	11/12/20 03:56	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.053	ug/Kg	☼	11/02/20 18:31	11/12/20 03:56	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.056	ug/Kg	☼	11/02/20 18:31	11/12/20 03:56	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	11/02/20 18:31	11/12/20 03:56	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.21	0.032	ug/Kg	☼	11/02/20 18:31	11/12/20 03:56	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.52	0.21	ug/Kg	☼	11/02/20 18:31	11/12/20 03:56	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.40	ug/Kg	☼	11/02/20 18:31	11/12/20 03:56	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.38	ug/Kg	☼	11/02/20 18:31	11/12/20 03:56	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.21	0.028	ug/Kg	☼	11/02/20 18:31	11/12/20 03:56	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.26	0.11	ug/Kg	☼	11/02/20 18:31	11/12/20 03:56	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.21	0.023	ug/Kg	☼	11/02/20 18:31	11/12/20 03:56	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.21	0.019	ug/Kg	☼	11/02/20 18:31	11/12/20 03:56	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*90*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:56*	*1*
13C4 PFHpA	*91*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:56*	*1*
13C4 PFOA	*92*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:56*	*1*
13C5 PFNA	*89*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:56*	*1*
13C2 PFDA	*86*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:56*	*1*
13C2 PFUnA	*82*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:56*	*1*
13C2 PFDoA	*72*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:56*	*1*
13C2 PFTeDA	*90*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:56*	*1*
13C3 PFBS	*82*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:56*	*1*
18O2 PFHxS	*79*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:56*	*1*
13C4 PFOS	*81*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:56*	*1*
d3-NMeFOSAA	*104*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:56*	*1*
d5-NEtFOSAA	*91*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:56*	*1*
13C3 HFPO-DA	*82*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:56*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 3-21-SB1-02
Date Collected: 10/23/20 19:15
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-2
Matrix: Solid
Percent Solids: 87.7

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.22	0.047	ug/Kg	☼	11/02/20 18:31	11/12/20 04:05	1
Perfluoroheptanoic acid (PFHpA)	ND		0.22	0.032	ug/Kg	☼	11/02/20 18:31	11/12/20 04:05	1
Perfluorooctanoic acid (PFOA)	ND		0.22	0.095	ug/Kg	☼	11/02/20 18:31	11/12/20 04:05	1
Perfluorononanoic acid (PFNA)	ND		0.22	0.040	ug/Kg	☼	11/02/20 18:31	11/12/20 04:05	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.024	ug/Kg	☼	11/02/20 18:31	11/12/20 04:05	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.040	ug/Kg	☼	11/02/20 18:31	11/12/20 04:05	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.074	ug/Kg	☼	11/02/20 18:31	11/12/20 04:05	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.057	ug/Kg	☼	11/02/20 18:31	11/12/20 04:05	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.060	ug/Kg	☼	11/02/20 18:31	11/12/20 04:05	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.028	ug/Kg	☼	11/02/20 18:31	11/12/20 04:05	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.22	0.034	ug/Kg	☼	11/02/20 18:31	11/12/20 04:05	1
Perfluorooctanesulfonic acid (PFOS)	**0.25**	**J**	0.55	0.22	ug/Kg	☼	11/02/20 18:31	11/12/20 04:05	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.43	ug/Kg	☼	11/02/20 18:31	11/12/20 04:05	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.41	ug/Kg	☼	11/02/20 18:31	11/12/20 04:05	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.22	0.030	ug/Kg	☼	11/02/20 18:31	11/12/20 04:05	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.28	0.12	ug/Kg	☼	11/02/20 18:31	11/12/20 04:05	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.22	0.024	ug/Kg	☼	11/02/20 18:31	11/12/20 04:05	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.22	0.020	ug/Kg	☼	11/02/20 18:31	11/12/20 04:05	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*95*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:05*	*1*
13C4 PFHpA	*96*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:05*	*1*
13C4 PFOA	*96*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:05*	*1*
13C5 PFNA	*86*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:05*	*1*
13C2 PFDA	*82*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:05*	*1*
13C2 PFUnA	*86*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:05*	*1*
13C2 PFDoA	*85*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:05*	*1*
13C2 PFTeDA	*84*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:05*	*1*
13C3 PFBS	*93*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:05*	*1*
18O2 PFHxS	*93*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:05*	*1*
13C4 PFOS	*88*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:05*	*1*
d3-NMeFOSAA	*106*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:05*	*1*
d5-NEtFOSAA	*94*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:05*	*1*
13C3 HFPO-DA	*87*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:05*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 3-21-SB2-01
Date Collected: 10/23/20 21:30
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-3
Matrix: Solid
Percent Solids: 92.4

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.043	ug/Kg	☼	11/02/20 18:31	11/12/20 04:15	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.030	ug/Kg	☼	11/02/20 18:31	11/12/20 04:15	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.088	ug/Kg	☼	11/02/20 18:31	11/12/20 04:15	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.037	ug/Kg	☼	11/02/20 18:31	11/12/20 04:15	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.023	ug/Kg	☼	11/02/20 18:31	11/12/20 04:15	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.037	ug/Kg	☼	11/02/20 18:31	11/12/20 04:15	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.069	ug/Kg	☼	11/02/20 18:31	11/12/20 04:15	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.052	ug/Kg	☼	11/02/20 18:31	11/12/20 04:15	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.055	ug/Kg	☼	11/02/20 18:31	11/12/20 04:15	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.026	ug/Kg	☼	11/02/20 18:31	11/12/20 04:15	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.032	ug/Kg	☼	11/02/20 18:31	11/12/20 04:15	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.51	0.20	ug/Kg	☼	11/02/20 18:31	11/12/20 04:15	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.40	ug/Kg	☼	11/02/20 18:31	11/12/20 04:15	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.38	ug/Kg	☼	11/02/20 18:31	11/12/20 04:15	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.028	ug/Kg	☼	11/02/20 18:31	11/12/20 04:15	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.26	0.11	ug/Kg	☼	11/02/20 18:31	11/12/20 04:15	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.023	ug/Kg	☼	11/02/20 18:31	11/12/20 04:15	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg	☼	11/02/20 18:31	11/12/20 04:15	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*90*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:15*	*1*
13C4 PFHpA	*92*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:15*	*1*
13C4 PFOA	*94*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:15*	*1*
13C5 PFNA	*87*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:15*	*1*
13C2 PFDA	*92*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:15*	*1*
13C2 PFUnA	*82*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:15*	*1*
13C2 PFDoA	*81*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:15*	*1*
13C2 PFTeDA	*75*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:15*	*1*
13C3 PFBS	*86*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:15*	*1*
18O2 PFHxS	*88*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:15*	*1*
13C4 PFOS	*86*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:15*	*1*
d3-NMeFOSAA	*99*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:15*	*1*
d5-NEtFOSAA	*98*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:15*	*1*
13C3 HFPO-DA	*87*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:15*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 3-21-SB3-01
Date Collected: 10/23/20 22:00
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-4
Matrix: Solid
Percent Solids: 92.0

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.042	ug/Kg	☼	11/02/20 18:31	11/12/20 04:24	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.029	ug/Kg	☼	11/02/20 18:31	11/12/20 04:24	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.086	ug/Kg	☼	11/02/20 18:31	11/12/20 04:24	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.036	ug/Kg	☼	11/02/20 18:31	11/12/20 04:24	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg	☼	11/02/20 18:31	11/12/20 04:24	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036	ug/Kg	☼	11/02/20 18:31	11/12/20 04:24	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.067	ug/Kg	☼	11/02/20 18:31	11/12/20 04:24	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051	ug/Kg	☼	11/02/20 18:31	11/12/20 04:24	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054	ug/Kg	☼	11/02/20 18:31	11/12/20 04:24	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg	☼	11/02/20 18:31	11/12/20 04:24	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.031	ug/Kg	☼	11/02/20 18:31	11/12/20 04:24	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.50	0.20	ug/Kg	☼	11/02/20 18:31	11/12/20 04:24	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg	☼	11/02/20 18:31	11/12/20 04:24	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg	☼	11/02/20 18:31	11/12/20 04:24	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.027	ug/Kg	☼	11/02/20 18:31	11/12/20 04:24	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.25	0.11	ug/Kg	☼	11/02/20 18:31	11/12/20 04:24	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.022	ug/Kg	☼	11/02/20 18:31	11/12/20 04:24	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg	☼	11/02/20 18:31	11/12/20 04:24	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*96*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:24*	*1*
13C4 PFHpA	*99*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:24*	*1*
13C4 PFOA	*97*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:24*	*1*
13C5 PFNA	*96*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:24*	*1*
13C2 PFDA	*92*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:24*	*1*
13C2 PFUnA	*100*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:24*	*1*
13C2 PFDoA	*95*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:24*	*1*
13C2 PFTeDA	*89*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:24*	*1*
13C3 PFBS	*91*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:24*	*1*
18O2 PFHxS	*89*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:24*	*1*
13C4 PFOS	*94*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:24*	*1*
d3-NMeFOSAA	*104*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:24*	*1*
d5-NEtFOSAA	*110*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:24*	*1*
13C3 HFPO-DA	*92*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:24*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 3-21-SB4-01
Date Collected: 10/24/20 01:45
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-5
Matrix: Solid
Percent Solids: 93.8

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.17**	**J**	0.21	0.045	ug/Kg	☼	11/02/20 18:31	11/12/20 04:34	1
Perfluoroheptanoic acid (PFHpA)	**0.060**	**J**	0.21	0.031	ug/Kg	☼	11/02/20 18:31	11/12/20 04:34	1
Perfluorooctanoic acid (PFOA)	**0.12**	**J**	0.21	0.091	ug/Kg	☼	11/02/20 18:31	11/12/20 04:34	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.038	ug/Kg	☼	11/02/20 18:31	11/12/20 04:34	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.023	ug/Kg	☼	11/02/20 18:31	11/12/20 04:34	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	11/02/20 18:31	11/12/20 04:34	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.071	ug/Kg	☼	11/02/20 18:31	11/12/20 04:34	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	11/02/20 18:31	11/12/20 04:34	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.057	ug/Kg	☼	11/02/20 18:31	11/12/20 04:34	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	11/02/20 18:31	11/12/20 04:34	1
Perfluorohexanesulfonic acid (PFHxS)	**0.65**		0.21	0.033	ug/Kg	☼	11/02/20 18:31	11/12/20 04:34	1
Perfluorooctanesulfonic acid (PFOS)	**0.72**		0.53	0.21	ug/Kg	☼	11/02/20 18:31	11/12/20 04:34	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	11/02/20 18:31	11/12/20 04:34	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	11/02/20 18:31	11/12/20 04:34	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.21	0.029	ug/Kg	☼	11/02/20 18:31	11/12/20 04:34	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.26	0.12	ug/Kg	☼	11/02/20 18:31	11/12/20 04:34	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.21	0.023	ug/Kg	☼	11/02/20 18:31	11/12/20 04:34	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.21	0.019	ug/Kg	☼	11/02/20 18:31	11/12/20 04:34	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*87*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:34*	*1*
13C4 PFHpA	*89*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:34*	*1*
13C4 PFOA	*91*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:34*	*1*
13C5 PFNA	*75*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:34*	*1*
13C2 PFDA	*88*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:34*	*1*
13C2 PFUnA	*86*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:34*	*1*
13C2 PFDoA	*76*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:34*	*1*
13C2 PFTeDA	*73*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:34*	*1*
13C3 PFBS	*77*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:34*	*1*
18O2 PFHxS	*75*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:34*	*1*
13C4 PFOS	*75*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:34*	*1*
d3-NMeFOSAA	*81*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:34*	*1*
d5-NEtFOSAA	*79*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:34*	*1*
13C3 HFPO-DA	*82*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:34*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 3-21-SB4-02

Date Collected: 10/24/20 01:55
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-6

Matrix: Solid
Percent Solids: 93.7

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.21	0.044	ug/Kg	☼	11/02/20 18:31	11/12/20 04:43	1
Perfluoroheptanoic acid (PFHpA)	ND		0.21	0.031	ug/Kg	☼	11/02/20 18:31	11/12/20 04:43	1
Perfluorooctanoic acid (PFOA)	ND		0.21	0.091	ug/Kg	☼	11/02/20 18:31	11/12/20 04:43	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.038	ug/Kg	☼	11/02/20 18:31	11/12/20 04:43	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.023	ug/Kg	☼	11/02/20 18:31	11/12/20 04:43	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	11/02/20 18:31	11/12/20 04:43	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.071	ug/Kg	☼	11/02/20 18:31	11/12/20 04:43	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	11/02/20 18:31	11/12/20 04:43	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.057	ug/Kg	☼	11/02/20 18:31	11/12/20 04:43	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	11/02/20 18:31	11/12/20 04:43	1
Perfluorohexanesulfonic acid (PFHxS)	**0.050**	**J**	0.21	0.033	ug/Kg	☼	11/02/20 18:31	11/12/20 04:43	1
Perfluorooctanesulfonic acid (PFOS)	**0.54**		0.53	0.21	ug/Kg	☼	11/02/20 18:31	11/12/20 04:43	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	11/02/20 18:31	11/12/20 04:43	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	11/02/20 18:31	11/12/20 04:43	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.21	0.028	ug/Kg	☼	11/02/20 18:31	11/12/20 04:43	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.26	0.12	ug/Kg	☼	11/02/20 18:31	11/12/20 04:43	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.21	0.023	ug/Kg	☼	11/02/20 18:31	11/12/20 04:43	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.21	0.019	ug/Kg	☼	11/02/20 18:31	11/12/20 04:43	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*87*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:43*	*1*
13C4 PFHpA	*88*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:43*	*1*
13C4 PFOA	*90*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:43*	*1*
13C5 PFNA	*83*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:43*	*1*
13C2 PFDA	*90*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:43*	*1*
13C2 PFUnA	*77*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:43*	*1*
13C2 PFDoA	*73*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:43*	*1*
13C2 PFTeDA	*80*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:43*	*1*
13C3 PFBS	*77*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:43*	*1*
18O2 PFHxS	*76*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:43*	*1*
13C4 PFOS	*75*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:43*	*1*
d3-NMeFOSAA	*105*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:43*	*1*
d5-NEtFOSAA	*97*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:43*	*1*
13C3 HFPO-DA	*82*		*25 - 150*	*11/02/20 18:31*	*11/12/20 04:43*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: ARFF-SB1-01

Date Collected: 10/24/20 03:35
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-7

Matrix: Solid
Percent Solids: 93.4

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.059**	**J**	0.20	0.042	ug/Kg	☼	11/02/20 18:31	11/12/20 05:11	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.029	ug/Kg	☼	11/02/20 18:31	11/12/20 05:11	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.086	ug/Kg	☼	11/02/20 18:31	11/12/20 05:11	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.036	ug/Kg	☼	11/02/20 18:31	11/12/20 05:11	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg	☼	11/02/20 18:31	11/12/20 05:11	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036	ug/Kg	☼	11/02/20 18:31	11/12/20 05:11	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.067	ug/Kg	☼	11/02/20 18:31	11/12/20 05:11	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051	ug/Kg	☼	11/02/20 18:31	11/12/20 05:11	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054	ug/Kg	☼	11/02/20 18:31	11/12/20 05:11	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg	☼	11/02/20 18:31	11/12/20 05:11	1
Perfluorohexanesulfonic acid (PFHxS)	**0.033**	**J**	0.20	0.031	ug/Kg	☼	11/02/20 18:31	11/12/20 05:11	1
Perfluorooctanesulfonic acid (PFOS)	**0.24**	**J**	0.50	0.20	ug/Kg	☼	11/02/20 18:31	11/12/20 05:11	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg	☼	11/02/20 18:31	11/12/20 05:11	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg	☼	11/02/20 18:31	11/12/20 05:11	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.027	ug/Kg	☼	11/02/20 18:31	11/12/20 05:11	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.25	0.11	ug/Kg	☼	11/02/20 18:31	11/12/20 05:11	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.022	ug/Kg	☼	11/02/20 18:31	11/12/20 05:11	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg	☼	11/02/20 18:31	11/12/20 05:11	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*87*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:11*	*1*
13C4 PFHpA	*91*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:11*	*1*
13C4 PFOA	*89*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:11*	*1*
13C5 PFNA	*87*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:11*	*1*
13C2 PFDA	*83*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:11*	*1*
13C2 PFUnA	*88*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:11*	*1*
13C2 PFDoA	*83*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:11*	*1*
13C2 PFTeDA	*80*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:11*	*1*
13C3 PFBS	*77*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:11*	*1*
18O2 PFHxS	*73*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:11*	*1*
13C4 PFOS	*76*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:11*	*1*
d3-NMeFOSAA	*113*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:11*	*1*
d5-NEtFOSAA	*103*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:11*	*1*
13C3 HFPO-DA	*83*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:11*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: ARFF-SB1-02

Date Collected: 10/24/20 03:45
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-8

Matrix: Solid
Percent Solids: 89.6

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.043	ug/Kg	☼	11/02/20 18:31	11/12/20 05:21	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.030	ug/Kg	☼	11/02/20 18:31	11/12/20 05:21	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.088	ug/Kg	☼	11/02/20 18:31	11/12/20 05:21	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.037	ug/Kg	☼	11/02/20 18:31	11/12/20 05:21	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg	☼	11/02/20 18:31	11/12/20 05:21	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.037	ug/Kg	☼	11/02/20 18:31	11/12/20 05:21	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.068	ug/Kg	☼	11/02/20 18:31	11/12/20 05:21	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.052	ug/Kg	☼	11/02/20 18:31	11/12/20 05:21	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.055	ug/Kg	☼	11/02/20 18:31	11/12/20 05:21	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.026	ug/Kg	☼	11/02/20 18:31	11/12/20 05:21	1
Perfluorohexanesulfonic acid (PFHxS)	**0.056**	**J**	0.20	0.032	ug/Kg	☼	11/02/20 18:31	11/12/20 05:21	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.51	0.20	ug/Kg	☼	11/02/20 18:31	11/12/20 05:21	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.40	ug/Kg	☼	11/02/20 18:31	11/12/20 05:21	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.38	ug/Kg	☼	11/02/20 18:31	11/12/20 05:21	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.028	ug/Kg	☼	11/02/20 18:31	11/12/20 05:21	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.26	0.11	ug/Kg	☼	11/02/20 18:31	11/12/20 05:21	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.022	ug/Kg	☼	11/02/20 18:31	11/12/20 05:21	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg	☼	11/02/20 18:31	11/12/20 05:21	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*89*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:21*	*1*
13C4 PFHpA	*90*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:21*	*1*
13C4 PFOA	*91*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:21*	*1*
13C5 PFNA	*80*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:21*	*1*
13C2 PFDA	*82*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:21*	*1*
13C2 PFUnA	*87*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:21*	*1*
13C2 PFDoA	*78*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:21*	*1*
13C2 PFTeDA	*80*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:21*	*1*
13C3 PFBS	*84*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:21*	*1*
18O2 PFHxS	*83*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:21*	*1*
13C4 PFOS	*82*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:21*	*1*
d3-NMeFOSAA	*99*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:21*	*1*
d5-NEtFOSAA	*100*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:21*	*1*
13C3 HFPO-DA	*85*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:21*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: ARFF-SB1-03
Date Collected: 10/24/20 04:00
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-9
Matrix: Solid
Percent Solids: 88.3

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.21	0.044	ug/Kg	☼	11/02/20 18:31	11/12/20 05:30	1
Perfluoroheptanoic acid (PFHpA)	ND		0.21	0.031	ug/Kg	☼	11/02/20 18:31	11/12/20 05:30	1
Perfluorooctanoic acid (PFOA)	ND		0.21	0.091	ug/Kg	☼	11/02/20 18:31	11/12/20 05:30	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.038	ug/Kg	☼	11/02/20 18:31	11/12/20 05:30	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.023	ug/Kg	☼	11/02/20 18:31	11/12/20 05:30	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	11/02/20 18:31	11/12/20 05:30	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.071	ug/Kg	☼	11/02/20 18:31	11/12/20 05:30	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	11/02/20 18:31	11/12/20 05:30	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.057	ug/Kg	☼	11/02/20 18:31	11/12/20 05:30	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	11/02/20 18:31	11/12/20 05:30	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.21	0.033	ug/Kg	☼	11/02/20 18:31	11/12/20 05:30	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.53	0.21	ug/Kg	☼	11/02/20 18:31	11/12/20 05:30	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	11/02/20 18:31	11/12/20 05:30	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	11/02/20 18:31	11/12/20 05:30	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.21	0.028	ug/Kg	☼	11/02/20 18:31	11/12/20 05:30	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.26	0.12	ug/Kg	☼	11/02/20 18:31	11/12/20 05:30	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.21	0.023	ug/Kg	☼	11/02/20 18:31	11/12/20 05:30	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.21	0.019	ug/Kg	☼	11/02/20 18:31	11/12/20 05:30	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*92*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:30*	*1*
13C4 PFHpA	*97*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:30*	*1*
13C4 PFOA	*96*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:30*	*1*
13C5 PFNA	*93*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:30*	*1*
13C2 PFDA	*87*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:30*	*1*
13C2 PFUnA	*93*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:30*	*1*
13C2 PFDoA	*85*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:30*	*1*
13C2 PFTeDA	*80*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:30*	*1*
13C3 PFBS	*92*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:30*	*1*
18O2 PFHxS	*92*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:30*	*1*
13C4 PFOS	*94*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:30*	*1*
d3-NMeFOSAA	*102*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:30*	*1*
d5-NEtFOSAA	*109*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:30*	*1*
13C3 HFPO-DA	*91*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:30*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: ARFF-SB2-01
Date Collected: 10/24/20 04:30
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-10
Matrix: Solid
Percent Solids: 96.5

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.19	0.040	ug/Kg	☼	11/02/20 18:31	11/12/20 05:39	1
Perfluoroheptanoic acid (PFHpA)	ND		0.19	0.028	ug/Kg	☼	11/02/20 18:31	11/12/20 05:39	1
Perfluorooctanoic acid (PFOA)	ND		0.19	0.082	ug/Kg	☼	11/02/20 18:31	11/12/20 05:39	1
Perfluorononanoic acid (PFNA)	ND		0.19	0.034	ug/Kg	☼	11/02/20 18:31	11/12/20 05:39	1
Perfluorodecanoic acid (PFDA)	ND		0.19	0.021	ug/Kg	☼	11/02/20 18:31	11/12/20 05:39	1
Perfluoroundecanoic acid (PFUnA)	ND		0.19	0.034	ug/Kg	☼	11/02/20 18:31	11/12/20 05:39	1
Perfluorododecanoic acid (PFDoA)	ND		0.19	0.064	ug/Kg	☼	11/02/20 18:31	11/12/20 05:39	1
Perfluorotridecanoic acid (PFTriA)	ND		0.19	0.049	ug/Kg	☼	11/02/20 18:31	11/12/20 05:39	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.19	0.052	ug/Kg	☼	11/02/20 18:31	11/12/20 05:39	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.19	0.024	ug/Kg	☼	11/02/20 18:31	11/12/20 05:39	1
Perfluorohexanesulfonic acid (PFHxS)	**0.45**		0.19	0.030	ug/Kg	☼	11/02/20 18:31	11/12/20 05:39	1
Perfluorooctanesulfonic acid (PFOS)	**3.3**		0.48	0.19	ug/Kg	☼	11/02/20 18:31	11/12/20 05:39	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		1.9	0.37	ug/Kg	☼	11/02/20 18:31	11/12/20 05:39	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		1.9	0.35	ug/Kg	☼	11/02/20 18:31	11/12/20 05:39	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.19	0.026	ug/Kg	☼	11/02/20 18:31	11/12/20 05:39	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.24	0.11	ug/Kg	☼	11/02/20 18:31	11/12/20 05:39	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.19	0.021	ug/Kg	☼	11/02/20 18:31	11/12/20 05:39	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.19	0.017	ug/Kg	☼	11/02/20 18:31	11/12/20 05:39	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*86*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:39*	*1*
13C4 PFHpA	*89*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:39*	*1*
13C4 PFOA	*90*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:39*	*1*
13C5 PFNA	*82*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:39*	*1*
13C2 PFDA	*84*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:39*	*1*
13C2 PFUnA	*86*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:39*	*1*
13C2 PFDoA	*84*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:39*	*1*
13C2 PFTeDA	*83*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:39*	*1*
13C3 PFBS	*78*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:39*	*1*
18O2 PFHxS	*80*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:39*	*1*
13C4 PFOS	*76*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:39*	*1*
d3-NMeFOSAA	*93*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:39*	*1*
d5-NEtFOSAA	*94*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:39*	*1*
13C3 HFPO-DA	*87*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:39*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: ARFF-SB2-02

Date Collected: 10/24/20 04:45
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-11

Matrix: Solid
Percent Solids: 88.4

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.059**	**J**	0.21	0.045	ug/Kg	☼	11/02/20 18:31	11/12/20 05:49	1
Perfluoroheptanoic acid (PFHpA)	ND		0.21	0.031	ug/Kg	☼	11/02/20 18:31	11/12/20 05:49	1
Perfluorooctanoic acid (PFOA)	ND		0.21	0.091	ug/Kg	☼	11/02/20 18:31	11/12/20 05:49	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.038	ug/Kg	☼	11/02/20 18:31	11/12/20 05:49	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.023	ug/Kg	☼	11/02/20 18:31	11/12/20 05:49	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	11/02/20 18:31	11/12/20 05:49	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.071	ug/Kg	☼	11/02/20 18:31	11/12/20 05:49	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	11/02/20 18:31	11/12/20 05:49	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.057	ug/Kg	☼	11/02/20 18:31	11/12/20 05:49	1
Perfluorobutanesulfonic acid (PFBS)	**0.048**	**J**	0.21	0.027	ug/Kg	☼	11/02/20 18:31	11/12/20 05:49	1
Perfluorohexanesulfonic acid (PFHxS)	**0.043**	**J**	0.21	0.033	ug/Kg	☼	11/02/20 18:31	11/12/20 05:49	1
Perfluorooctanesulfonic acid (PFOS)	**0.35**	**J**	0.53	0.21	ug/Kg	☼	11/02/20 18:31	11/12/20 05:49	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	11/02/20 18:31	11/12/20 05:49	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	11/02/20 18:31	11/12/20 05:49	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.21	0.029	ug/Kg	☼	11/02/20 18:31	11/12/20 05:49	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.27	0.12	ug/Kg	☼	11/02/20 18:31	11/12/20 05:49	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.21	0.023	ug/Kg	☼	11/02/20 18:31	11/12/20 05:49	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.21	0.019	ug/Kg	☼	11/02/20 18:31	11/12/20 05:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*88*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:49*	*1*
13C4 PFHpA	*89*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:49*	*1*
13C4 PFOA	*89*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:49*	*1*
13C5 PFNA	*85*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:49*	*1*
13C2 PFDA	*81*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:49*	*1*
13C2 PFUnA	*92*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:49*	*1*
13C2 PFDoA	*72*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:49*	*1*
13C2 PFTeDA	*72*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:49*	*1*
13C3 PFBS	*88*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:49*	*1*
18O2 PFHxS	*84*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:49*	*1*
13C4 PFOS	*84*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:49*	*1*
d3-NMeFOSAA	*109*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:49*	*1*
d5-NEtFOSAA	*104*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:49*	*1*
13C3 HFPO-DA	*84*		*25 - 150*	*11/02/20 18:31*	*11/12/20 05:49*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: ARFF-SB2-03
Date Collected: 10/24/20 04:55
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-12
Matrix: Solid
Percent Solids: 81.6

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.23	0.049	ug/Kg	☼	11/02/20 18:50	11/13/20 02:25	1
Perfluoroheptanoic acid (PFHpA)	ND		0.23	0.034	ug/Kg	☼	11/02/20 18:50	11/13/20 02:25	1
Perfluorooctanoic acid (PFOA)	ND		0.23	0.10	ug/Kg	☼	11/02/20 18:50	11/13/20 02:25	1
Perfluorononanoic acid (PFNA)	ND		0.23	0.042	ug/Kg	☼	11/02/20 18:50	11/13/20 02:25	1
Perfluorodecanoic acid (PFDA)	ND		0.23	0.026	ug/Kg	☼	11/02/20 18:50	11/13/20 02:25	1
Perfluoroundecanoic acid (PFUnA)	ND		0.23	0.042	ug/Kg	☼	11/02/20 18:50	11/13/20 02:25	1
Perfluorododecanoic acid (PFDoA)	ND		0.23	0.078	ug/Kg	☼	11/02/20 18:50	11/13/20 02:25	1
Perfluorotridecanoic acid (PFTriA)	ND		0.23	0.059	ug/Kg	☼	11/02/20 18:50	11/13/20 02:25	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.23	0.063	ug/Kg	☼	11/02/20 18:50	11/13/20 02:25	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.23	0.029	ug/Kg	☼	11/02/20 18:50	11/13/20 02:25	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.23	0.036	ug/Kg	☼	11/02/20 18:50	11/13/20 02:25	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.58	0.23	ug/Kg	☼	11/02/20 18:50	11/13/20 02:25	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.3	0.45	ug/Kg	☼	11/02/20 18:50	11/13/20 02:25	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.3	0.43	ug/Kg	☼	11/02/20 18:50	11/13/20 02:25	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.23	0.031	ug/Kg	☼	11/02/20 18:50	11/13/20 02:25	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.29	0.13	ug/Kg	☼	11/02/20 18:50	11/13/20 02:25	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.23	0.026	ug/Kg	☼	11/02/20 18:50	11/13/20 02:25	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.23	0.021	ug/Kg	☼	11/02/20 18:50	11/13/20 02:25	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*80*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:25*	*1*
13C4 PFHpA	*78*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:25*	*1*
13C4 PFOA	*79*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:25*	*1*
13C5 PFNA	*71*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:25*	*1*
13C2 PFDA	*79*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:25*	*1*
13C2 PFUnA	*75*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:25*	*1*
13C2 PFDoA	*69*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:25*	*1*
13C2 PFTeDA	*66*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:25*	*1*
13C3 PFBS	*77*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:25*	*1*
18O2 PFHxS	*77*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:25*	*1*
13C4 PFOS	*73*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:25*	*1*
d3-NMeFOSAA	*92*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:25*	*1*
d5-NEtFOSAA	*87*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:25*	*1*
13C3 HFPO-DA	*73*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:25*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 10-28-SB1-01
Date Collected: 10/24/20 23:10
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-13
Matrix: Solid
Percent Solids: 92.4

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.21	0.044	ug/Kg	☼	11/02/20 18:50	11/13/20 02:35	1
Perfluoroheptanoic acid (PFHpA)	ND		0.21	0.031	ug/Kg	☼	11/02/20 18:50	11/13/20 02:35	1
Perfluorooctanoic acid (PFOA)	ND		0.21	0.091	ug/Kg	☼	11/02/20 18:50	11/13/20 02:35	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.038	ug/Kg	☼	11/02/20 18:50	11/13/20 02:35	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.023	ug/Kg	☼	11/02/20 18:50	11/13/20 02:35	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	11/02/20 18:50	11/13/20 02:35	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.071	ug/Kg	☼	11/02/20 18:50	11/13/20 02:35	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	11/02/20 18:50	11/13/20 02:35	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.057	ug/Kg	☼	11/02/20 18:50	11/13/20 02:35	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	11/02/20 18:50	11/13/20 02:35	1
Perfluorohexanesulfonic acid (PFHxS)	**0.041**	**J**	0.21	0.033	ug/Kg	☼	11/02/20 18:50	11/13/20 02:35	1
Perfluorooctanesulfonic acid (PFOS)	**1.4**		0.53	0.21	ug/Kg	☼	11/02/20 18:50	11/13/20 02:35	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	11/02/20 18:50	11/13/20 02:35	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	11/02/20 18:50	11/13/20 02:35	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.21	0.028	ug/Kg	☼	11/02/20 18:50	11/13/20 02:35	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.26	0.12	ug/Kg	☼	11/02/20 18:50	11/13/20 02:35	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.21	0.023	ug/Kg	☼	11/02/20 18:50	11/13/20 02:35	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.21	0.019	ug/Kg	☼	11/02/20 18:50	11/13/20 02:35	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*87*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:35*	*1*
13C4 PFHpA	*87*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:35*	*1*
13C4 PFOA	*83*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:35*	*1*
13C5 PFNA	*76*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:35*	*1*
13C2 PFDA	*76*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:35*	*1*
13C2 PFUnA	*77*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:35*	*1*
13C2 PFDoA	*67*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:35*	*1*
13C2 PFTeDA	*50*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:35*	*1*
13C3 PFBS	*84*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:35*	*1*
18O2 PFHxS	*77*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:35*	*1*
13C4 PFOS	*76*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:35*	*1*
d3-NMeFOSAA	*77*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:35*	*1*
d5-NEtFOSAA	*76*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:35*	*1*
13C3 HFPO-DA	*81*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:35*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 10-28-SB1-02
Date Collected: 10/24/20 23:30
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-14
Matrix: Solid
Percent Solids: 55.0

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.16**	**J**	0.35	0.074	ug/Kg	☼	11/02/20 18:50	11/13/20 02:44	1
Perfluoroheptanoic acid (PFHpA)	ND		0.35	0.051	ug/Kg	☼	11/02/20 18:50	11/13/20 02:44	1
Perfluorooctanoic acid (PFOA)	ND		0.35	0.15	ug/Kg	☼	11/02/20 18:50	11/13/20 02:44	1
Perfluorononanoic acid (PFNA)	ND		0.35	0.064	ug/Kg	☼	11/02/20 18:50	11/13/20 02:44	1
Perfluorodecanoic acid (PFDA)	ND		0.35	0.039	ug/Kg	☼	11/02/20 18:50	11/13/20 02:44	1
Perfluoroundecanoic acid (PFUnA)	ND		0.35	0.064	ug/Kg	☼	11/02/20 18:50	11/13/20 02:44	1
Perfluorododecanoic acid (PFDoA)	ND		0.35	0.12	ug/Kg	☼	11/02/20 18:50	11/13/20 02:44	1
Perfluorotridecanoic acid (PFTriA)	ND		0.35	0.090	ug/Kg	☼	11/02/20 18:50	11/13/20 02:44	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.35	0.095	ug/Kg	☼	11/02/20 18:50	11/13/20 02:44	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.35	0.044	ug/Kg	☼	11/02/20 18:50	11/13/20 02:44	1
Perfluorohexanesulfonic acid (PFHxS)	**0.34**	**J**	0.35	0.055	ug/Kg	☼	11/02/20 18:50	11/13/20 02:44	1
Perfluorooctanesulfonic acid (PFOS)	**0.93**		0.88	0.35	ug/Kg	☼	11/02/20 18:50	11/13/20 02:44	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		3.5	0.69	ug/Kg	☼	11/02/20 18:50	11/13/20 02:44	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		3.5	0.65	ug/Kg	☼	11/02/20 18:50	11/13/20 02:44	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.35	0.048	ug/Kg	☼	11/02/20 18:50	11/13/20 02:44	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.44	0.19	ug/Kg	☼	11/02/20 18:50	11/13/20 02:44	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.35	0.039	ug/Kg	☼	11/02/20 18:50	11/13/20 02:44	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.35	0.032	ug/Kg	☼	11/02/20 18:50	11/13/20 02:44	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*64*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:44*	*1*
13C4 PFHpA	*73*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:44*	*1*
13C4 PFOA	*79*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:44*	*1*
13C5 PFNA	*70*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:44*	*1*
13C2 PFDA	*74*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:44*	*1*
13C2 PFUnA	*77*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:44*	*1*
13C2 PFDoA	*69*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:44*	*1*
13C2 PFTeDA	*56*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:44*	*1*
13C3 PFBS	*54*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:44*	*1*
18O2 PFHxS	*81*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:44*	*1*
13C4 PFOS	*81*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:44*	*1*
d3-NMeFOSAA	*69*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:44*	*1*
d5-NEtFOSAA	*70*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:44*	*1*
13C3 HFPO-DA	*57*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:44*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 10-28-SB2-01
Date Collected: 10/25/20 00:45
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-15
Matrix: Solid
Percent Solids: 94.2

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.041	ug/Kg	☼	11/02/20 18:50	11/13/20 02:53	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.028	ug/Kg	☼	11/02/20 18:50	11/13/20 02:53	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.084	ug/Kg	☼	11/02/20 18:50	11/13/20 02:53	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.035	ug/Kg	☼	11/02/20 18:50	11/13/20 02:53	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg	☼	11/02/20 18:50	11/13/20 02:53	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.035	ug/Kg	☼	11/02/20 18:50	11/13/20 02:53	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.066	ug/Kg	☼	11/02/20 18:50	11/13/20 02:53	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.050	ug/Kg	☼	11/02/20 18:50	11/13/20 02:53	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.053	ug/Kg	☼	11/02/20 18:50	11/13/20 02:53	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.024	ug/Kg	☼	11/02/20 18:50	11/13/20 02:53	1
Perfluorohexanesulfonic acid (PFHxS)	**0.13**	**J**	0.20	0.030	ug/Kg	☼	11/02/20 18:50	11/13/20 02:53	1
Perfluorooctanesulfonic acid (PFOS)	**0.31**	**J**	0.49	0.20	ug/Kg	☼	11/02/20 18:50	11/13/20 02:53	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.38	ug/Kg	☼	11/02/20 18:50	11/13/20 02:53	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.36	ug/Kg	☼	11/02/20 18:50	11/13/20 02:53	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.026	ug/Kg	☼	11/02/20 18:50	11/13/20 02:53	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.24	0.11	ug/Kg	☼	11/02/20 18:50	11/13/20 02:53	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.022	ug/Kg	☼	11/02/20 18:50	11/13/20 02:53	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg	☼	11/02/20 18:50	11/13/20 02:53	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*87*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:53*	*1*
13C4 PFHpA	*89*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:53*	*1*
13C4 PFOA	*88*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:53*	*1*
13C5 PFNA	*84*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:53*	*1*
13C2 PFDA	*79*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:53*	*1*
13C2 PFUnA	*76*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:53*	*1*
13C2 PFDoA	*69*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:53*	*1*
13C2 PFTeDA	*71*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:53*	*1*
13C3 PFBS	*83*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:53*	*1*
18O2 PFHxS	*86*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:53*	*1*
13C4 PFOS	*85*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:53*	*1*
d3-NMeFOSAA	*87*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:53*	*1*
d5-NEtFOSAA	*84*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:53*	*1*
13C3 HFPO-DA	*84*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:53*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 10-28-SB2-02
Date Collected: 10/25/20 00:55
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-16
Matrix: Solid
Percent Solids: 92.6

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.042	ug/Kg	☼	11/02/20 18:50	11/13/20 03:03	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.029	ug/Kg	☼	11/02/20 18:50	11/13/20 03:03	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.085	ug/Kg	☼	11/02/20 18:50	11/13/20 03:03	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.036	ug/Kg	☼	11/02/20 18:50	11/13/20 03:03	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg	☼	11/02/20 18:50	11/13/20 03:03	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036	ug/Kg	☼	11/02/20 18:50	11/13/20 03:03	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.066	ug/Kg	☼	11/02/20 18:50	11/13/20 03:03	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.050	ug/Kg	☼	11/02/20 18:50	11/13/20 03:03	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.053	ug/Kg	☼	11/02/20 18:50	11/13/20 03:03	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg	☼	11/02/20 18:50	11/13/20 03:03	1
Perfluorohexanesulfonic acid (PFHxS)	**0.032**	**J**	0.20	0.031	ug/Kg	☼	11/02/20 18:50	11/13/20 03:03	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.49	0.20	ug/Kg	☼	11/02/20 18:50	11/13/20 03:03	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg	☼	11/02/20 18:50	11/13/20 03:03	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg	☼	11/02/20 18:50	11/13/20 03:03	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.027	ug/Kg	☼	11/02/20 18:50	11/13/20 03:03	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.25	0.11	ug/Kg	☼	11/02/20 18:50	11/13/20 03:03	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.022	ug/Kg	☼	11/02/20 18:50	11/13/20 03:03	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg	☼	11/02/20 18:50	11/13/20 03:03	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*100*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:03*	*1*
13C4 PFHpA	*97*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:03*	*1*
13C4 PFOA	*95*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:03*	*1*
13C5 PFNA	*93*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:03*	*1*
13C2 PFDA	*101*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:03*	*1*
13C2 PFUnA	*87*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:03*	*1*
13C2 PFDoA	*86*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:03*	*1*
13C2 PFTeDA	*70*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:03*	*1*
13C3 PFBS	*88*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:03*	*1*
18O2 PFHxS	*91*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:03*	*1*
13C4 PFOS	*91*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:03*	*1*
d3-NMeFOSAA	*108*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:03*	*1*
d5-NEtFOSAA	*106*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:03*	*1*
13C3 HFPO-DA	*90*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:03*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 10-28-SB3-01
Date Collected: 10/25/20 01:20
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-17
Matrix: Solid
Percent Solids: 94.9

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.19	0.041	ug/Kg	☼	11/02/20 18:50	11/13/20 03:12	1
Perfluoroheptanoic acid (PFHpA)	ND		0.19	0.028	ug/Kg	☼	11/02/20 18:50	11/13/20 03:12	1
Perfluorooctanoic acid (PFOA)	ND		0.19	0.084	ug/Kg	☼	11/02/20 18:50	11/13/20 03:12	1
Perfluorononanoic acid (PFNA)	ND		0.19	0.035	ug/Kg	☼	11/02/20 18:50	11/13/20 03:12	1
Perfluorodecanoic acid (PFDA)	ND		0.19	0.021	ug/Kg	☼	11/02/20 18:50	11/13/20 03:12	1
Perfluoroundecanoic acid (PFUnA)	ND		0.19	0.035	ug/Kg	☼	11/02/20 18:50	11/13/20 03:12	1
Perfluorododecanoic acid (PFDoA)	ND		0.19	0.065	ug/Kg	☼	11/02/20 18:50	11/13/20 03:12	1
Perfluorotridecanoic acid (PFTriA)	ND		0.19	0.050	ug/Kg	☼	11/02/20 18:50	11/13/20 03:12	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.19	0.053	ug/Kg	☼	11/02/20 18:50	11/13/20 03:12	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.19	0.024	ug/Kg	☼	11/02/20 18:50	11/13/20 03:12	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.19	0.030	ug/Kg	☼	11/02/20 18:50	11/13/20 03:12	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.49	0.19	ug/Kg	☼	11/02/20 18:50	11/13/20 03:12	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		1.9	0.38	ug/Kg	☼	11/02/20 18:50	11/13/20 03:12	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		1.9	0.36	ug/Kg	☼	11/02/20 18:50	11/13/20 03:12	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.19	0.026	ug/Kg	☼	11/02/20 18:50	11/13/20 03:12	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.24	0.11	ug/Kg	☼	11/02/20 18:50	11/13/20 03:12	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.19	0.021	ug/Kg	☼	11/02/20 18:50	11/13/20 03:12	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.19	0.018	ug/Kg	☼	11/02/20 18:50	11/13/20 03:12	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*94*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:12*	*1*
13C4 PFHpA	*98*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:12*	*1*
13C4 PFOA	*98*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:12*	*1*
13C5 PFNA	*96*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:12*	*1*
13C2 PFDA	*91*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:12*	*1*
13C2 PFUnA	*84*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:12*	*1*
13C2 PFDoA	*90*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:12*	*1*
13C2 PFTeDA	*82*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:12*	*1*
13C3 PFBS	*89*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:12*	*1*
18O2 PFHxS	*86*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:12*	*1*
13C4 PFOS	*85*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:12*	*1*
d3-NMeFOSAA	*100*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:12*	*1*
d5-NEtFOSAA	*110*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:12*	*1*
13C3 HFPO-DA	*91*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:12*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 10-28-SB4-02
Date Collected: 10/25/20 03:10
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-18
Matrix: Solid
Percent Solids: 48.8

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.38	0.079	ug/Kg	☼	11/02/20 18:50	11/13/20 03:40	1
Perfluoroheptanoic acid (PFHpA)	ND		0.38	0.055	ug/Kg	☼	11/02/20 18:50	11/13/20 03:40	1
Perfluorooctanoic acid (PFOA)	ND		0.38	0.16	ug/Kg	☼	11/02/20 18:50	11/13/20 03:40	1
Perfluorononanoic acid (PFNA)	ND		0.38	0.068	ug/Kg	☼	11/02/20 18:50	11/13/20 03:40	1
Perfluorodecanoic acid (PFDA)	ND		0.38	0.042	ug/Kg	☼	11/02/20 18:50	11/13/20 03:40	1
Perfluoroundecanoic acid (PFUnA)	ND		0.38	0.068	ug/Kg	☼	11/02/20 18:50	11/13/20 03:40	1
Perfluorododecanoic acid (PFDoA)	ND		0.38	0.13	ug/Kg	☼	11/02/20 18:50	11/13/20 03:40	1
Perfluorotridecanoic acid (PFTriA)	ND		0.38	0.096	ug/Kg	☼	11/02/20 18:50	11/13/20 03:40	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.38	0.10	ug/Kg	☼	11/02/20 18:50	11/13/20 03:40	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.38	0.047	ug/Kg	☼	11/02/20 18:50	11/13/20 03:40	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.38	0.059	ug/Kg	☼	11/02/20 18:50	11/13/20 03:40	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.94	0.38	ug/Kg	☼	11/02/20 18:50	11/13/20 03:40	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		3.8	0.74	ug/Kg	☼	11/02/20 18:50	11/13/20 03:40	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		3.8	0.70	ug/Kg	☼	11/02/20 18:50	11/13/20 03:40	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.38	0.051	ug/Kg	☼	11/02/20 18:50	11/13/20 03:40	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.47	0.21	ug/Kg	☼	11/02/20 18:50	11/13/20 03:40	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.38	0.042	ug/Kg	☼	11/02/20 18:50	11/13/20 03:40	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.38	0.034	ug/Kg	☼	11/02/20 18:50	11/13/20 03:40	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*85*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:40*	*1*
13C4 PFHpA	*87*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:40*	*1*
13C4 PFOA	*94*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:40*	*1*
13C5 PFNA	*91*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:40*	*1*
13C2 PFDA	*93*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:40*	*1*
13C2 PFUnA	*80*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:40*	*1*
13C2 PFDoA	*69*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:40*	*1*
13C2 PFTeDA	*50*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:40*	*1*
13C3 PFBS	*77*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:40*	*1*
18O2 PFHxS	*94*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:40*	*1*
13C4 PFOS	*96*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:40*	*1*
d3-NMeFOSAA	*79*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:40*	*1*
d5-NEtFOSAA	*79*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:40*	*1*
13C3 HFPO-DA	*77*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:40*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 10-28-SB5-01

Date Collected: 10/25/20 04:40
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-19

Matrix: Solid
Percent Solids: 92.5

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.21	0.044	ug/Kg	☼	11/02/20 18:50	11/13/20 03:50	1
Perfluoroheptanoic acid (PFHpA)	ND		0.21	0.031	ug/Kg	☼	11/02/20 18:50	11/13/20 03:50	1
Perfluorooctanoic acid (PFOA)	ND		0.21	0.091	ug/Kg	☼	11/02/20 18:50	11/13/20 03:50	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.038	ug/Kg	☼	11/02/20 18:50	11/13/20 03:50	1
Perfluorodecanoic acid (PFDA)	**0.035**	**J**	0.21	0.023	ug/Kg	☼	11/02/20 18:50	11/13/20 03:50	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	11/02/20 18:50	11/13/20 03:50	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.071	ug/Kg	☼	11/02/20 18:50	11/13/20 03:50	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	11/02/20 18:50	11/13/20 03:50	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.057	ug/Kg	☼	11/02/20 18:50	11/13/20 03:50	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	11/02/20 18:50	11/13/20 03:50	1
Perfluorohexanesulfonic acid (PFHxS)	**0.046**	**J**	0.21	0.033	ug/Kg	☼	11/02/20 18:50	11/13/20 03:50	1
Perfluorooctanesulfonic acid (PFOS)	**0.69**		0.53	0.21	ug/Kg	☼	11/02/20 18:50	11/13/20 03:50	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	11/02/20 18:50	11/13/20 03:50	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	11/02/20 18:50	11/13/20 03:50	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.21	0.028	ug/Kg	☼	11/02/20 18:50	11/13/20 03:50	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.26	0.12	ug/Kg	☼	11/02/20 18:50	11/13/20 03:50	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.21	0.023	ug/Kg	☼	11/02/20 18:50	11/13/20 03:50	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.21	0.019	ug/Kg	☼	11/02/20 18:50	11/13/20 03:50	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*80*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:50*	*1*
13C4 PFHpA	*83*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:50*	*1*
13C4 PFOA	*79*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:50*	*1*
13C5 PFNA	*75*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:50*	*1*
13C2 PFDA	*77*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:50*	*1*
13C2 PFUnA	*66*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:50*	*1*
13C2 PFDoA	*72*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:50*	*1*
13C2 PFTeDA	*61*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:50*	*1*
13C3 PFBS	*77*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:50*	*1*
18O2 PFHxS	*79*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:50*	*1*
13C4 PFOS	*74*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:50*	*1*
d3-NMeFOSAA	*88*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:50*	*1*
d5-NEtFOSAA	*78*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:50*	*1*
13C3 HFPO-DA	*77*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:50*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 10-28-SB5-02
Date Collected: 10/25/20 04:55
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-20
Matrix: Solid
Percent Solids: 94.7

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.043	ug/Kg	☼	11/02/20 18:50	11/13/20 03:59	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.030	ug/Kg	☼	11/02/20 18:50	11/13/20 03:59	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.088	ug/Kg	☼	11/02/20 18:50	11/13/20 03:59	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.037	ug/Kg	☼	11/02/20 18:50	11/13/20 03:59	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg	☼	11/02/20 18:50	11/13/20 03:59	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.037	ug/Kg	☼	11/02/20 18:50	11/13/20 03:59	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.068	ug/Kg	☼	11/02/20 18:50	11/13/20 03:59	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.052	ug/Kg	☼	11/02/20 18:50	11/13/20 03:59	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.055	ug/Kg	☼	11/02/20 18:50	11/13/20 03:59	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg	☼	11/02/20 18:50	11/13/20 03:59	1
Perfluorohexanesulfonic acid (PFHxS)	**0.044**	**J**	0.20	0.032	ug/Kg	☼	11/02/20 18:50	11/13/20 03:59	1
Perfluorooctanesulfonic acid (PFOS)	**0.21**	**J**	0.51	0.20	ug/Kg	☼	11/02/20 18:50	11/13/20 03:59	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.40	ug/Kg	☼	11/02/20 18:50	11/13/20 03:59	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.38	ug/Kg	☼	11/02/20 18:50	11/13/20 03:59	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.028	ug/Kg	☼	11/02/20 18:50	11/13/20 03:59	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.25	0.11	ug/Kg	☼	11/02/20 18:50	11/13/20 03:59	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.022	ug/Kg	☼	11/02/20 18:50	11/13/20 03:59	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg	☼	11/02/20 18:50	11/13/20 03:59	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*92*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:59*	*1*
13C4 PFHpA	*92*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:59*	*1*
13C4 PFOA	*90*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:59*	*1*
13C5 PFNA	*90*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:59*	*1*
13C2 PFDA	*88*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:59*	*1*
13C2 PFUnA	*89*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:59*	*1*
13C2 PFDoA	*78*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:59*	*1*
13C2 PFTeDA	*72*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:59*	*1*
13C3 PFBS	*81*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:59*	*1*
18O2 PFHxS	*84*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:59*	*1*
13C4 PFOS	*83*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:59*	*1*
d3-NMeFOSAA	*106*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:59*	*1*
d5-NEtFOSAA	*103*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:59*	*1*
13C3 HFPO-DA	*84*		*25 - 150*	*11/02/20 18:50*	*11/13/20 03:59*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 10-28-SB5-12
Date Collected: 10/25/20 04:45
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-21
Matrix: Solid
Percent Solids: 93.3

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.041	ug/Kg	☼	11/02/20 18:50	11/13/20 04:09	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.029	ug/Kg	☼	11/02/20 18:50	11/13/20 04:09	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.085	ug/Kg	☼	11/02/20 18:50	11/13/20 04:09	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.035	ug/Kg	☼	11/02/20 18:50	11/13/20 04:09	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg	☼	11/02/20 18:50	11/13/20 04:09	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.035	ug/Kg	☼	11/02/20 18:50	11/13/20 04:09	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.066	ug/Kg	☼	11/02/20 18:50	11/13/20 04:09	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.050	ug/Kg	☼	11/02/20 18:50	11/13/20 04:09	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.053	ug/Kg	☼	11/02/20 18:50	11/13/20 04:09	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg	☼	11/02/20 18:50	11/13/20 04:09	1
Perfluorohexanesulfonic acid (PFHxS)	**0.039**	**J**	0.20	0.031	ug/Kg	☼	11/02/20 18:50	11/13/20 04:09	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.49	0.20	ug/Kg	☼	11/02/20 18:50	11/13/20 04:09	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.38	ug/Kg	☼	11/02/20 18:50	11/13/20 04:09	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.36	ug/Kg	☼	11/02/20 18:50	11/13/20 04:09	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.027	ug/Kg	☼	11/02/20 18:50	11/13/20 04:09	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.25	0.11	ug/Kg	☼	11/02/20 18:50	11/13/20 04:09	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.022	ug/Kg	☼	11/02/20 18:50	11/13/20 04:09	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg	☼	11/02/20 18:50	11/13/20 04:09	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*79*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:09*	*1*
13C4 PFHpA	*78*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:09*	*1*
13C4 PFOA	*77*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:09*	*1*
13C5 PFNA	*70*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:09*	*1*
13C2 PFDA	*77*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:09*	*1*
13C2 PFUnA	*73*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:09*	*1*
13C2 PFDoA	*68*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:09*	*1*
13C2 PFTeDA	*68*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:09*	*1*
13C3 PFBS	*72*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:09*	*1*
18O2 PFHxS	*73*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:09*	*1*
13C4 PFOS	*70*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:09*	*1*
d3-NMeFOSAA	*99*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:09*	*1*
d5-NEtFOSAA	*88*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:09*	*1*
13C3 HFPO-DA	*70*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:09*	*1*

Client Sample ID: 10-28-SB6-01

Date Collected: 10/25/20 05:10
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-22

Matrix: Solid
Percent Solids: 94.3

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.043	ug/Kg	☼	11/02/20 18:50	11/13/20 04:18	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.030	ug/Kg	☼	11/02/20 18:50	11/13/20 04:18	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.088	ug/Kg	☼	11/02/20 18:50	11/13/20 04:18	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.037	ug/Kg	☼	11/02/20 18:50	11/13/20 04:18	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg	☼	11/02/20 18:50	11/13/20 04:18	1
Perfluoroundecanoic acid (PFUnA)	ND	F1	0.20	0.037	ug/Kg	☼	11/02/20 18:50	11/13/20 04:18	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.068	ug/Kg	☼	11/02/20 18:50	11/13/20 04:18	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.052	ug/Kg	☼	11/02/20 18:50	11/13/20 04:18	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.055	ug/Kg	☼	11/02/20 18:50	11/13/20 04:18	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg	☼	11/02/20 18:50	11/13/20 04:18	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.032	ug/Kg	☼	11/02/20 18:50	11/13/20 04:18	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.51	0.20	ug/Kg	☼	11/02/20 18:50	11/13/20 04:18	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.40	ug/Kg	☼	11/02/20 18:50	11/13/20 04:18	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.38	ug/Kg	☼	11/02/20 18:50	11/13/20 04:18	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.028	ug/Kg	☼	11/02/20 18:50	11/13/20 04:18	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.25	0.11	ug/Kg	☼	11/02/20 18:50	11/13/20 04:18	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.022	ug/Kg	☼	11/02/20 18:50	11/13/20 04:18	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg	☼	11/02/20 18:50	11/13/20 04:18	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*82*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:18*	*1*
13C4 PFHpA	*85*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:18*	*1*
13C4 PFOA	*81*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:18*	*1*
13C5 PFNA	*78*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:18*	*1*
13C2 PFDA	*84*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:18*	*1*
13C2 PFUnA	*74*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:18*	*1*
13C2 PFDoA	*74*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:18*	*1*
13C2 PFTeDA	*66*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:18*	*1*
13C3 PFBS	*74*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:18*	*1*
18O2 PFHxS	*75*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:18*	*1*
13C4 PFOS	*74*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:18*	*1*
d3-NMeFOSAA	*92*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:18*	*1*
d5-NEtFOSAA	*95*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:18*	*1*
13C3 HFPO-DA	*75*		*25 - 150*	*11/02/20 18:50*	*11/13/20 04:18*	*1*

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

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)	PFDoA (25-150)	PFTDA (25-150)
320-66141-1	3-21-SB1-01	90	91	92	89	86	82	72	90
320-66141-2	3-21-SB1-02	95	96	96	86	82	86	85	84
320-66141-3	3-21-SB2-01	90	92	94	87	92	82	81	75
320-66141-4	3-21-SB3-01	96	99	97	96	92	100	95	89
320-66141-5	3-21-SB4-01	87	89	91	75	88	86	76	73
320-66141-6	3-21-SB4-02	87	88	90	83	90	77	73	80
320-66141-7	ARFF-SB1-01	87	91	89	87	83	88	83	80
320-66141-8	ARFF-SB1-02	89	90	91	80	82	87	78	80
320-66141-9	ARFF-SB1-03	92	97	96	93	87	93	85	80
320-66141-10	ARFF-SB2-01	86	89	90	82	84	86	84	83
320-66141-11	ARFF-SB2-02	88	89	89	85	81	92	72	72
320-66141-11 MS	ARFF-SB2-02	96	95	94	90	96	86	83	86
320-66141-11 MSD	ARFF-SB2-02	90	95	97	92	87	99	88	81
320-66141-12	ARFF-SB2-03	80	78	79	71	79	75	69	66
320-66141-13	10-28-SB1-01	87	87	83	76	76	77	67	50
320-66141-14	10-28-SB1-02	64	73	79	70	74	77	69	56
320-66141-15	10-28-SB2-01	87	89	88	84	79	76	69	71
320-66141-16	10-28-SB2-02	100	97	95	93	101	87	86	70
320-66141-17	10-28-SB3-01	94	98	98	96	91	84	90	82
320-66141-18	10-28-SB4-02	85	87	94	91	93	80	69	50
320-66141-19	10-28-SB5-01	80	83	79	75	77	66	72	61
320-66141-20	10-28-SB5-02	92	92	90	90	88	89	78	72
320-66141-21	10-28-SB5-12	79	78	77	70	77	73	68	68
320-66141-22	10-28-SB6-01	82	85	81	78	84	74	74	66
320-66141-22 MS	10-28-SB6-01	97	91	94	89	90	78	81	71
320-66141-22 MSD	10-28-SB6-01	87	86	87	82	76	81	82	73
LCS 320-427872/2-A	Lab Control Sample	89	98	98	90	84	89	82	84
LCS 320-427878/2-A	Lab Control Sample	91	96	99	94	89	87	83	88
MB 320-427872/1-A	Method Blank	89	94	95	82	84	88	82	80
MB 320-427878/1-A	Method Blank	92	97	96	91	91	87	91	92

		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)		
320-66141-1	3-21-SB1-01	82	79	81	104	91	82		
320-66141-2	3-21-SB1-02	93	93	88	106	94	87		
320-66141-3	3-21-SB2-01	86	88	86	99	98	87		
320-66141-4	3-21-SB3-01	91	89	94	104	110	92		
320-66141-5	3-21-SB4-01	77	75	75	81	79	82		
320-66141-6	3-21-SB4-02	77	76	75	105	97	82		
320-66141-7	ARFF-SB1-01	77	73	76	113	103	83		
320-66141-8	ARFF-SB1-02	84	83	82	99	100	85		
320-66141-9	ARFF-SB1-03	92	92	94	102	109	91		
320-66141-10	ARFF-SB2-01	78	80	76	93	94	87		
320-66141-11	ARFF-SB2-02	88	84	84	109	104	84		
320-66141-11 MS	ARFF-SB2-02	89	91	85	113	95	88		
320-66141-11 MSD	ARFF-SB2-02	91	90	87	108	96	86		
320-66141-12	ARFF-SB2-03	77	77	73	92	87	73		
320-66141-13	10-28-SB1-01	84	77	76	77	76	81		
320-66141-14	10-28-SB1-02	54	81	81	69	70	57		

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

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	C3PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	d3NMFOS (25-150)	d5NEFOS (25-150)	HFPODA (25-150)		
320-66141-15	10-28-SB2-01	83	86	85	87	84	84		
320-66141-16	10-28-SB2-02	88	91	91	108	106	90		
320-66141-17	10-28-SB3-01	89	86	85	100	110	91		
320-66141-18	10-28-SB4-02	77	94	96	79	79	77		
320-66141-19	10-28-SB5-01	77	79	74	88	78	77		
320-66141-20	10-28-SB5-02	81	84	83	106	103	84		
320-66141-21	10-28-SB5-12	72	73	70	99	88	70		
320-66141-22	10-28-SB6-01	74	75	74	92	95	75		
320-66141-22 MS	10-28-SB6-01	84	90	83	101	108	86		
320-66141-22 MSD	10-28-SB6-01	75	81	74	96	96	79		
LCS 320-427872/2-A	Lab Control Sample	96	97	93	97	101	89		
LCS 320-427878/2-A	Lab Control Sample	91	98	98	93	93	92		
MB 320-427872/1-A	Method Blank	91	90	92	93	93	87		
MB 320-427878/1-A	Method Blank	90	97	93	93	96	91		

Surrogate Legend

PFHxA = 13C2 PFHxA
C4PFHA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA
PFUnA = 13C2 PFUnA
PFDoA = 13C2 PFDoA
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

Lab Sample ID: MB 320-427872/1-A
Matrix: Solid
Analysis Batch: 430726

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 427872

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.042	ug/Kg		11/02/20 18:31	11/12/20 03:18	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.029	ug/Kg		11/02/20 18:31	11/12/20 03:18	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.086	ug/Kg		11/02/20 18:31	11/12/20 03:18	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.036	ug/Kg		11/02/20 18:31	11/12/20 03:18	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg		11/02/20 18:31	11/12/20 03:18	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036	ug/Kg		11/02/20 18:31	11/12/20 03:18	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.067	ug/Kg		11/02/20 18:31	11/12/20 03:18	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051	ug/Kg		11/02/20 18:31	11/12/20 03:18	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054	ug/Kg		11/02/20 18:31	11/12/20 03:18	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg		11/02/20 18:31	11/12/20 03:18	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.031	ug/Kg		11/02/20 18:31	11/12/20 03:18	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.50	0.20	ug/Kg		11/02/20 18:31	11/12/20 03:18	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg		11/02/20 18:31	11/12/20 03:18	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg		11/02/20 18:31	11/12/20 03:18	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.027	ug/Kg		11/02/20 18:31	11/12/20 03:18	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.25	0.11	ug/Kg		11/02/20 18:31	11/12/20 03:18	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.022	ug/Kg		11/02/20 18:31	11/12/20 03:18	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg		11/02/20 18:31	11/12/20 03:18	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*89*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:18*	*1*
13C4 PFHpA	*94*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:18*	*1*
13C4 PFOA	*95*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:18*	*1*
13C5 PFNA	*82*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:18*	*1*
13C2 PFDA	*84*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:18*	*1*
13C2 PFUnA	*88*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:18*	*1*
13C2 PFDoA	*82*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:18*	*1*
13C2 PFTeDA	*80*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:18*	*1*
13C3 PFBS	*91*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:18*	*1*
18O2 PFHxS	*90*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:18*	*1*
13C4 PFOS	*92*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:18*	*1*
d3-NMeFOSAA	*93*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:18*	*1*
d5-NEtFOSAA	*93*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:18*	*1*
13C3 HFPO-DA	*87*		*25 - 150*	*11/02/20 18:31*	*11/12/20 03:18*	*1*

Lab Sample ID: LCS 320-427872/2-A
Matrix: Solid
Analysis Batch: 430726

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 427872

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	2.00		ug/Kg		100	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	1.82		ug/Kg		91	72 - 132
Perfluorononanoic acid (PFNA)	2.00	1.98		ug/Kg		99	73 - 133

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-427872/2-A
Matrix: Solid
Analysis Batch: 430726

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 427872

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorodecanoic acid (PFDA)	2.00	2.12		ug/Kg		106	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	1.62		ug/Kg		81	66 - 126
Perfluorododecanoic acid (PFDoA)	2.00	2.35		ug/Kg		117	71 - 131
Perfluorotridecanoic acid (PFTriA)	2.00	2.42		ug/Kg		121	71 - 131
Perfluorotetradecanoic acid (PFTeA)	2.00	2.20		ug/Kg		110	67 - 127
Perfluorobutanesulfonic acid (PFBS)	1.77	1.77		ug/Kg		100	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.75		ug/Kg		96	62 - 122
Perfluorooctanesulfonic acid (PFOS)	1.86	2.00		ug/Kg		108	68 - 141
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	1.86	1.95		ug/Kg		105	74 - 134
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	2.00	1.95		ug/Kg		98	53 - 158
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	1.88	2.00		ug/Kg		106	66 - 136
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.88	2.09		ug/Kg		111	79 - 139

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*89*		*25 - 150*
13C4 PFHpA	*98*		*25 - 150*
13C4 PFOA	*98*		*25 - 150*
13C5 PFNA	*90*		*25 - 150*
13C2 PFDA	*84*		*25 - 150*
13C2 PFUnA	*89*		*25 - 150*
13C2 PFDoA	*82*		*25 - 150*
13C2 PFTeDA	*84*		*25 - 150*
13C3 PFBS	*96*		*25 - 150*
18O2 PFHxS	*97*		*25 - 150*
13C4 PFOS	*93*		*25 - 150*
d3-NMeFOSAA	*97*		*25 - 150*
d5-NEtFOSAA	*101*		*25 - 150*
13C3 HFPO-DA	*89*		*25 - 150*

Lab Sample ID: 320-66141-11 MS
Matrix: Solid
Analysis Batch: 430726

Client Sample ID: ARFF-SB2-02
Prep Type: Total/NA
Prep Batch: 427872

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	0.059	J	2.24	2.18		ug/Kg	☼	95	71 - 131
Perfluoroheptanoic acid (PFHpA)	ND		2.24	2.20		ug/Kg	☼	98	71 - 131
Perfluorooctanoic acid (PFOA)	ND		2.24	1.95		ug/Kg	☼	87	72 - 132
Perfluorononanoic acid (PFNA)	ND		2.24	2.07		ug/Kg	☼	92	73 - 133
Perfluorodecanoic acid (PFDA)	ND		2.24	2.02		ug/Kg	☼	90	72 - 132
Perfluoroundecanoic acid (PFUnA)	ND		2.24	2.51		ug/Kg	☼	112	66 - 126

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-66141-11 MS
Matrix: Solid
Analysis Batch: 430726

Client Sample ID: ARFF-SB2-02
Prep Type: Total/NA
Prep Batch: 427872

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorododecanoic acid (PFDoA)	ND		2.24	2.17		ug/Kg	☼	97	71 - 131
Perfluorotridecanoic acid (PFTriA)	ND		2.24	2.26		ug/Kg	☼	101	71 - 131
Perfluorotetradecanoic acid (PFTeA)	ND		2.24	2.14		ug/Kg	☼	96	67 - 127
Perfluorobutanesulfonic acid (PFBS)	0.048	J	1.98	2.05		ug/Kg	☼	101	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	0.043	J	2.03	1.93		ug/Kg	☼	93	62 - 122
Perfluorooctanesulfonic acid (PFOS)	0.35	J	2.07	2.73		ug/Kg	☼	114	68 - 141
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.08	2.42		ug/Kg	☼	116	74 - 134
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		2.24	2.12		ug/Kg	☼	95	53 - 158
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.11	2.45		ug/Kg	☼	116	66 - 136
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.11	2.39		ug/Kg	☼	114	79 - 139

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C2 PFHxA	*96*		*25 - 150*
13C4 PFHpA	*95*		*25 - 150*
13C4 PFOA	*94*		*25 - 150*
13C5 PFNA	*90*		*25 - 150*
13C2 PFDA	*96*		*25 - 150*
13C2 PFUnA	*86*		*25 - 150*
13C2 PFDoA	*83*		*25 - 150*
13C2 PFTeDA	*86*		*25 - 150*
13C3 PFBS	*89*		*25 - 150*
18O2 PFHxS	*91*		*25 - 150*
13C4 PFOS	*85*		*25 - 150*
d3-NMeFOSAA	*113*		*25 - 150*
d5-NEtFOSAA	*95*		*25 - 150*
13C3 HFPO-DA	*88*		*25 - 150*

Lab Sample ID: 320-66141-11 MSD
Matrix: Solid
Analysis Batch: 430726

Client Sample ID: ARFF-SB2-02
Prep Type: Total/NA
Prep Batch: 427872

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	0.059	J	2.20	2.46		ug/Kg	☼	109	71 - 131	12	30
Perfluoroheptanoic acid (PFHpA)	ND		2.20	2.20		ug/Kg	☼	100	71 - 131	0	30
Perfluorooctanoic acid (PFOA)	ND		2.20	1.93		ug/Kg	☼	88	72 - 132	1	30
Perfluorononanoic acid (PFNA)	ND		2.20	2.16		ug/Kg	☼	98	73 - 133	4	30
Perfluorodecanoic acid (PFDA)	ND		2.20	2.31		ug/Kg	☼	105	72 - 132	13	30
Perfluoroundecanoic acid (PFUnA)	ND		2.20	2.32		ug/Kg	☼	106	66 - 126	8	30
Perfluorododecanoic acid (PFDoA)	ND		2.20	2.47		ug/Kg	☼	113	71 - 131	13	30

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-66141-11 MSD
Matrix: Solid
Analysis Batch: 430726

Client Sample ID: ARFF-SB2-02
Prep Type: Total/NA
Prep Batch: 427872

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorotridecanoic acid (PFTriA)	ND		2.20	2.21		ug/Kg	☼	101	71 - 131	2	30
Perfluorotetradecanoic acid (PFTeA)	ND		2.20	2.32		ug/Kg	☼	105	67 - 127	8	30
Perfluorobutanesulfonic acid (PFBS)	0.048	J	1.94	2.01		ug/Kg	☼	101	69 - 129	2	30
Perfluorohexanesulfonic acid (PFHxS)	0.043	J	2.00	1.99		ug/Kg	☼	97	62 - 122	3	30
Perfluorooctanesulfonic acid (PFOS)	0.35	J	2.04	2.65		ug/Kg	☼	113	68 - 141	3	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.05	2.31		ug/Kg	☼	113	74 - 134	5	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		2.20	2.18		ug/Kg	☼	99	53 - 158	3	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.07	2.45		ug/Kg	☼	118	66 - 136	0	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.07	2.37		ug/Kg	☼	114	79 - 139	1	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C2 PFHxA	*90*		*25 - 150*
13C4 PFHpA	*95*		*25 - 150*
13C4 PFOA	*97*		*25 - 150*
13C5 PFNA	*92*		*25 - 150*
13C2 PFDA	*87*		*25 - 150*
13C2 PFUnA	*99*		*25 - 150*
13C2 PFDoA	*88*		*25 - 150*
13C2 PFTeDA	*81*		*25 - 150*
13C3 PFBS	*91*		*25 - 150*
18O2 PFHxS	*90*		*25 - 150*
13C4 PFOS	*87*		*25 - 150*
d3-NMeFOSAA	*108*		*25 - 150*
d5-NEtFOSAA	*96*		*25 - 150*
13C3 HFPO-DA	*86*		*25 - 150*

Lab Sample ID: MB 320-427878/1-A
Matrix: Solid
Analysis Batch: 431104

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 427878

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.042	ug/Kg		11/02/20 18:50	11/13/20 02:06	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.029	ug/Kg		11/02/20 18:50	11/13/20 02:06	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.086	ug/Kg		11/02/20 18:50	11/13/20 02:06	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.036	ug/Kg		11/02/20 18:50	11/13/20 02:06	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg		11/02/20 18:50	11/13/20 02:06	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036	ug/Kg		11/02/20 18:50	11/13/20 02:06	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.067	ug/Kg		11/02/20 18:50	11/13/20 02:06	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051	ug/Kg		11/02/20 18:50	11/13/20 02:06	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054	ug/Kg		11/02/20 18:50	11/13/20 02:06	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg		11/02/20 18:50	11/13/20 02:06	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.031	ug/Kg		11/02/20 18:50	11/13/20 02:06	1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-427878/1-A
Matrix: Solid
Analysis Batch: 431104

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 427878

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	ND		0.50	0.20	ug/Kg		11/02/20 18:50	11/13/20 02:06	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg		11/02/20 18:50	11/13/20 02:06	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg		11/02/20 18:50	11/13/20 02:06	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.027	ug/Kg		11/02/20 18:50	11/13/20 02:06	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.25	0.11	ug/Kg		11/02/20 18:50	11/13/20 02:06	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.022	ug/Kg		11/02/20 18:50	11/13/20 02:06	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg		11/02/20 18:50	11/13/20 02:06	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*92*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:06*	*1*
13C4 PFHpA	*97*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:06*	*1*
13C4 PFOA	*96*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:06*	*1*
13C5 PFNA	*91*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:06*	*1*
13C2 PFDA	*91*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:06*	*1*
13C2 PFUnA	*87*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:06*	*1*
13C2 PFDoA	*91*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:06*	*1*
13C2 PFTeDA	*92*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:06*	*1*
13C3 PFBS	*90*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:06*	*1*
18O2 PFHxS	*97*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:06*	*1*
13C4 PFOS	*93*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:06*	*1*
d3-NMeFOSAA	*93*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:06*	*1*
d5-NEtFOSAA	*96*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:06*	*1*
13C3 HFPO-DA	*91*		*25 - 150*	*11/02/20 18:50*	*11/13/20 02:06*	*1*

Lab Sample ID: LCS 320-427878/2-A
Matrix: Solid
Analysis Batch: 431104

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 427878

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	2.00	2.10		ug/Kg		105	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	2.09		ug/Kg		105	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	1.88		ug/Kg		94	72 - 132
Perfluorononanoic acid (PFNA)	2.00	2.05		ug/Kg		102	73 - 133
Perfluorodecanoic acid (PFDA)	2.00	2.07		ug/Kg		104	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	1.86		ug/Kg		93	66 - 126
Perfluorododecanoic acid (PFDoA)	2.00	2.25		ug/Kg		112	71 - 131
Perfluorotridecanoic acid (PFTriA)	2.00	2.08		ug/Kg		104	71 - 131
Perfluorotetradecanoic acid (PFTeA)	2.00	2.33		ug/Kg		117	67 - 127
Perfluorobutanesulfonic acid (PFBS)	1.77	1.98		ug/Kg		112	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.78		ug/Kg		98	62 - 122

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-427878/2-A
Matrix: Solid
Analysis Batch: 431104

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 427878

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	1.86	2.17		ug/Kg		117	68 - 141
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	1.86	1.88		ug/Kg		101	74 - 134
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	2.00	1.97		ug/Kg		99	53 - 158
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	1.88	1.93		ug/Kg		103	66 - 136
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.88	2.03		ug/Kg		108	79 - 139

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*91*		*25 - 150*
13C4 PFHpA	*96*		*25 - 150*
13C4 PFOA	*99*		*25 - 150*
13C5 PFNA	*94*		*25 - 150*
13C2 PFDA	*89*		*25 - 150*
13C2 PFUnA	*87*		*25 - 150*
13C2 PFDoA	*83*		*25 - 150*
13C2 PFTeDA	*88*		*25 - 150*
13C3 PFBS	*91*		*25 - 150*
18O2 PFHxS	*98*		*25 - 150*
13C4 PFOS	*98*		*25 - 150*
d3-NMeFOSAA	*93*		*25 - 150*
d5-NEtFOSAA	*93*		*25 - 150*
13C3 HFPO-DA	*92*		*25 - 150*

Lab Sample ID: 320-66141-22 MS
Matrix: Solid
Analysis Batch: 431104

Client Sample ID: 10-28-SB6-01
Prep Type: Total/NA
Prep Batch: 427878

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	ND		1.98	2.02		ug/Kg	☼	102	71 - 131
Perfluoroheptanoic acid (PFHpA)	ND		1.98	2.21		ug/Kg	☼	112	71 - 131
Perfluorooctanoic acid (PFOA)	ND		1.98	1.88		ug/Kg	☼	95	72 - 132
Perfluorononanoic acid (PFNA)	ND		1.98	2.19		ug/Kg	☼	111	73 - 133
Perfluorodecanoic acid (PFDA)	ND		1.98	1.98		ug/Kg	☼	100	72 - 132
Perfluoroundecanoic acid (PFUnA)	ND	F1	1.98	2.69	F1	ug/Kg	☼	136	66 - 126
Perfluorododecanoic acid (PFDoA)	ND		1.98	2.25		ug/Kg	☼	113	71 - 131
Perfluorotridecanoic acid (PFTriA)	ND		1.98	1.98		ug/Kg	☼	100	71 - 131
Perfluorotetradecanoic acid (PFTeA)	ND		1.98	1.99		ug/Kg	☼	100	67 - 127
Perfluorobutanesulfonic acid (PFBS)	ND		1.75	1.90		ug/Kg	☼	109	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	ND		1.80	1.85		ug/Kg	☼	102	62 - 122
Perfluorooctanesulfonic acid (PFOS)	ND		1.84	2.14		ug/Kg	☼	116	68 - 141

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-66141-22 MS
Matrix: Solid
Analysis Batch: 431104

Client Sample ID: 10-28-SB6-01
Prep Type: Total/NA
Prep Batch: 427878

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.85	2.16		ug/Kg	☼	117	74 - 134
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		1.98	2.06		ug/Kg	☼	104	53 - 158
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.87	2.09		ug/Kg	☼	112	66 - 136
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.87	2.25		ug/Kg	☼	120	79 - 139

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C2 PFHxA	*97*		*25 - 150*
13C4 PFHpA	*91*		*25 - 150*
13C4 PFOA	*94*		*25 - 150*
13C5 PFNA	*89*		*25 - 150*
13C2 PFDA	*90*		*25 - 150*
13C2 PFUnA	*78*		*25 - 150*
13C2 PFDoA	*81*		*25 - 150*
13C2 PFTeDA	*71*		*25 - 150*
13C3 PFBS	*84*		*25 - 150*
18O2 PFHxS	*90*		*25 - 150*
13C4 PFOS	*83*		*25 - 150*
d3-NMeFOSAA	*101*		*25 - 150*
d5-NEtFOSAA	*108*		*25 - 150*
13C3 HFPO-DA	*86*		*25 - 150*

Lab Sample ID: 320-66141-22 MSD
Matrix: Solid
Analysis Batch: 431104

Client Sample ID: 10-28-SB6-01
Prep Type: Total/NA
Prep Batch: 427878

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	ND		2.10	2.19		ug/Kg	☼	104	71 - 131	8	30
Perfluoroheptanoic acid (PFHpA)	ND		2.10	2.19		ug/Kg	☼	104	71 - 131	1	30
Perfluorooctanoic acid (PFOA)	ND		2.10	1.97		ug/Kg	☼	94	72 - 132	5	30
Perfluorononanoic acid (PFNA)	ND		2.10	2.21		ug/Kg	☼	105	73 - 133	1	30
Perfluorodecanoic acid (PFDA)	ND		2.10	2.11		ug/Kg	☼	100	72 - 132	6	30
Perfluoroundecanoic acid (PFUnA)	ND	F1	2.10	2.40		ug/Kg	☼	114	66 - 126	11	30
Perfluorododecanoic acid (PFDoA)	ND		2.10	2.30		ug/Kg	☼	109	71 - 131	2	30
Perfluorotridecanoic acid (PFTriA)	ND		2.10	1.84		ug/Kg	☼	87	71 - 131	7	30
Perfluorotetradecanoic acid (PFTeA)	ND		2.10	2.23		ug/Kg	☼	106	67 - 127	11	30
Perfluorobutanesulfonic acid (PFBS)	ND		1.86	1.97		ug/Kg	☼	106	69 - 129	4	30
Perfluorohexanesulfonic acid (PFHxS)	ND		1.91	1.92		ug/Kg	☼	100	62 - 122	4	30
Perfluorooctanesulfonic acid (PFOS)	ND		1.95	2.47		ug/Kg	☼	126	68 - 141	14	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.96	2.35		ug/Kg	☼	120	74 - 134	8	30

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-66141-22 MSD
Matrix: Solid
Analysis Batch: 431104

Client Sample ID: 10-28-SB6-01
Prep Type: Total/NA
Prep Batch: 427878

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		2.10	2.16		ug/Kg	☼	103	53 - 158	5	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.98	2.30		ug/Kg	☼	116	66 - 136	10	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.98	2.47		ug/Kg	☼	124	79 - 139	9	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C2 PFHxA	*87*		*25 - 150*
13C4 PFHpA	*86*		*25 - 150*
13C4 PFOA	*87*		*25 - 150*
13C5 PFNA	*82*		*25 - 150*
13C2 PFDA	*76*		*25 - 150*
13C2 PFUnA	*81*		*25 - 150*
13C2 PFDoA	*82*		*25 - 150*
13C2 PFTeDA	*73*		*25 - 150*
13C3 PFBS	*75*		*25 - 150*
18O2 PFHxS	*81*		*25 - 150*
13C4 PFOS	*74*		*25 - 150*
d3-NMeFOSAA	*96*		*25 - 150*
d5-NEtFOSAA	*96*		*25 - 150*
13C3 HFPO-DA	*79*		*25 - 150*

LCMS

Prep Batch: 427872

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66141-1	3-21-SB1-01	Total/NA	Solid	SHAKE	
320-66141-2	3-21-SB1-02	Total/NA	Solid	SHAKE	
320-66141-3	3-21-SB2-01	Total/NA	Solid	SHAKE	
320-66141-4	3-21-SB3-01	Total/NA	Solid	SHAKE	
320-66141-5	3-21-SB4-01	Total/NA	Solid	SHAKE	
320-66141-6	3-21-SB4-02	Total/NA	Solid	SHAKE	
320-66141-7	ARFF-SB1-01	Total/NA	Solid	SHAKE	
320-66141-8	ARFF-SB1-02	Total/NA	Solid	SHAKE	
320-66141-9	ARFF-SB1-03	Total/NA	Solid	SHAKE	
320-66141-10	ARFF-SB2-01	Total/NA	Solid	SHAKE	
320-66141-11	ARFF-SB2-02	Total/NA	Solid	SHAKE	
MB 320-427872/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-427872/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-66141-11 MS	ARFF-SB2-02	Total/NA	Solid	SHAKE	
320-66141-11 MSD	ARFF-SB2-02	Total/NA	Solid	SHAKE	

Prep Batch: 427878

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66141-12	ARFF-SB2-03	Total/NA	Solid	SHAKE	
320-66141-13	10-28-SB1-01	Total/NA	Solid	SHAKE	
320-66141-14	10-28-SB1-02	Total/NA	Solid	SHAKE	
320-66141-15	10-28-SB2-01	Total/NA	Solid	SHAKE	
320-66141-16	10-28-SB2-02	Total/NA	Solid	SHAKE	
320-66141-17	10-28-SB3-01	Total/NA	Solid	SHAKE	
320-66141-18	10-28-SB4-02	Total/NA	Solid	SHAKE	
320-66141-19	10-28-SB5-01	Total/NA	Solid	SHAKE	
320-66141-20	10-28-SB5-02	Total/NA	Solid	SHAKE	
320-66141-21	10-28-SB5-12	Total/NA	Solid	SHAKE	
320-66141-22	10-28-SB6-01	Total/NA	Solid	SHAKE	
MB 320-427878/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-427878/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-66141-22 MS	10-28-SB6-01	Total/NA	Solid	SHAKE	
320-66141-22 MSD	10-28-SB6-01	Total/NA	Solid	SHAKE	

Analysis Batch: 430726

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66141-1	3-21-SB1-01	Total/NA	Solid	537 (modified)	427872
320-66141-2	3-21-SB1-02	Total/NA	Solid	537 (modified)	427872
320-66141-3	3-21-SB2-01	Total/NA	Solid	537 (modified)	427872
320-66141-4	3-21-SB3-01	Total/NA	Solid	537 (modified)	427872
320-66141-5	3-21-SB4-01	Total/NA	Solid	537 (modified)	427872
320-66141-6	3-21-SB4-02	Total/NA	Solid	537 (modified)	427872
320-66141-7	ARFF-SB1-01	Total/NA	Solid	537 (modified)	427872
320-66141-8	ARFF-SB1-02	Total/NA	Solid	537 (modified)	427872
320-66141-9	ARFF-SB1-03	Total/NA	Solid	537 (modified)	427872
320-66141-10	ARFF-SB2-01	Total/NA	Solid	537 (modified)	427872
320-66141-11	ARFF-SB2-02	Total/NA	Solid	537 (modified)	427872
MB 320-427872/1-A	Method Blank	Total/NA	Solid	537 (modified)	427872
LCS 320-427872/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	427872
320-66141-11 MS	ARFF-SB2-02	Total/NA	Solid	537 (modified)	427872
320-66141-11 MSD	ARFF-SB2-02	Total/NA	Solid	537 (modified)	427872

LCMS

Analysis Batch: 431104

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66141-12	ARFF-SB2-03	Total/NA	Solid	537 (modified)	427878
320-66141-13	10-28-SB1-01	Total/NA	Solid	537 (modified)	427878
320-66141-14	10-28-SB1-02	Total/NA	Solid	537 (modified)	427878
320-66141-15	10-28-SB2-01	Total/NA	Solid	537 (modified)	427878
320-66141-16	10-28-SB2-02	Total/NA	Solid	537 (modified)	427878
320-66141-17	10-28-SB3-01	Total/NA	Solid	537 (modified)	427878
320-66141-18	10-28-SB4-02	Total/NA	Solid	537 (modified)	427878
320-66141-19	10-28-SB5-01	Total/NA	Solid	537 (modified)	427878
320-66141-20	10-28-SB5-02	Total/NA	Solid	537 (modified)	427878
320-66141-21	10-28-SB5-12	Total/NA	Solid	537 (modified)	427878
320-66141-22	10-28-SB6-01	Total/NA	Solid	537 (modified)	427878
MB 320-427878/1-A	Method Blank	Total/NA	Solid	537 (modified)	427878
LCS 320-427878/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	427878
320-66141-22 MS	10-28-SB6-01	Total/NA	Solid	537 (modified)	427878
320-66141-22 MSD	10-28-SB6-01	Total/NA	Solid	537 (modified)	427878

General Chemistry

Analysis Batch: 426968

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66141-1	3-21-SB1-01	Total/NA	Solid	D 2216	
320-66141-2	3-21-SB1-02	Total/NA	Solid	D 2216	
320-66141-3	3-21-SB2-01	Total/NA	Solid	D 2216	
320-66141-4	3-21-SB3-01	Total/NA	Solid	D 2216	
320-66141-5	3-21-SB4-01	Total/NA	Solid	D 2216	
320-66141-6	3-21-SB4-02	Total/NA	Solid	D 2216	
320-66141-7	ARFF-SB1-01	Total/NA	Solid	D 2216	
320-66141-8	ARFF-SB1-02	Total/NA	Solid	D 2216	
320-66141-1 DU	3-21-SB1-01	Total/NA	Solid	D 2216	

Analysis Batch: 427776

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66141-9	ARFF-SB1-03	Total/NA	Solid	D 2216	
320-66141-10	ARFF-SB2-01	Total/NA	Solid	D 2216	
320-66141-11	ARFF-SB2-02	Total/NA	Solid	D 2216	
320-66141-12	ARFF-SB2-03	Total/NA	Solid	D 2216	
320-66141-13	10-28-SB1-01	Total/NA	Solid	D 2216	
320-66141-14	10-28-SB1-02	Total/NA	Solid	D 2216	
320-66141-15	10-28-SB2-01	Total/NA	Solid	D 2216	
320-66141-16	10-28-SB2-02	Total/NA	Solid	D 2216	
320-66141-17	10-28-SB3-01	Total/NA	Solid	D 2216	
320-66141-18	10-28-SB4-02	Total/NA	Solid	D 2216	
320-66141-19	10-28-SB5-01	Total/NA	Solid	D 2216	
320-66141-20	10-28-SB5-02	Total/NA	Solid	D 2216	
320-66141-21	10-28-SB5-12	Total/NA	Solid	D 2216	
320-66141-22	10-28-SB6-01	Total/NA	Solid	D 2216	
320-66141-9 DU	ARFF-SB1-03	Total/NA	Solid	D 2216	

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 3-21-SB1-01
Date Collected: 10/23/20 19:00
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-1
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			426968	10/30/20 12:54	KDB	TAL SAC

Client Sample ID: 3-21-SB1-01
Date Collected: 10/23/20 19:00
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-1
Matrix: Solid
Percent Solids: 93.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.17 g	10.00 mL	427872	11/02/20 18:31	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			430726	11/12/20 03:56	JC	TAL SAC

Client Sample ID: 3-21-SB1-02
Date Collected: 10/23/20 19:15
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-2
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			426968	10/30/20 12:54	KDB	TAL SAC

Client Sample ID: 3-21-SB1-02
Date Collected: 10/23/20 19:15
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-2
Matrix: Solid
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			5.14 g	10.00 mL	427872	11/02/20 18:31	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			430726	11/12/20 04:05	JC	TAL SAC

Client Sample ID: 3-21-SB2-01
Date Collected: 10/23/20 21:30
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-3
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			426968	10/30/20 12:54	KDB	TAL SAC

Client Sample ID: 3-21-SB2-01
Date Collected: 10/23/20 21:30
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-3
Matrix: Solid
Percent Solids: 92.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.28 g	10.00 mL	427872	11/02/20 18:31	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			430726	11/12/20 04:15	JC	TAL SAC

Client Sample ID: 3-21-SB3-01
Date Collected: 10/23/20 22:00
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-4
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			426968	10/30/20 12:54	KDB	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 3-21-SB3-01
Lab Sample ID: 320-66141-4
Date Collected: 10/23/20 22:00
Matrix: Solid
Date Received: 10/29/20 10:55
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			5.42 g	10.00 mL	427872	11/02/20 18:31	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			430726	11/12/20 04:24	JC	TAL SAC

Client Sample ID: 3-21-SB4-01
Lab Sample ID: 320-66141-5
Date Collected: 10/24/20 01:45
Matrix: Solid
Date Received: 10/29/20 10:55

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			426968	10/30/20 12:54	KDB	TAL SAC

Client Sample ID: 3-21-SB4-01
Lab Sample ID: 320-66141-5
Date Collected: 10/24/20 01:45
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 93.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.03 g	10.00 mL	427872	11/02/20 18:31	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			430726	11/12/20 04:34	JC	TAL SAC

Client Sample ID: 3-21-SB4-02
Lab Sample ID: 320-66141-6
Date Collected: 10/24/20 01:55
Matrix: Solid
Date Received: 10/29/20 10:55

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			426968	10/30/20 12:54	KDB	TAL SAC

Client Sample ID: 3-21-SB4-02
Lab Sample ID: 320-66141-6
Date Collected: 10/24/20 01:55
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 93.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.06 g	10.00 mL	427872	11/02/20 18:31	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			430726	11/12/20 04:43	JC	TAL SAC

Client Sample ID: ARFF-SB1-01
Lab Sample ID: 320-66141-7
Date Collected: 10/24/20 03:35
Matrix: Solid
Date Received: 10/29/20 10:55

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			426968	10/30/20 12:54	KDB	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: ARFF-SB1-01
Lab Sample ID: 320-66141-7
Date Collected: 10/24/20 03:35
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 93.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.34 g	10.00 mL	427872	11/02/20 18:31	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			430726	11/12/20 05:11	JC	TAL SAC

Client Sample ID: ARFF-SB1-02
Lab Sample ID: 320-66141-8
Date Collected: 10/24/20 03:45
Matrix: Solid
Date Received: 10/29/20 10:55

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			426968	10/30/20 12:54	KDB	TAL SAC

Client Sample ID: ARFF-SB1-02
Lab Sample ID: 320-66141-8
Date Collected: 10/24/20 03:45
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 89.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.46 g	10.00 mL	427872	11/02/20 18:31	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			430726	11/12/20 05:21	JC	TAL SAC

Client Sample ID: ARFF-SB1-03
Lab Sample ID: 320-66141-9
Date Collected: 10/24/20 04:00
Matrix: Solid
Date Received: 10/29/20 10:55

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			427776	11/02/20 15:57	KDB	TAL SAC

Client Sample ID: ARFF-SB1-03
Lab Sample ID: 320-66141-9
Date Collected: 10/24/20 04:00
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 88.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.37 g	10.00 mL	427872	11/02/20 18:31	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			430726	11/12/20 05:30	JC	TAL SAC

Client Sample ID: ARFF-SB2-01
Lab Sample ID: 320-66141-10
Date Collected: 10/24/20 04:30
Matrix: Solid
Date Received: 10/29/20 10:55

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			427776	11/02/20 15:57	KDB	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: ARFF-SB2-01
Lab Sample ID: 320-66141-10
Date Collected: 10/24/20 04:30
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 96.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.41 g	10.00 mL	427872	11/02/20 18:31	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			430726	11/12/20 05:39	JC	TAL SAC

Client Sample ID: ARFF-SB2-02
Lab Sample ID: 320-66141-11
Date Collected: 10/24/20 04:45
Matrix: Solid
Date Received: 10/29/20 10:55

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			427776	11/02/20 15:57	KDB	TAL SAC

Client Sample ID: ARFF-SB2-02
Lab Sample ID: 320-66141-11
Date Collected: 10/24/20 04:45
Matrix: Solid
Date Received: 10/29/20 10:55
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			5.33 g	10.00 mL	427872	11/02/20 18:31	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			430726	11/12/20 05:49	JC	TAL SAC

Client Sample ID: ARFF-SB2-03
Lab Sample ID: 320-66141-12
Date Collected: 10/24/20 04:55
Matrix: Solid
Date Received: 10/29/20 10:55

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			427776	11/02/20 15:57	KDB	TAL SAC

Client Sample ID: ARFF-SB2-03
Lab Sample ID: 320-66141-12
Date Collected: 10/24/20 04:55
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 81.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.28 g	10.00 mL	427878	11/02/20 18:50	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			431104	11/13/20 02:25	K1S	TAL SAC

Client Sample ID: 10-28-SB1-01
Lab Sample ID: 320-66141-13
Date Collected: 10/24/20 23:10
Matrix: Solid
Date Received: 10/29/20 10:55

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			427776	11/02/20 15:57	KDB	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 10-28-SB1-01
Lab Sample ID: 320-66141-13
Date Collected: 10/24/20 23:10
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 92.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.14 g	10.00 mL	427878	11/02/20 18:50	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			431104	11/13/20 02:35	K1S	TAL SAC

Client Sample ID: 10-28-SB1-02
Lab Sample ID: 320-66141-14
Date Collected: 10/24/20 23:30
Matrix: Solid
Date Received: 10/29/20 10:55

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			427776	11/02/20 15:57	KDB	TAL SAC

Client Sample ID: 10-28-SB1-02
Lab Sample ID: 320-66141-14
Date Collected: 10/24/20 23:30
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 55.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.15 g	10.00 mL	427878	11/02/20 18:50	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			431104	11/13/20 02:44	K1S	TAL SAC

Client Sample ID: 10-28-SB2-01
Lab Sample ID: 320-66141-15
Date Collected: 10/25/20 00:45
Matrix: Solid
Date Received: 10/29/20 10:55

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			427776	11/02/20 15:57	KDB	TAL SAC

Client Sample ID: 10-28-SB2-01
Lab Sample ID: 320-66141-15
Date Collected: 10/25/20 00:45
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 94.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.42 g	10.00 mL	427878	11/02/20 18:50	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			431104	11/13/20 02:53	K1S	TAL SAC

Client Sample ID: 10-28-SB2-02
Lab Sample ID: 320-66141-16
Date Collected: 10/25/20 00:55
Matrix: Solid
Date Received: 10/29/20 10:55

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			427776	11/02/20 15:57	KDB	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 10-28-SB2-02
Lab Sample ID: 320-66141-16
Date Collected: 10/25/20 00:55
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 92.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.46 g	10.00 mL	427878	11/02/20 18:50	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			431104	11/13/20 03:03	K1S	TAL SAC

Client Sample ID: 10-28-SB3-01
Lab Sample ID: 320-66141-17
Date Collected: 10/25/20 01:20
Matrix: Solid
Date Received: 10/29/20 10:55

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			427776	11/02/20 15:57	KDB	TAL SAC

Client Sample ID: 10-28-SB3-01
Lab Sample ID: 320-66141-17
Date Collected: 10/25/20 01:20
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 94.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.41 g	10.00 mL	427878	11/02/20 18:50	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			431104	11/13/20 03:12	K1S	TAL SAC

Client Sample ID: 10-28-SB4-02
Lab Sample ID: 320-66141-18
Date Collected: 10/25/20 03:10
Matrix: Solid
Date Received: 10/29/20 10:55

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			427776	11/02/20 15:57	KDB	TAL SAC

Client Sample ID: 10-28-SB4-02
Lab Sample ID: 320-66141-18
Date Collected: 10/25/20 03:10
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 48.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.42 g	10.00 mL	427878	11/02/20 18:50	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			431104	11/13/20 03:40	K1S	TAL SAC

Client Sample ID: 10-28-SB5-01
Lab Sample ID: 320-66141-19
Date Collected: 10/25/20 04:40
Matrix: Solid
Date Received: 10/29/20 10:55

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			427776	11/02/20 15:57	KDB	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 10-28-SB5-01
Lab Sample ID: 320-66141-19
Date Collected: 10/25/20 04:40
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 92.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.13 g	10.00 mL	427878	11/02/20 18:50	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			431104	11/13/20 03:50	K1S	TAL SAC

Client Sample ID: 10-28-SB5-02
Lab Sample ID: 320-66141-20
Date Collected: 10/25/20 04:55
Matrix: Solid
Date Received: 10/29/20 10:55

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			427776	11/02/20 15:57	KDB	TAL SAC

Client Sample ID: 10-28-SB5-02
Lab Sample ID: 320-66141-20
Date Collected: 10/25/20 04:55
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 94.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.18 g	10.00 mL	427878	11/02/20 18:50	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			431104	11/13/20 03:59	K1S	TAL SAC

Client Sample ID: 10-28-SB5-12
Lab Sample ID: 320-66141-21
Date Collected: 10/25/20 04:45
Matrix: Solid
Date Received: 10/29/20 10:55

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			427776	11/02/20 15:57	KDB	TAL SAC

Client Sample ID: 10-28-SB5-12
Lab Sample ID: 320-66141-21
Date Collected: 10/25/20 04:45
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 93.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.44 g	10.00 mL	427878	11/02/20 18:50	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			431104	11/13/20 04:09	K1S	TAL SAC

Client Sample ID: 10-28-SB6-01
Lab Sample ID: 320-66141-22
Date Collected: 10/25/20 05:10
Matrix: Solid
Date Received: 10/29/20 10:55

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			427776	11/02/20 15:57	KDB	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Client Sample ID: 10-28-SB6-01

Date Collected: 10/25/20 05:10
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66141-22

Matrix: Solid
Percent Solids: 94.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.20 g	10.00 mL	427878	11/02/20 18:50	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1			431104	11/13/20 04:18	K1S	TAL SAC

Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Laboratory: Eurofins TestAmerica, Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	01-20-21
ANAB	Dept. of Defense ELAP	L2468	01-20-21
ANAB	Dept. of Energy	L2468.01	01-20-21
ANAB	ISO/IEC 17025	L2468	01-20-21
Arizona	State	AZ0708	08-11-21
Arkansas DEQ	State	88-0691	06-17-21
California	State	2897	01-31-22
Colorado	State	CA0004	08-31-21
Connecticut	State	PH-0691	06-30-21
Florida	NELAP	E87570	06-30-21
Georgia	State	4040	01-30-21
Hawaii	State	<cert No.>	01-29-21
Illinois	NELAP	200060	03-17-21
Kansas	NELAP	E-10375	10-31-20 *
Louisiana	NELAP	01944	06-30-21
Maine	State	CA00004	04-14-22
Michigan	State	9947	08-03-23
Nevada	State	CA000442021-1	07-31-21
New Hampshire	NELAP	2997	04-18-21
New Jersey	NELAP	CA005	06-30-21
New York	NELAP	11666	04-01-21
Oregon	NELAP	4040	01-29-21
Pennsylvania	NELAP	68-01272	03-31-21
Texas	NELAP	T104704399-19-13	06-01-21
US Fish & Wildlife	US Federal Programs	58448	07-31-21
USDA	US Federal Programs	P330-18-00239	07-31-21
Utah	NELAP	CA000442019-01	02-28-21
Vermont	State	VT-4040	04-16-21
Virginia	NELAP	460278	03-14-21
Washington	State	C581	05-05-21
West Virginia (DW)	State	9930C	12-31-20
Wisconsin	State	998204680	08-31-21
Wyoming	State Program	8TMS-L	01-28-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
D 2216	Percent Moisture	ASTM	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 TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66141-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
320-66141-1	3-21-SB1-01	Solid	10/23/20 19:00	10/29/20 10:55	
320-66141-2	3-21-SB1-02	Solid	10/23/20 19:15	10/29/20 10:55	
320-66141-3	3-21-SB2-01	Solid	10/23/20 21:30	10/29/20 10:55	
320-66141-4	3-21-SB3-01	Solid	10/23/20 22:00	10/29/20 10:55	
320-66141-5	3-21-SB4-01	Solid	10/24/20 01:45	10/29/20 10:55	
320-66141-6	3-21-SB4-02	Solid	10/24/20 01:55	10/29/20 10:55	
320-66141-7	ARFF-SB1-01	Solid	10/24/20 03:35	10/29/20 10:55	
320-66141-8	ARFF-SB1-02	Solid	10/24/20 03:45	10/29/20 10:55	
320-66141-9	ARFF-SB1-03	Solid	10/24/20 04:00	10/29/20 10:55	
320-66141-10	ARFF-SB2-01	Solid	10/24/20 04:30	10/29/20 10:55	
320-66141-11	ARFF-SB2-02	Solid	10/24/20 04:45	10/29/20 10:55	
320-66141-12	ARFF-SB2-03	Solid	10/24/20 04:55	10/29/20 10:55	
320-66141-13	10-28-SB1-01	Solid	10/24/20 23:10	10/29/20 10:55	
320-66141-14	10-28-SB1-02	Solid	10/24/20 23:30	10/29/20 10:55	
320-66141-15	10-28-SB2-01	Solid	10/25/20 00:45	10/29/20 10:55	
320-66141-16	10-28-SB2-02	Solid	10/25/20 00:55	10/29/20 10:55	
320-66141-17	10-28-SB3-01	Solid	10/25/20 01:20	10/29/20 10:55	
320-66141-18	10-28-SB4-02	Solid	10/25/20 03:10	10/29/20 10:55	
320-66141-19	10-28-SB5-01	Solid	10/25/20 04:40	10/29/20 10:55	
320-66141-20	10-28-SB5-02	Solid	10/25/20 04:55	10/29/20 10:55	
320-66141-21	10-28-SB5-12	Solid	10/25/20 04:45	10/29/20 10:55	
320-66141-22	10-28-SB6-01	Solid	10/25/20 05:10	10/29/20 10:55	

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600
www.shannonwilson.com

CHAIN-OF-CUSTODY RECORD

Page 1 of 3

Laboratory Test America
Attn: David Alltucker

Analytical Methods (include preservative if used)

Turn Around Time:	Quote No:	J-Flags:
[X] Normal [ ] Rush	—	[X] Yes [ ] No
Please Specify		

320-66141 Chain of Custody

Sample Identity	Lab No.	Time	Date Sampled	PFAS x18 (537.1M list)	Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
3-21-SB1-01		10/23/20	1900	X	1	Soil
3-21-SB1-02			1915	X	1	
3-21-SB2-01			2130	X	1	
3-21-SB3-01			2200	X	1	
~~ANG-SB1-10~~			~~2310~~	(blank)		
~~ANG-SB1-01~~			~~2320~~			
~~ANG-SB1-02~~			~~2375~~			
3-21-SB4-01		10/24/20	0145	X	1	Soil
3-21-SB4-02			0155	X	1	
ARFF-SB1-01			0335	X	1	

Project Information		Sample Receipt	
Number:	105745	Total No. of Containers:	22
Name:	Name DOD#PF	COC Seals/Intact? Y/N/NA	
Contact:	MDN	Received Good Cond./Cold	
Ongoing Project?	Yes [X] No [ ]	Temp:	
Sampler:	APW/VTY/MDN	Delivery Method:	Goldstreak

Notes:

Please bill to 105745-003

Reliquished By: 1.	Reliquished By: 2.	Reliquished By: 3.
Signature: JBG Time: 1600	Signature: Time:	Signature: Time:
Printed Name: Veselina Yakimova Date: 10/27/20	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 855	Signature: Time:	Signature: Time:
Printed Name: Jennifer Sullington Date: 10/28/20	Printed Name: Date:	Printed Name: Date:
Company: ETAWSAC	Company:	Company:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

1.6°C

No. 35948

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600
www.shannonwilson.com

CHAIN-OF-CUSTODY RECORD

Laboratory Test America
Attn: David Althaecker

Turn Around Time: [X] Normal [ ] Rush — Please Specify

Quote No: —

J-Flags: [X] Yes [ ] No

Analytical Methods (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	PFAS x18 (EPA 537.1 LL (1x))	Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
ARFF-SB1-02		0345	10/24/20	X	1	Soil
ARFF-SB1-03		0400		X		
ARFF-SB2-01		0430		X		
ARFF-SB2-02		0445		X		
ARFF-SB2-03		0455		X		
10-28-SB1-01		2310		X		
10-28-SB1-02		2330		X		
10-28-SB2-01		0045	10/25/20	X		
10-28-SB2-02		0055		X		
10-28-SB3-01		0120		X		

Project Information		Sample Receipt	
Number:	105745	Total No. of Containers:	22
Name:	None DOT&PF	COC Seals/Intact? Y/N/NA	
Contact:	MDN	Received Good Cond./Cold	
Ongoing Project?	Yes [X] No [ ]	Temp:	
Sampler:	VTY/APW/MDN	Delivery Method:	Goldstreak

Notes:

Please bill to 105745-003

Reliquished By: 1.	Reliquished By: 2.	Reliquished By: 3.
Signature: [signature] Time: 1600	Signature: Time:	Signature: Time:
Printed Name: Vesela Jakimova Date: 10/27/20	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: [signature] Time: 1655	Signature: Time:	Signature: Time:
Printed Name: Jennifer Darlington Date: 10/27/20	Printed Name: Date:	Printed Name: Date:
Company: ETA WSRC	Company:	Company:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

1.6°C

No. 35922

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600
www.shannonwilson.com

CHAIN-OF-CUSTODY RECORD

Laboratory Test America
Attn: David Althacker

Turn Around Time:	Quote No: —
[X] Normal [ ] Rush	J-Flags: [X] Yes [ ] No
Please Specify	

Analytical Methods (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	PFAS 1/18 (EPA 537.1 MOD)	Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
10-28-SB4-02		0310	10/25/20	X	1	Soil
10-28-SB5-01		0440		X	1	
10-28-SB5-02		0455		X	1	
10-28-SB5-12		0445		X	1	
10-28-SB6-01		0510		X	1	
~~10-28-SB (dup)~~						
~~10-28~~						

Project Information		Sample Receipt	
Number:	105745	Total No. of Containers:	22
Name:	None Entered	COC Seals/Intact? Y/N/NA	
Contact:	MDN	Received Good Cond./Cold	
Ongoing Project?	Yes [X] No [ ]	Temp:	
Sampler:	MDN/NTY/MDN	Delivery Method:	Goldstreak

Notes:

Please bill to 105745-003

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: [signature] Time: 1600	Signature: Time:	Signature: Time:
Printed Name: Vesetina Yakimova Date: 10/27/20	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: [signature] Time: 1055	Signature: Time:	Signature: Time:
Printed Name: Jennifer Lachington Date: 10/27/20	Printed Name: Date:	Printed Name: Date:
Company: GTA USA	Company:	Company:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

1.6°C

No. 36150

Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 320-66141-1

Login Number: 66141
List Number: 1
Creator: Oropeza, Salvador

List Source: Eurofins TestAmerica, Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	Seals
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	GEL PACKS ONLY
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 <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Laboratory Data Review Checklist

Completed By:

Veselina Yakimova

Title:

Geologist

Date:

November 18, 2020

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

Eurofins TestAmerica, Sacramento

Laboratory Report Number:

320-66141-1

Laboratory Report Date:

November 16, 2020

CS Site Name:

Nome Airport PFAS

ADEC File Number:

400.38.056

Hazard Identification Number:

27154

320-66141-1

Laboratory Report Date:

November 16, 2020

CS Site Name:

Nome Airport PFAS

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☒ No☐ N/A☐ Comments:

   The ADEC certified the TestAmerica/Eurofins Laboratories West Sacramento, CA location for the analysis of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) on February 6, 2018. These compounds were included in the ADEC's Contaminated Sites Laboratory Approval 17-020.

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☐ No☐ N/A☒ Comments:

   All analyses were performed by TestAmerica Laboratories, Inc. in West Sacramento, CA.

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:

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 blank was measured within the acceptable temperature range of 0 °C to 6 °C upon arrival at the laboratory. The temperature of the sample cooler upon receipt was 1.6°C.

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☐ No☐ N/A☒ Comments:

   PFAS samples do not require preservation other than temperature control.

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CS Site Name:

Nome Airport PFAS

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes☒ No☐ N/A☐ Comments:

The sample receipt form notes 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:

There were no discrepancies noted in the sample receipt documentation.

e. Data quality or usability affected?

Comments:

Data quality and/or usability are not affected; see above.

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 case narrative notes that the recovery for perfluoroundecanoic acid (PFUnA) was outside of laboratory control limits in the matrix spike (MS) sample associated with preparation batch 320-427878. Matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Samples *3-21-SB2-01, 3-21-SB3-01, 3-21-SB4-01* and *ARFF-SB1-01* were cloudy with a light yellow hue following extraction.

Samples *10-28-SB1-01, 10-28-SB1-02, 10-28-SB2-02, 10-28-SB3-01, 10-28-SB4-02,* and *10-28-SB6-01* were observed to be yellow after final voluming.

Samples *10-28-SB1-01* and *10-28-SB3-01* were observed to be cloudy after final voluming.

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c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

No corrective actions were documented in the case narrative.

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. See section 6.c 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 reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☒ No☐ N/A☐ Comments:

The LOQ, equivalent to the TestAmerica Reporting Limit (RL), is less than the applicable DEC regulatory limits for the project.

e. Data quality or usability affected?

The data quality and/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 limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

Target analytes were not detected in the method blank samples.

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

None; target analytes were not detected 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:

No samples are affected; therefore, qualification is not required.

v. Data quality or usability affected?

Comments:

The data quality and/or usability are not affected.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes☒ No☐ N/A☐ Comments:

One LCS was reported for each of the associated preparatory batches.

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

Metals and/or inorganics were not analyzed as part of this work order.

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iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

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. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☐ No☐ N/A☒ Comments:

LCSDs were not reported for either batch. Refer to MS/MSD results for assessment of method precision.

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

NA; 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 of the data was not required; see above.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and/or usability was not affected; see above.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

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CS Site Name:

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ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

Metals and/or inorganics were not analyzed as part of 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 recovery for PFUnA in preparation batch 320-427878 exceeded the upper control limit.

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:

Sample *10-28-SB6-01* was used as a parent sample for the MS/MSD in preparation batch 320-427878.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

The elevated MS recovery for PFUnA may imply a high analytical bias in the method recovery. However, PFUnA was not detected in the associated field sample results. The non-detect results are therefore unaffected by the elevated recovery.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and/or usability are not 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:

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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:

There were no IDA recovery failures associated with this work order.

iv. Data quality or usability affected?

Comments:

The data quality and/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; 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? (If not, a comment explaining why must be entered below)

Yes☐ No☐ N/A☒ Comments:

iii. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

None; a trip blank was not submitted with this work order.

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v. Data quality or usability affected?

Comments:

The data quality and/or usability are not affected; see above.

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☒ No☐ N/A☐ Comments:

One field-duplicate sample pair was submitted with this work order.

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

The field-duplicate samples were named *10-28-SB5-02* and *10-28-SB5-12*.

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

RPD (%) = 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:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

The data quality and/or usability are not affected; see above.

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☐ N/A☒ Comments:

Reusable equipment was not utilized during the sample collection process for the samples associated with this work order.

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i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

No equipment blank was submitted with this work order.

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

N/A; see above.

iii. Data quality or usability affected?

Comments:

The data quality and/or 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:

No additional flags applied.

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

Laboratory Job ID: 320-66142-1
Client Project/Site: Nome PFT&PF

For:
Shannon & Wilson, Inc
2355 Hill Rd.
Fairbanks, Alaska 99709-5244

Attn: Marcy Nadel

Authorized for release by:
11/11/2020 1:35:18 PM

David Alltucker, Project Manager I
(916)374-4383
David.Alltucker@Eurofinset.com

Table of Contents

Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Qualifiers

LCMS

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
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.
¤	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

Job ID: 320-66142-1

Laboratory: Eurofins TestAmerica, Sacramento

Narrative

Job Narrative
320-66142-1

Receipt
The samples were received on 10/29/2020 10:55 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.6º C.

LCMS
Method 537 (modified): The matrix spike / matrix spike duplicate (MS/MSD) recoveries for Perfluoroundecanoic acid (PFUnA) inpreparation batch 320-427930 and analytical batch 320-429333 were outside control limits. Sample matrix interference are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method 537 (modified): The matrix spike duplicate (MSD) recovery for DONA of preparation batch 320-429643 and analytical batch 320-430182 is outside control limits. Sample matrix interference is 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 in the Definitions/Glossary page.

Organic Prep
Method SHAKE: The following sample was slightly yellow and cloudy after extraction: SS-02 (320-66142-5).

Method SHAKE: The following samples are yellow after final voluming: 10-28-SB7-02 (320-66142-12), 10-28-SB7-12 (320-66142-13), ARFF-SB3-01 (320-66142-14) and ARFF-SB3-02 (320-66142-15).

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: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: ANG-SB1-10 — Lab Sample ID: 320-66142-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.10	J	0.23	0.047	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.041	J	0.23	0.033	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.11	J	0.23	0.035	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.27	J	0.56	0.23	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: ANG-SB1-01 — Lab Sample ID: 320-66142-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	0.29	J	0.53	0.21	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: ANG-SB1-02 — Lab Sample ID: 320-66142-3

No Detections.

Client Sample ID: SS-01 — Lab Sample ID: 320-66142-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.096	J	0.22	0.034	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.6		0.55	0.22	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-02 — Lab Sample ID: 320-66142-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.19	J	0.22	0.046	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.070	J	0.22	0.031	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.16	J	0.22	0.093	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.084	J	0.22	0.039	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.39		0.22	0.024	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.31		0.22	0.039	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorododecanoic acid (PFDoA)	0.27		0.22	0.073	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorotridecanoic acid (PFTriA)	0.12	J	0.22	0.055	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.042	J	0.22	0.027	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.51		0.22	0.034	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	7.7		0.54	0.22	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-03 — Lab Sample ID: 320-66142-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorononanoic acid (PFNA)	0.078	J	0.21	0.038	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.040	J	0.21	0.023	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.22	J	0.53	0.21	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-04 — Lab Sample ID: 320-66142-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	0.22	J	0.55	0.22	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-05 — Lab Sample ID: 320-66142-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.036	J	0.22	0.034	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.26	J	0.55	0.22	ug/Kg	1	☼	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: SS-06 — Lab Sample ID: 320-66142-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	0.23	J	0.54	0.22	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-07 — Lab Sample ID: 320-66142-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.040	J	0.21	0.032	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.54		0.52	0.21	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: 10-28-SB7-01 — Lab Sample ID: 320-66142-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.067	J	0.21	0.045	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.25		0.21	0.033	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: 10-28-SB7-02 — Lab Sample ID: 320-66142-12

No Detections.

Client Sample ID: 10-28-SB7-12 — Lab Sample ID: 320-66142-13

No Detections.

Client Sample ID: ARFF-SB3-01 — Lab Sample ID: 320-66142-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.068	J	0.20	0.042	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.030	J	0.20	0.029	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.055	J	0.20	0.036	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.15	J	0.20	0.022	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.36		0.20	0.031	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	3.7		0.50	0.20	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: ARFF-SB3-02 — Lab Sample ID: 320-66142-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.035	J	0.22	0.032	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.63		0.22	0.034	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.28	J	0.55	0.22	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: ARFF-SB3-03 — Lab Sample ID: 320-66142-16

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.091	J	0.22	0.035	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.44	J	0.56	0.22	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: ARFF-SB3-13 — Lab Sample ID: 320-66142-17

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.10	J	0.24	0.037	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.49	J	0.60	0.24	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: ARFF-SB4-01 — Lab Sample ID: 320-66142-18

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.049	J	0.20	0.041	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.084	J	0.20	0.084	ug/Kg	1	☼	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento

Client Sample ID: ARFF-SB4-01 (Continued) — Lab Sample ID: 320-66142-18

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.098	J	0.20	0.030	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.66		0.49	0.20	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: ARFF-SB4-02 — Lab Sample ID: 320-66142-19

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.073	J	0.21	0.045	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.33		0.21	0.033	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.24	J	0.53	0.21	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: ARFF-SB4-03 — Lab Sample ID: 320-66142-20

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.11	J	0.21	0.044	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.35		0.21	0.033	ug/Kg	1	☼	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: ANG-SB1-10

Date Collected: 10/23/20 23:10
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-1

Matrix: Solid
Percent Solids: 82.3

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.10**	**J**	0.23	0.047	ug/Kg	☼	11/03/20 06:32	11/08/20 04:49	1
Perfluoroheptanoic acid (PFHpA)	**0.041**	**J**	0.23	0.033	ug/Kg	☼	11/03/20 06:32	11/08/20 04:49	1
Perfluorooctanoic acid (PFOA)	ND		0.23	0.097	ug/Kg	☼	11/03/20 06:32	11/08/20 04:49	1
Perfluorononanoic acid (PFNA)	ND		0.23	0.041	ug/Kg	☼	11/03/20 06:32	11/08/20 04:49	1
Perfluorodecanoic acid (PFDA)	ND		0.23	0.025	ug/Kg	☼	11/03/20 06:32	11/08/20 04:49	1
Perfluoroundecanoic acid (PFUnA)	ND	F1	0.23	0.041	ug/Kg	☼	11/03/20 06:32	11/08/20 04:49	1
Perfluorododecanoic acid (PFDoA)	ND		0.23	0.076	ug/Kg	☼	11/03/20 06:32	11/08/20 04:49	1
Perfluorotridecanoic acid (PFTriA)	ND		0.23	0.058	ug/Kg	☼	11/03/20 06:32	11/08/20 04:49	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.23	0.061	ug/Kg	☼	11/03/20 06:32	11/08/20 04:49	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.23	0.028	ug/Kg	☼	11/03/20 06:32	11/08/20 04:49	1
Perfluorohexanesulfonic acid (PFHxS)	**0.11**	**J**	0.23	0.035	ug/Kg	☼	11/03/20 06:32	11/08/20 04:49	1
Perfluorooctanesulfonic acid (PFOS)	**0.27**	**J**	0.56	0.23	ug/Kg	☼	11/03/20 06:32	11/08/20 04:49	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.3	0.44	ug/Kg	☼	11/03/20 06:32	11/08/20 04:49	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.3	0.42	ug/Kg	☼	11/03/20 06:32	11/08/20 04:49	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.23	0.030	ug/Kg	☼	11/03/20 06:32	11/08/20 04:49	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.28	0.12	ug/Kg	☼	11/03/20 06:32	11/08/20 04:49	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.23	0.025	ug/Kg	☼	11/03/20 06:32	11/08/20 04:49	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.23	0.020	ug/Kg	☼	11/03/20 06:32	11/08/20 04:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*95*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:49*	*1*
13C4 PFHpA	*96*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:49*	*1*
13C4 PFOA	*97*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:49*	*1*
13C5 PFNA	*92*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:49*	*1*
13C2 PFDA	*93*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:49*	*1*
13C2 PFUnA	*85*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:49*	*1*
13C2 PFDoA	*83*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:49*	*1*
13C2 PFTeDA	*86*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:49*	*1*
13C3 PFBS	*88*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:49*	*1*
18O2 PFHxS	*93*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:49*	*1*
13C4 PFOS	*89*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:49*	*1*
d3-NMeFOSAA	*90*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:49*	*1*
d5-NEtFOSAA	*75*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:49*	*1*
13C3 HFPO-DA	*88*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:49*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: ANG-SB1-01

Date Collected: 10/23/20 23:20
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-2

Matrix: Solid
Percent Solids: 88.4

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.21	0.044	ug/Kg	☼	11/03/20 06:32	11/08/20 05:17	1
Perfluoroheptanoic acid (PFHpA)	ND		0.21	0.031	ug/Kg	☼	11/03/20 06:32	11/08/20 05:17	1
Perfluorooctanoic acid (PFOA)	ND		0.21	0.091	ug/Kg	☼	11/03/20 06:32	11/08/20 05:17	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.038	ug/Kg	☼	11/03/20 06:32	11/08/20 05:17	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.023	ug/Kg	☼	11/03/20 06:32	11/08/20 05:17	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	11/03/20 06:32	11/08/20 05:17	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.071	ug/Kg	☼	11/03/20 06:32	11/08/20 05:17	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	11/03/20 06:32	11/08/20 05:17	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.057	ug/Kg	☼	11/03/20 06:32	11/08/20 05:17	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	11/03/20 06:32	11/08/20 05:17	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.21	0.033	ug/Kg	☼	11/03/20 06:32	11/08/20 05:17	1
Perfluorooctanesulfonic acid (PFOS)	**0.29**	**J**	0.53	0.21	ug/Kg	☼	11/03/20 06:32	11/08/20 05:17	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	11/03/20 06:32	11/08/20 05:17	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	11/03/20 06:32	11/08/20 05:17	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.21	0.028	ug/Kg	☼	11/03/20 06:32	11/08/20 05:17	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.26	0.12	ug/Kg	☼	11/03/20 06:32	11/08/20 05:17	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.21	0.023	ug/Kg	☼	11/03/20 06:32	11/08/20 05:17	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.21	0.019	ug/Kg	☼	11/03/20 06:32	11/08/20 05:17	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*96*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:17*	*1*
13C4 PFHpA	*97*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:17*	*1*
13C4 PFOA	*103*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:17*	*1*
13C5 PFNA	*105*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:17*	*1*
13C2 PFDA	*96*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:17*	*1*
13C2 PFUnA	*104*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:17*	*1*
13C2 PFDoA	*83*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:17*	*1*
13C2 PFTeDA	*92*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:17*	*1*
13C3 PFBS	*87*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:17*	*1*
18O2 PFHxS	*89*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:17*	*1*
13C4 PFOS	*89*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:17*	*1*
d3-NMeFOSAA	*107*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:17*	*1*
d5-NEtFOSAA	*104*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:17*	*1*
13C3 HFPO-DA	*93*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:17*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: ANG-SB1-02
Date Collected: 10/23/20 23:25
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-3
Matrix: Solid
Percent Solids: 90.7

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.21	0.044	ug/Kg	☼	11/03/20 06:32	11/08/20 05:26	1
Perfluoroheptanoic acid (PFHpA)	ND		0.21	0.031	ug/Kg	☼	11/03/20 06:32	11/08/20 05:26	1
Perfluorooctanoic acid (PFOA)	ND		0.21	0.091	ug/Kg	☼	11/03/20 06:32	11/08/20 05:26	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.038	ug/Kg	☼	11/03/20 06:32	11/08/20 05:26	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.023	ug/Kg	☼	11/03/20 06:32	11/08/20 05:26	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	11/03/20 06:32	11/08/20 05:26	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.071	ug/Kg	☼	11/03/20 06:32	11/08/20 05:26	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	11/03/20 06:32	11/08/20 05:26	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.057	ug/Kg	☼	11/03/20 06:32	11/08/20 05:26	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	11/03/20 06:32	11/08/20 05:26	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.21	0.033	ug/Kg	☼	11/03/20 06:32	11/08/20 05:26	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.53	0.21	ug/Kg	☼	11/03/20 06:32	11/08/20 05:26	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	11/03/20 06:32	11/08/20 05:26	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	11/03/20 06:32	11/08/20 05:26	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.21	0.028	ug/Kg	☼	11/03/20 06:32	11/08/20 05:26	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.26	0.12	ug/Kg	☼	11/03/20 06:32	11/08/20 05:26	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.21	0.023	ug/Kg	☼	11/03/20 06:32	11/08/20 05:26	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.21	0.019	ug/Kg	☼	11/03/20 06:32	11/08/20 05:26	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*99*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:26*	*1*
13C4 PFHpA	*95*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:26*	*1*
13C4 PFOA	*98*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:26*	*1*
13C5 PFNA	*98*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:26*	*1*
13C2 PFDA	*100*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:26*	*1*
13C2 PFUnA	*107*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:26*	*1*
13C2 PFDoA	*89*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:26*	*1*
13C2 PFTeDA	*90*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:26*	*1*
13C3 PFBS	*84*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:26*	*1*
18O2 PFHxS	*87*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:26*	*1*
13C4 PFOS	*86*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:26*	*1*
d3-NMeFOSAA	*101*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:26*	*1*
d5-NEtFOSAA	*97*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:26*	*1*
13C3 HFPO-DA	*92*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:26*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: SS-01
Date Collected: 10/27/20 11:12
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-4
Matrix: Solid
Percent Solids: 88.1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.22	0.046	ug/Kg	☼	11/03/20 06:32	11/08/20 05:36	1
Perfluoroheptanoic acid (PFHpA)	ND		0.22	0.032	ug/Kg	☼	11/03/20 06:32	11/08/20 05:36	1
Perfluorooctanoic acid (PFOA)	ND		0.22	0.095	ug/Kg	☼	11/03/20 06:32	11/08/20 05:36	1
Perfluorononanoic acid (PFNA)	ND		0.22	0.040	ug/Kg	☼	11/03/20 06:32	11/08/20 05:36	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.024	ug/Kg	☼	11/03/20 06:32	11/08/20 05:36	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.040	ug/Kg	☼	11/03/20 06:32	11/08/20 05:36	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.074	ug/Kg	☼	11/03/20 06:32	11/08/20 05:36	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.056	ug/Kg	☼	11/03/20 06:32	11/08/20 05:36	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.060	ug/Kg	☼	11/03/20 06:32	11/08/20 05:36	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.028	ug/Kg	☼	11/03/20 06:32	11/08/20 05:36	1
Perfluorohexanesulfonic acid (PFHxS)	**0.096**	**J**	0.22	0.034	ug/Kg	☼	11/03/20 06:32	11/08/20 05:36	1
Perfluorooctanesulfonic acid (PFOS)	**1.6**		0.55	0.22	ug/Kg	☼	11/03/20 06:32	11/08/20 05:36	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.43	ug/Kg	☼	11/03/20 06:32	11/08/20 05:36	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.41	ug/Kg	☼	11/03/20 06:32	11/08/20 05:36	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.22	0.030	ug/Kg	☼	11/03/20 06:32	11/08/20 05:36	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.28	0.12	ug/Kg	☼	11/03/20 06:32	11/08/20 05:36	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.22	0.024	ug/Kg	☼	11/03/20 06:32	11/08/20 05:36	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.22	0.020	ug/Kg	☼	11/03/20 06:32	11/08/20 05:36	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*91*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:36*	*1*
13C4 PFHpA	*92*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:36*	*1*
13C4 PFOA	*94*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:36*	*1*
13C5 PFNA	*90*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:36*	*1*
13C2 PFDA	*91*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:36*	*1*
13C2 PFUnA	*98*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:36*	*1*
13C2 PFDoA	*92*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:36*	*1*
13C2 PFTeDA	*86*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:36*	*1*
13C3 PFBS	*82*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:36*	*1*
18O2 PFHxS	*87*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:36*	*1*
13C4 PFOS	*82*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:36*	*1*
d3-NMeFOSAA	*97*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:36*	*1*
d5-NEtFOSAA	*81*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:36*	*1*
13C3 HFPO-DA	*86*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:36*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: SS-02
Date Collected: 10/27/20 11:35
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-5
Matrix: Solid
Percent Solids: 91.4

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.19**	**J**	0.22	0.046	ug/Kg	☼	11/03/20 06:32	11/08/20 05:45	1
Perfluoroheptanoic acid (PFHpA)	**0.070**	**J**	0.22	0.031	ug/Kg	☼	11/03/20 06:32	11/08/20 05:45	1
Perfluorooctanoic acid (PFOA)	**0.16**	**J**	0.22	0.093	ug/Kg	☼	11/03/20 06:32	11/08/20 05:45	1
Perfluorononanoic acid (PFNA)	**0.084**	**J**	0.22	0.039	ug/Kg	☼	11/03/20 06:32	11/08/20 05:45	1
Perfluorodecanoic acid (PFDA)	**0.39**		0.22	0.024	ug/Kg	☼	11/03/20 06:32	11/08/20 05:45	1
Perfluoroundecanoic acid (PFUnA)	**0.31**		0.22	0.039	ug/Kg	☼	11/03/20 06:32	11/08/20 05:45	1
Perfluorododecanoic acid (PFDoA)	**0.27**		0.22	0.073	ug/Kg	☼	11/03/20 06:32	11/08/20 05:45	1
Perfluorotridecanoic acid (PFTriA)	**0.12**	**J**	0.22	0.055	ug/Kg	☼	11/03/20 06:32	11/08/20 05:45	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.059	ug/Kg	☼	11/03/20 06:32	11/08/20 05:45	1
Perfluorobutanesulfonic acid (PFBS)	**0.042**	**J**	0.22	0.027	ug/Kg	☼	11/03/20 06:32	11/08/20 05:45	1
Perfluorohexanesulfonic acid (PFHxS)	**0.51**		0.22	0.034	ug/Kg	☼	11/03/20 06:32	11/08/20 05:45	1
Perfluorooctanesulfonic acid (PFOS)	**7.7**		0.54	0.22	ug/Kg	☼	11/03/20 06:32	11/08/20 05:45	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.42	ug/Kg	☼	11/03/20 06:32	11/08/20 05:45	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.40	ug/Kg	☼	11/03/20 06:32	11/08/20 05:45	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.22	0.029	ug/Kg	☼	11/03/20 06:32	11/08/20 05:45	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.27	0.12	ug/Kg	☼	11/03/20 06:32	11/08/20 05:45	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.22	0.024	ug/Kg	☼	11/03/20 06:32	11/08/20 05:45	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.22	0.020	ug/Kg	☼	11/03/20 06:32	11/08/20 05:45	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*94*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:45*	*1*
13C4 PFHpA	*97*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:45*	*1*
13C4 PFOA	*101*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:45*	*1*
13C5 PFNA	*101*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:45*	*1*
13C2 PFDA	*99*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:45*	*1*
13C2 PFUnA	*104*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:45*	*1*
13C2 PFDoA	*88*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:45*	*1*
13C2 PFTeDA	*74*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:45*	*1*
13C3 PFBS	*85*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:45*	*1*
18O2 PFHxS	*89*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:45*	*1*
13C4 PFOS	*89*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:45*	*1*
d3-NMeFOSAA	*106*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:45*	*1*
d5-NEtFOSAA	*97*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:45*	*1*
13C3 HFPO-DA	*88*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:45*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: SS-03
Date Collected: 10/27/20 11:55
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-6
Matrix: Solid
Percent Solids: 87.8

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.21	0.044	ug/Kg	☼	11/03/20 06:32	11/08/20 05:55	1
Perfluoroheptanoic acid (PFHpA)	ND		0.21	0.031	ug/Kg	☼	11/03/20 06:32	11/08/20 05:55	1
Perfluorooctanoic acid (PFOA)	ND		0.21	0.091	ug/Kg	☼	11/03/20 06:32	11/08/20 05:55	1
Perfluorononanoic acid (PFNA)	**0.078**	**J**	0.21	0.038	ug/Kg	☼	11/03/20 06:32	11/08/20 05:55	1
Perfluorodecanoic acid (PFDA)	**0.040**	**J**	0.21	0.023	ug/Kg	☼	11/03/20 06:32	11/08/20 05:55	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	11/03/20 06:32	11/08/20 05:55	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.071	ug/Kg	☼	11/03/20 06:32	11/08/20 05:55	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	11/03/20 06:32	11/08/20 05:55	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.057	ug/Kg	☼	11/03/20 06:32	11/08/20 05:55	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	11/03/20 06:32	11/08/20 05:55	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.21	0.033	ug/Kg	☼	11/03/20 06:32	11/08/20 05:55	1
Perfluorooctanesulfonic acid (PFOS)	**0.22**	**J**	0.53	0.21	ug/Kg	☼	11/03/20 06:32	11/08/20 05:55	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	11/03/20 06:32	11/08/20 05:55	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	11/03/20 06:32	11/08/20 05:55	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.21	0.028	ug/Kg	☼	11/03/20 06:32	11/08/20 05:55	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.26	0.12	ug/Kg	☼	11/03/20 06:32	11/08/20 05:55	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.21	0.023	ug/Kg	☼	11/03/20 06:32	11/08/20 05:55	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.21	0.019	ug/Kg	☼	11/03/20 06:32	11/08/20 05:55	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*86*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:55*	*1*
13C4 PFHpA	*96*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:55*	*1*
13C4 PFOA	*96*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:55*	*1*
13C5 PFNA	*94*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:55*	*1*
13C2 PFDA	*95*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:55*	*1*
13C2 PFUnA	*97*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:55*	*1*
13C2 PFDoA	*91*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:55*	*1*
13C2 PFTeDA	*88*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:55*	*1*
13C3 PFBS	*88*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:55*	*1*
18O2 PFHxS	*87*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:55*	*1*
13C4 PFOS	*87*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:55*	*1*
d3-NMeFOSAA	*121*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:55*	*1*
d5-NEtFOSAA	*112*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:55*	*1*
13C3 HFPO-DA	*88*		*25 - 150*	*11/03/20 06:32*	*11/08/20 05:55*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: SS-04
Date Collected: 10/27/20 12:15
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-7
Matrix: Solid
Percent Solids: 84.7

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.22	0.047	ug/Kg	☼	11/03/20 06:32	11/08/20 06:23	1
Perfluoroheptanoic acid (PFHpA)	ND		0.22	0.032	ug/Kg	☼	11/03/20 06:32	11/08/20 06:23	1
Perfluorooctanoic acid (PFOA)	ND		0.22	0.095	ug/Kg	☼	11/03/20 06:32	11/08/20 06:23	1
Perfluorononanoic acid (PFNA)	ND		0.22	0.040	ug/Kg	☼	11/03/20 06:32	11/08/20 06:23	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.024	ug/Kg	☼	11/03/20 06:32	11/08/20 06:23	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.040	ug/Kg	☼	11/03/20 06:32	11/08/20 06:23	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.074	ug/Kg	☼	11/03/20 06:32	11/08/20 06:23	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.057	ug/Kg	☼	11/03/20 06:32	11/08/20 06:23	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.060	ug/Kg	☼	11/03/20 06:32	11/08/20 06:23	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.028	ug/Kg	☼	11/03/20 06:32	11/08/20 06:23	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.22	0.034	ug/Kg	☼	11/03/20 06:32	11/08/20 06:23	1
Perfluorooctanesulfonic acid (PFOS)	**0.22**	**J**	0.55	0.22	ug/Kg	☼	11/03/20 06:32	11/08/20 06:23	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.43	ug/Kg	☼	11/03/20 06:32	11/08/20 06:23	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.41	ug/Kg	☼	11/03/20 06:32	11/08/20 06:23	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.22	0.030	ug/Kg	☼	11/03/20 06:32	11/08/20 06:23	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.28	0.12	ug/Kg	☼	11/03/20 06:32	11/08/20 06:23	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.22	0.024	ug/Kg	☼	11/03/20 06:32	11/08/20 06:23	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.22	0.020	ug/Kg	☼	11/03/20 06:32	11/08/20 06:23	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*92*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:23*	*1*
13C4 PFHpA	*96*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:23*	*1*
13C4 PFOA	*99*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:23*	*1*
13C5 PFNA	*98*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:23*	*1*
13C2 PFDA	*88*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:23*	*1*
13C2 PFUnA	*109*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:23*	*1*
13C2 PFDoA	*97*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:23*	*1*
13C2 PFTeDA	*93*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:23*	*1*
13C3 PFBS	*85*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:23*	*1*
18O2 PFHxS	*94*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:23*	*1*
13C4 PFOS	*90*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:23*	*1*
d3-NMeFOSAA	*105*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:23*	*1*
d5-NEtFOSAA	*109*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:23*	*1*
13C3 HFPO-DA	*87*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:23*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: SS-05
Date Collected: 10/27/20 12:05
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-8
Matrix: Solid
Percent Solids: 85.2

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.22	0.046	ug/Kg	☼	11/03/20 06:32	11/08/20 06:32	1
Perfluoroheptanoic acid (PFHpA)	ND		0.22	0.032	ug/Kg	☼	11/03/20 06:32	11/08/20 06:32	1
Perfluorooctanoic acid (PFOA)	ND		0.22	0.094	ug/Kg	☼	11/03/20 06:32	11/08/20 06:32	1
Perfluorononanoic acid (PFNA)	ND		0.22	0.039	ug/Kg	☼	11/03/20 06:32	11/08/20 06:32	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.024	ug/Kg	☼	11/03/20 06:32	11/08/20 06:32	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.039	ug/Kg	☼	11/03/20 06:32	11/08/20 06:32	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.073	ug/Kg	☼	11/03/20 06:32	11/08/20 06:32	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.056	ug/Kg	☼	11/03/20 06:32	11/08/20 06:32	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.059	ug/Kg	☼	11/03/20 06:32	11/08/20 06:32	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.027	ug/Kg	☼	11/03/20 06:32	11/08/20 06:32	1
Perfluorohexanesulfonic acid (PFHxS)	**0.036**	**J**	0.22	0.034	ug/Kg	☼	11/03/20 06:32	11/08/20 06:32	1
Perfluorooctanesulfonic acid (PFOS)	**0.26**	**J**	0.55	0.22	ug/Kg	☼	11/03/20 06:32	11/08/20 06:32	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.43	ug/Kg	☼	11/03/20 06:32	11/08/20 06:32	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.40	ug/Kg	☼	11/03/20 06:32	11/08/20 06:32	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.22	0.030	ug/Kg	☼	11/03/20 06:32	11/08/20 06:32	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.27	0.12	ug/Kg	☼	11/03/20 06:32	11/08/20 06:32	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.22	0.024	ug/Kg	☼	11/03/20 06:32	11/08/20 06:32	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.22	0.020	ug/Kg	☼	11/03/20 06:32	11/08/20 06:32	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*87*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:32*	*1*
13C4 PFHpA	*92*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:32*	*1*
13C4 PFOA	*95*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:32*	*1*
13C5 PFNA	*92*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:32*	*1*
13C2 PFDA	*91*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:32*	*1*
13C2 PFUnA	*91*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:32*	*1*
13C2 PFDoA	*85*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:32*	*1*
13C2 PFTeDA	*98*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:32*	*1*
13C3 PFBS	*80*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:32*	*1*
18O2 PFHxS	*87*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:32*	*1*
13C4 PFOS	*85*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:32*	*1*
d3-NMeFOSAA	*104*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:32*	*1*
d5-NEtFOSAA	*94*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:32*	*1*
13C3 HFPO-DA	*83*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:32*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: SS-06
Date Collected: 10/27/20 12:35
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-9
Matrix: Solid
Percent Solids: 88.9

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.22	0.045	ug/Kg	☼	11/03/20 06:32	11/08/20 06:42	1
Perfluoroheptanoic acid (PFHpA)	ND		0.22	0.031	ug/Kg	☼	11/03/20 06:32	11/08/20 06:42	1
Perfluorooctanoic acid (PFOA)	ND		0.22	0.093	ug/Kg	☼	11/03/20 06:32	11/08/20 06:42	1
Perfluorononanoic acid (PFNA)	ND		0.22	0.039	ug/Kg	☼	11/03/20 06:32	11/08/20 06:42	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.024	ug/Kg	☼	11/03/20 06:32	11/08/20 06:42	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.039	ug/Kg	☼	11/03/20 06:32	11/08/20 06:42	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.072	ug/Kg	☼	11/03/20 06:32	11/08/20 06:42	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.055	ug/Kg	☼	11/03/20 06:32	11/08/20 06:42	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.058	ug/Kg	☼	11/03/20 06:32	11/08/20 06:42	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.027	ug/Kg	☼	11/03/20 06:32	11/08/20 06:42	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.22	0.034	ug/Kg	☼	11/03/20 06:32	11/08/20 06:42	1
Perfluorooctanesulfonic acid (PFOS)	**0.23**	**J**	0.54	0.22	ug/Kg	☼	11/03/20 06:32	11/08/20 06:42	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.42	ug/Kg	☼	11/03/20 06:32	11/08/20 06:42	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.40	ug/Kg	☼	11/03/20 06:32	11/08/20 06:42	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.22	0.029	ug/Kg	☼	11/03/20 06:32	11/08/20 06:42	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.27	0.12	ug/Kg	☼	11/03/20 06:32	11/08/20 06:42	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.22	0.024	ug/Kg	☼	11/03/20 06:32	11/08/20 06:42	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.22	0.019	ug/Kg	☼	11/03/20 06:32	11/08/20 06:42	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*99*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:42*	*1*
13C4 PFHpA	*100*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:42*	*1*
13C4 PFOA	*100*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:42*	*1*
13C5 PFNA	*101*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:42*	*1*
13C2 PFDA	*100*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:42*	*1*
13C2 PFUnA	*98*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:42*	*1*
13C2 PFDoA	*90*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:42*	*1*
13C2 PFTeDA	*90*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:42*	*1*
13C3 PFBS	*88*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:42*	*1*
18O2 PFHxS	*90*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:42*	*1*
13C4 PFOS	*89*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:42*	*1*
d3-NMeFOSAA	*122*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:42*	*1*
d5-NEtFOSAA	*105*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:42*	*1*
13C3 HFPO-DA	*98*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:42*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: SS-07
Date Collected: 10/27/20 13:00
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-10
Matrix: Solid
Percent Solids: 91.1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.21	0.044	ug/Kg	☼	11/03/20 06:32	11/08/20 06:51	1
Perfluoroheptanoic acid (PFHpA)	ND		0.21	0.030	ug/Kg	☼	11/03/20 06:32	11/08/20 06:51	1
Perfluorooctanoic acid (PFOA)	ND		0.21	0.090	ug/Kg	☼	11/03/20 06:32	11/08/20 06:51	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.038	ug/Kg	☼	11/03/20 06:32	11/08/20 06:51	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.023	ug/Kg	☼	11/03/20 06:32	11/08/20 06:51	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	11/03/20 06:32	11/08/20 06:51	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.070	ug/Kg	☼	11/03/20 06:32	11/08/20 06:51	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.053	ug/Kg	☼	11/03/20 06:32	11/08/20 06:51	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.056	ug/Kg	☼	11/03/20 06:32	11/08/20 06:51	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	11/03/20 06:32	11/08/20 06:51	1
Perfluorohexanesulfonic acid (PFHxS)	**0.040**	**J**	0.21	0.032	ug/Kg	☼	11/03/20 06:32	11/08/20 06:51	1
Perfluorooctanesulfonic acid (PFOS)	**0.54**		0.52	0.21	ug/Kg	☼	11/03/20 06:32	11/08/20 06:51	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	11/03/20 06:32	11/08/20 06:51	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	11/03/20 06:32	11/08/20 06:51	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.21	0.028	ug/Kg	☼	11/03/20 06:32	11/08/20 06:51	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.26	0.11	ug/Kg	☼	11/03/20 06:32	11/08/20 06:51	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.21	0.023	ug/Kg	☼	11/03/20 06:32	11/08/20 06:51	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.21	0.019	ug/Kg	☼	11/03/20 06:32	11/08/20 06:51	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*98*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:51*	*1*
13C4 PFHpA	*99*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:51*	*1*
13C4 PFOA	*101*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:51*	*1*
13C5 PFNA	*97*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:51*	*1*
13C2 PFDA	*100*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:51*	*1*
13C2 PFUnA	*111*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:51*	*1*
13C2 PFDoA	*100*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:51*	*1*
13C2 PFTeDA	*94*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:51*	*1*
13C3 PFBS	*87*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:51*	*1*
18O2 PFHxS	*88*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:51*	*1*
13C4 PFOS	*90*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:51*	*1*
d3-NMeFOSAA	*112*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:51*	*1*
d5-NEtFOSAA	*103*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:51*	*1*
13C3 HFPO-DA	*93*		*25 - 150*	*11/03/20 06:32*	*11/08/20 06:51*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: 10-28-SB7-01
Date Collected: 10/26/20 00:10
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-11
Matrix: Solid
Percent Solids: 90.3

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.067**	**J**	0.21	0.045	ug/Kg	☼	11/08/20 20:08	11/10/20 18:06	1
Perfluoroheptanoic acid (PFHpA)	ND		0.21	0.031	ug/Kg	☼	11/08/20 20:08	11/10/20 18:06	1
Perfluorooctanoic acid (PFOA)	ND		0.21	0.092	ug/Kg	☼	11/08/20 20:08	11/10/20 18:06	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.039	ug/Kg	☼	11/08/20 20:08	11/10/20 18:06	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.024	ug/Kg	☼	11/08/20 20:08	11/10/20 18:06	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.039	ug/Kg	☼	11/08/20 20:08	11/10/20 18:06	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.072	ug/Kg	☼	11/08/20 20:08	11/10/20 18:06	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.055	ug/Kg	☼	11/08/20 20:08	11/10/20 18:06	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.058	ug/Kg	☼	11/08/20 20:08	11/10/20 18:06	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.027	ug/Kg	☼	11/08/20 20:08	11/10/20 18:06	1
Perfluorohexanesulfonic acid (PFHxS)	**0.25**		0.21	0.033	ug/Kg	☼	11/08/20 20:08	11/10/20 18:06	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.54	0.21	ug/Kg	☼	11/08/20 20:08	11/10/20 18:06	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.42	ug/Kg	☼	11/08/20 20:08	11/10/20 18:06	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.40	ug/Kg	☼	11/08/20 20:08	11/10/20 18:06	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.21	0.029	ug/Kg	☼	11/08/20 20:08	11/10/20 18:06	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.27	0.12	ug/Kg	☼	11/08/20 20:08	11/10/20 18:06	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.21	0.024	ug/Kg	☼	11/08/20 20:08	11/10/20 18:06	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	F1	0.21	0.019	ug/Kg	☼	11/08/20 20:08	11/10/20 18:06	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*93*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:06*	*1*
13C4 PFHpA	*97*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:06*	*1*
13C4 PFOA	*100*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:06*	*1*
13C5 PFNA	*92*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:06*	*1*
13C2 PFDA	*89*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:06*	*1*
13C2 PFUnA	*89*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:06*	*1*
13C2 PFDoA	*89*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:06*	*1*
13C2 PFTeDA	*80*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:06*	*1*
13C3 PFBS	*79*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:06*	*1*
18O2 PFHxS	*78*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:06*	*1*
13C4 PFOS	*77*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:06*	*1*
d3-NMeFOSAA	*111*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:06*	*1*
d5-NEtFOSAA	*105*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:06*	*1*
13C3 HFPO-DA	*92*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:06*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: 10-28-SB7-02
Date Collected: 10/26/20 00:25
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-12
Matrix: Solid
Percent Solids: 71.6

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.28	0.058	ug/Kg	☼	11/08/20 20:08	11/10/20 18:34	1
Perfluoroheptanoic acid (PFHpA)	ND		0.28	0.040	ug/Kg	☼	11/08/20 20:08	11/10/20 18:34	1
Perfluorooctanoic acid (PFOA)	ND		0.28	0.12	ug/Kg	☼	11/08/20 20:08	11/10/20 18:34	1
Perfluorononanoic acid (PFNA)	ND		0.28	0.050	ug/Kg	☼	11/08/20 20:08	11/10/20 18:34	1
Perfluorodecanoic acid (PFDA)	ND		0.28	0.030	ug/Kg	☼	11/08/20 20:08	11/10/20 18:34	1
Perfluoroundecanoic acid (PFUnA)	ND		0.28	0.050	ug/Kg	☼	11/08/20 20:08	11/10/20 18:34	1
Perfluorododecanoic acid (PFDoA)	ND		0.28	0.092	ug/Kg	☼	11/08/20 20:08	11/10/20 18:34	1
Perfluorotridecanoic acid (PFTriA)	ND		0.28	0.070	ug/Kg	☼	11/08/20 20:08	11/10/20 18:34	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.28	0.075	ug/Kg	☼	11/08/20 20:08	11/10/20 18:34	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.28	0.035	ug/Kg	☼	11/08/20 20:08	11/10/20 18:34	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.28	0.043	ug/Kg	☼	11/08/20 20:08	11/10/20 18:34	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.69	0.28	ug/Kg	☼	11/08/20 20:08	11/10/20 18:34	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.8	0.54	ug/Kg	☼	11/08/20 20:08	11/10/20 18:34	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.8	0.51	ug/Kg	☼	11/08/20 20:08	11/10/20 18:34	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.28	0.037	ug/Kg	☼	11/08/20 20:08	11/10/20 18:34	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.35	0.15	ug/Kg	☼	11/08/20 20:08	11/10/20 18:34	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.28	0.030	ug/Kg	☼	11/08/20 20:08	11/10/20 18:34	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.28	0.025	ug/Kg	☼	11/08/20 20:08	11/10/20 18:34	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*86*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:34*	*1*
13C4 PFHpA	*87*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:34*	*1*
13C4 PFOA	*83*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:34*	*1*
13C5 PFNA	*72*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:34*	*1*
13C2 PFDA	*71*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:34*	*1*
13C2 PFUnA	*69*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:34*	*1*
13C2 PFDoA	*63*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:34*	*1*
13C2 PFTeDA	*46*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:34*	*1*
13C3 PFBS	*84*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:34*	*1*
18O2 PFHxS	*91*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:34*	*1*
13C4 PFOS	*84*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:34*	*1*
d3-NMeFOSAA	*78*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:34*	*1*
d5-NEtFOSAA	*66*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:34*	*1*
13C3 HFPO-DA	*78*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:34*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: 10-28-SB7-12
Date Collected: 10/26/20 00:15
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-13
Matrix: Solid
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		0.26	0.055	ug/Kg	☼	11/08/20 20:08	11/10/20 18:44	1
Perfluoroheptanoic acid (PFHpA)	ND		0.26	0.038	ug/Kg	☼	11/08/20 20:08	11/10/20 18:44	1
Perfluorooctanoic acid (PFOA)	ND		0.26	0.11	ug/Kg	☼	11/08/20 20:08	11/10/20 18:44	1
Perfluorononanoic acid (PFNA)	ND		0.26	0.047	ug/Kg	☼	11/08/20 20:08	11/10/20 18:44	1
Perfluorodecanoic acid (PFDA)	ND		0.26	0.029	ug/Kg	☼	11/08/20 20:08	11/10/20 18:44	1
Perfluoroundecanoic acid (PFUnA)	ND		0.26	0.047	ug/Kg	☼	11/08/20 20:08	11/10/20 18:44	1
Perfluorododecanoic acid (PFDoA)	ND		0.26	0.088	ug/Kg	☼	11/08/20 20:08	11/10/20 18:44	1
Perfluorotridecanoic acid (PFTriA)	ND		0.26	0.067	ug/Kg	☼	11/08/20 20:08	11/10/20 18:44	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.26	0.071	ug/Kg	☼	11/08/20 20:08	11/10/20 18:44	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.26	0.033	ug/Kg	☼	11/08/20 20:08	11/10/20 18:44	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.26	0.041	ug/Kg	☼	11/08/20 20:08	11/10/20 18:44	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.66	0.26	ug/Kg	☼	11/08/20 20:08	11/10/20 18:44	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.6	0.51	ug/Kg	☼	11/08/20 20:08	11/10/20 18:44	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.6	0.49	ug/Kg	☼	11/08/20 20:08	11/10/20 18:44	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.26	0.035	ug/Kg	☼	11/08/20 20:08	11/10/20 18:44	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.33	0.14	ug/Kg	☼	11/08/20 20:08	11/10/20 18:44	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.26	0.029	ug/Kg	☼	11/08/20 20:08	11/10/20 18:44	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.26	0.024	ug/Kg	☼	11/08/20 20:08	11/10/20 18:44	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*95*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:44*	*1*
13C4 PFHpA	*96*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:44*	*1*
13C4 PFOA	*88*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:44*	*1*
13C5 PFNA	*75*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:44*	*1*
13C2 PFDA	*93*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:44*	*1*
13C2 PFUnA	*85*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:44*	*1*
13C2 PFDoA	*76*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:44*	*1*
13C2 PFTeDA	*55*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:44*	*1*
13C3 PFBS	*90*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:44*	*1*
18O2 PFHxS	*92*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:44*	*1*
13C4 PFOS	*86*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:44*	*1*
d3-NMeFOSAA	*88*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:44*	*1*
d5-NEtFOSAA	*75*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:44*	*1*
13C3 HFPO-DA	*83*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:44*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: ARFF-SB3-01
Date Collected: 10/26/20 16:25
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-14
Matrix: Solid
Percent Solids: 93.2

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.068**	**J**	0.20	0.042	ug/Kg	☼	11/08/20 20:08	11/10/20 18:53	1
Perfluoroheptanoic acid (PFHpA)	**0.030**	**J**	0.20	0.029	ug/Kg	☼	11/08/20 20:08	11/10/20 18:53	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.086	ug/Kg	☼	11/08/20 20:08	11/10/20 18:53	1
Perfluorononanoic acid (PFNA)	**0.055**	**J**	0.20	0.036	ug/Kg	☼	11/08/20 20:08	11/10/20 18:53	1
Perfluorodecanoic acid (PFDA)	**0.15**	**J**	0.20	0.022	ug/Kg	☼	11/08/20 20:08	11/10/20 18:53	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036	ug/Kg	☼	11/08/20 20:08	11/10/20 18:53	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.067	ug/Kg	☼	11/08/20 20:08	11/10/20 18:53	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051	ug/Kg	☼	11/08/20 20:08	11/10/20 18:53	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054	ug/Kg	☼	11/08/20 20:08	11/10/20 18:53	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg	☼	11/08/20 20:08	11/10/20 18:53	1
Perfluorohexanesulfonic acid (PFHxS)	**0.36**		0.20	0.031	ug/Kg	☼	11/08/20 20:08	11/10/20 18:53	1
Perfluorooctanesulfonic acid (PFOS)	**3.7**		0.50	0.20	ug/Kg	☼	11/08/20 20:08	11/10/20 18:53	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg	☼	11/08/20 20:08	11/10/20 18:53	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg	☼	11/08/20 20:08	11/10/20 18:53	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.027	ug/Kg	☼	11/08/20 20:08	11/10/20 18:53	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.25	0.11	ug/Kg	☼	11/08/20 20:08	11/10/20 18:53	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.022	ug/Kg	☼	11/08/20 20:08	11/10/20 18:53	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg	☼	11/08/20 20:08	11/10/20 18:53	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*88*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:53*	*1*
13C4 PFHpA	*92*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:53*	*1*
13C4 PFOA	*89*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:53*	*1*
13C5 PFNA	*81*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:53*	*1*
13C2 PFDA	*85*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:53*	*1*
13C2 PFUnA	*76*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:53*	*1*
13C2 PFDoA	*70*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:53*	*1*
13C2 PFTeDA	*65*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:53*	*1*
13C3 PFBS	*76*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:53*	*1*
18O2 PFHxS	*81*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:53*	*1*
13C4 PFOS	*78*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:53*	*1*
d3-NMeFOSAA	*92*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:53*	*1*
d5-NEtFOSAA	*89*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:53*	*1*
13C3 HFPO-DA	*85*		*25 - 150*	*11/08/20 20:08*	*11/10/20 18:53*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: ARFF-SB3-02
Date Collected: 10/26/20 16:35
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-15
Matrix: Solid
Percent Solids: 90.5

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.22	0.046	ug/Kg	☼	11/08/20 20:08	11/10/20 19:12	1
Perfluoroheptanoic acid (PFHpA)	**0.035**	**J**	0.22	0.032	ug/Kg	☼	11/08/20 20:08	11/10/20 19:12	1
Perfluorooctanoic acid (PFOA)	ND		0.22	0.095	ug/Kg	☼	11/08/20 20:08	11/10/20 19:12	1
Perfluorononanoic acid (PFNA)	ND		0.22	0.040	ug/Kg	☼	11/08/20 20:08	11/10/20 19:12	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.024	ug/Kg	☼	11/08/20 20:08	11/10/20 19:12	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.040	ug/Kg	☼	11/08/20 20:08	11/10/20 19:12	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.074	ug/Kg	☼	11/08/20 20:08	11/10/20 19:12	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.056	ug/Kg	☼	11/08/20 20:08	11/10/20 19:12	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.060	ug/Kg	☼	11/08/20 20:08	11/10/20 19:12	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.028	ug/Kg	☼	11/08/20 20:08	11/10/20 19:12	1
Perfluorohexanesulfonic acid (PFHxS)	**0.63**		0.22	0.034	ug/Kg	☼	11/08/20 20:08	11/10/20 19:12	1
Perfluorooctanesulfonic acid (PFOS)	**0.28**	**J**	0.55	0.22	ug/Kg	☼	11/08/20 20:08	11/10/20 19:12	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.43	ug/Kg	☼	11/08/20 20:08	11/10/20 19:12	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.41	ug/Kg	☼	11/08/20 20:08	11/10/20 19:12	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.22	0.030	ug/Kg	☼	11/08/20 20:08	11/10/20 19:12	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.28	0.12	ug/Kg	☼	11/08/20 20:08	11/10/20 19:12	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.22	0.024	ug/Kg	☼	11/08/20 20:08	11/10/20 19:12	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.22	0.020	ug/Kg	☼	11/08/20 20:08	11/10/20 19:12	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*97*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:12*	*1*
13C4 PFHpA	*102*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:12*	*1*
13C4 PFOA	*97*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:12*	*1*
13C5 PFNA	*88*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:12*	*1*
13C2 PFDA	*96*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:12*	*1*
13C2 PFUnA	*97*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:12*	*1*
13C2 PFDoA	*96*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:12*	*1*
13C2 PFTeDA	*74*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:12*	*1*
13C3 PFBS	*85*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:12*	*1*
18O2 PFHxS	*94*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:12*	*1*
13C4 PFOS	*87*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:12*	*1*
d3-NMeFOSAA	*113*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:12*	*1*
d5-NEtFOSAA	*104*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:12*	*1*
13C3 HFPO-DA	*92*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:12*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: ARFF-SB3-03
Date Collected: 10/26/20 16:50
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-16
Matrix: Solid
Percent Solids: 83.7

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.22	0.047	ug/Kg	☼	11/08/20 20:08	11/10/20 19:21	1
Perfluoroheptanoic acid (PFHpA)	ND		0.22	0.032	ug/Kg	☼	11/08/20 20:08	11/10/20 19:21	1
Perfluorooctanoic acid (PFOA)	ND		0.22	0.096	ug/Kg	☼	11/08/20 20:08	11/10/20 19:21	1
Perfluorononanoic acid (PFNA)	ND		0.22	0.040	ug/Kg	☼	11/08/20 20:08	11/10/20 19:21	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.025	ug/Kg	☼	11/08/20 20:08	11/10/20 19:21	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.040	ug/Kg	☼	11/08/20 20:08	11/10/20 19:21	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.075	ug/Kg	☼	11/08/20 20:08	11/10/20 19:21	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.057	ug/Kg	☼	11/08/20 20:08	11/10/20 19:21	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.060	ug/Kg	☼	11/08/20 20:08	11/10/20 19:21	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.028	ug/Kg	☼	11/08/20 20:08	11/10/20 19:21	1
Perfluorohexanesulfonic acid (PFHxS)	**0.091**	**J**	0.22	0.035	ug/Kg	☼	11/08/20 20:08	11/10/20 19:21	1
Perfluorooctanesulfonic acid (PFOS)	**0.44**	**J**	0.56	0.22	ug/Kg	☼	11/08/20 20:08	11/10/20 19:21	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.43	ug/Kg	☼	11/08/20 20:08	11/10/20 19:21	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.41	ug/Kg	☼	11/08/20 20:08	11/10/20 19:21	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.22	0.030	ug/Kg	☼	11/08/20 20:08	11/10/20 19:21	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.28	0.12	ug/Kg	☼	11/08/20 20:08	11/10/20 19:21	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.22	0.025	ug/Kg	☼	11/08/20 20:08	11/10/20 19:21	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.22	0.020	ug/Kg	☼	11/08/20 20:08	11/10/20 19:21	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*96*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:21*	*1*
13C4 PFHpA	*92*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:21*	*1*
13C4 PFOA	*91*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:21*	*1*
13C5 PFNA	*87*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:21*	*1*
13C2 PFDA	*86*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:21*	*1*
13C2 PFUnA	*81*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:21*	*1*
13C2 PFDoA	*86*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:21*	*1*
13C2 PFTeDA	*68*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:21*	*1*
13C3 PFBS	*86*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:21*	*1*
18O2 PFHxS	*82*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:21*	*1*
13C4 PFOS	*84*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:21*	*1*
d3-NMeFOSAA	*105*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:21*	*1*
d5-NEtFOSAA	*96*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:21*	*1*
13C3 HFPO-DA	*89*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:21*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: ARFF-SB3-13

Date Collected: 10/26/20 16:40
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-17

Matrix: Solid
Percent Solids: 83.1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.24	0.050	ug/Kg	☼	11/08/20 20:08	11/10/20 19:31	1
Perfluoroheptanoic acid (PFHpA)	ND		0.24	0.035	ug/Kg	☼	11/08/20 20:08	11/10/20 19:31	1
Perfluorooctanoic acid (PFOA)	ND		0.24	0.10	ug/Kg	☼	11/08/20 20:08	11/10/20 19:31	1
Perfluorononanoic acid (PFNA)	ND		0.24	0.043	ug/Kg	☼	11/08/20 20:08	11/10/20 19:31	1
Perfluorodecanoic acid (PFDA)	ND		0.24	0.026	ug/Kg	☼	11/08/20 20:08	11/10/20 19:31	1
Perfluoroundecanoic acid (PFUnA)	ND		0.24	0.043	ug/Kg	☼	11/08/20 20:08	11/10/20 19:31	1
Perfluorododecanoic acid (PFDoA)	ND		0.24	0.080	ug/Kg	☼	11/08/20 20:08	11/10/20 19:31	1
Perfluorotridecanoic acid (PFTriA)	ND		0.24	0.061	ug/Kg	☼	11/08/20 20:08	11/10/20 19:31	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.24	0.065	ug/Kg	☼	11/08/20 20:08	11/10/20 19:31	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.24	0.030	ug/Kg	☼	11/08/20 20:08	11/10/20 19:31	1
Perfluorohexanesulfonic acid (PFHxS)	**0.10**	**J**	0.24	0.037	ug/Kg	☼	11/08/20 20:08	11/10/20 19:31	1
Perfluorooctanesulfonic acid (PFOS)	**0.49**	**J**	0.60	0.24	ug/Kg	☼	11/08/20 20:08	11/10/20 19:31	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.4	0.47	ug/Kg	☼	11/08/20 20:08	11/10/20 19:31	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.4	0.44	ug/Kg	☼	11/08/20 20:08	11/10/20 19:31	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.24	0.032	ug/Kg	☼	11/08/20 20:08	11/10/20 19:31	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.30	0.13	ug/Kg	☼	11/08/20 20:08	11/10/20 19:31	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.24	0.026	ug/Kg	☼	11/08/20 20:08	11/10/20 19:31	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.24	0.022	ug/Kg	☼	11/08/20 20:08	11/10/20 19:31	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*100*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:31*	*1*
13C4 PFHpA	*99*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:31*	*1*
13C4 PFOA	*96*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:31*	*1*
13C5 PFNA	*92*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:31*	*1*
13C2 PFDA	*83*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:31*	*1*
13C2 PFUnA	*86*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:31*	*1*
13C2 PFDoA	*88*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:31*	*1*
13C2 PFTeDA	*80*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:31*	*1*
13C3 PFBS	*89*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:31*	*1*
18O2 PFHxS	*88*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:31*	*1*
13C4 PFOS	*91*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:31*	*1*
d3-NMeFOSAA	*117*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:31*	*1*
d5-NEtFOSAA	*112*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:31*	*1*
13C3 HFPO-DA	*92*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:31*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: ARFF-SB4-01

Date Collected: 10/26/20 19:15
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-18

Matrix: Solid
Percent Solids: 95.0

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	0.041	ug/Kg	☼	11/08/20 20:08	11/10/20 19:40	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.028	ug/Kg	☼	11/08/20 20:08	11/10/20 19:40	1
Perfluorooctanoic acid (PFOA)	**0.084**	**J**	0.20	0.084	ug/Kg	☼	11/08/20 20:08	11/10/20 19:40	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.035	ug/Kg	☼	11/08/20 20:08	11/10/20 19:40	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg	☼	11/08/20 20:08	11/10/20 19:40	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.035	ug/Kg	☼	11/08/20 20:08	11/10/20 19:40	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.066	ug/Kg	☼	11/08/20 20:08	11/10/20 19:40	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.050	ug/Kg	☼	11/08/20 20:08	11/10/20 19:40	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.053	ug/Kg	☼	11/08/20 20:08	11/10/20 19:40	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.024	ug/Kg	☼	11/08/20 20:08	11/10/20 19:40	1
Perfluorohexanesulfonic acid (PFHxS)	**0.098**	**J**	0.20	0.030	ug/Kg	☼	11/08/20 20:08	11/10/20 19:40	1
Perfluorooctanesulfonic acid (PFOS)	**0.66**		0.49	0.20	ug/Kg	☼	11/08/20 20:08	11/10/20 19:40	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.38	ug/Kg	☼	11/08/20 20:08	11/10/20 19:40	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.36	ug/Kg	☼	11/08/20 20:08	11/10/20 19:40	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.026	ug/Kg	☼	11/08/20 20:08	11/10/20 19:40	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.24	0.11	ug/Kg	☼	11/08/20 20:08	11/10/20 19:40	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.022	ug/Kg	☼	11/08/20 20:08	11/10/20 19:40	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg	☼	11/08/20 20:08	11/10/20 19:40	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*97*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:40*	*1*
13C4 PFHpA	*102*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:40*	*1*
13C4 PFOA	*95*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:40*	*1*
13C5 PFNA	*94*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:40*	*1*
13C2 PFDA	*104*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:40*	*1*
13C2 PFUnA	*105*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:40*	*1*
13C2 PFDoA	*97*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:40*	*1*
13C2 PFTeDA	*84*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:40*	*1*
13C3 PFBS	*83*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:40*	*1*
18O2 PFHxS	*90*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:40*	*1*
13C4 PFOS	*88*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:40*	*1*
d3-NMeFOSAA	*111*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:40*	*1*
d5-NEtFOSAA	*115*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:40*	*1*
13C3 HFPO-DA	*95*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:40*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: ARFF-SB4-02
Date Collected: 10/26/20 19:25
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-19
Matrix: Solid
Percent Solids: 94.0

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.073**	**J**	0.21	0.045	ug/Kg	☼	11/08/20 20:08	11/10/20 19:49	1
Perfluoroheptanoic acid (PFHpA)	ND		0.21	0.031	ug/Kg	☼	11/08/20 20:08	11/10/20 19:49	1
Perfluorooctanoic acid (PFOA)	ND		0.21	0.091	ug/Kg	☼	11/08/20 20:08	11/10/20 19:49	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.038	ug/Kg	☼	11/08/20 20:08	11/10/20 19:49	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.023	ug/Kg	☼	11/08/20 20:08	11/10/20 19:49	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	11/08/20 20:08	11/10/20 19:49	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.071	ug/Kg	☼	11/08/20 20:08	11/10/20 19:49	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	11/08/20 20:08	11/10/20 19:49	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.057	ug/Kg	☼	11/08/20 20:08	11/10/20 19:49	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.027	ug/Kg	☼	11/08/20 20:08	11/10/20 19:49	1
Perfluorohexanesulfonic acid (PFHxS)	**0.33**		0.21	0.033	ug/Kg	☼	11/08/20 20:08	11/10/20 19:49	1
Perfluorooctanesulfonic acid (PFOS)	**0.24**	**J**	0.53	0.21	ug/Kg	☼	11/08/20 20:08	11/10/20 19:49	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	11/08/20 20:08	11/10/20 19:49	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	11/08/20 20:08	11/10/20 19:49	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.21	0.029	ug/Kg	☼	11/08/20 20:08	11/10/20 19:49	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.27	0.12	ug/Kg	☼	11/08/20 20:08	11/10/20 19:49	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.21	0.023	ug/Kg	☼	11/08/20 20:08	11/10/20 19:49	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.21	0.019	ug/Kg	☼	11/08/20 20:08	11/10/20 19:49	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*101*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:49*	*1*
13C4 PFHpA	*104*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:49*	*1*
13C4 PFOA	*99*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:49*	*1*
13C5 PFNA	*94*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:49*	*1*
13C2 PFDA	*94*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:49*	*1*
13C2 PFUnA	*89*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:49*	*1*
13C2 PFDoA	*105*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:49*	*1*
13C2 PFTeDA	*83*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:49*	*1*
13C3 PFBS	*81*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:49*	*1*
18O2 PFHxS	*88*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:49*	*1*
13C4 PFOS	*83*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:49*	*1*
d3-NMeFOSAA	*110*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:49*	*1*
d5-NEtFOSAA	*108*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:49*	*1*
13C3 HFPO-DA	*97*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:49*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: ARFF-SB4-03
Date Collected: 10/26/20 19:45
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-20
Matrix: Solid
Percent Solids: 90.8

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.11**	**J**	0.21	0.044	ug/Kg	☼	11/08/20 20:08	11/10/20 19:59	1
Perfluoroheptanoic acid (PFHpA)	ND		0.21	0.031	ug/Kg	☼	11/08/20 20:08	11/10/20 19:59	1
Perfluorooctanoic acid (PFOA)	ND		0.21	0.091	ug/Kg	☼	11/08/20 20:08	11/10/20 19:59	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.038	ug/Kg	☼	11/08/20 20:08	11/10/20 19:59	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.023	ug/Kg	☼	11/08/20 20:08	11/10/20 19:59	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	11/08/20 20:08	11/10/20 19:59	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.071	ug/Kg	☼	11/08/20 20:08	11/10/20 19:59	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	11/08/20 20:08	11/10/20 19:59	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.057	ug/Kg	☼	11/08/20 20:08	11/10/20 19:59	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	11/08/20 20:08	11/10/20 19:59	1
Perfluorohexanesulfonic acid (PFHxS)	**0.35**		0.21	0.033	ug/Kg	☼	11/08/20 20:08	11/10/20 19:59	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.53	0.21	ug/Kg	☼	11/08/20 20:08	11/10/20 19:59	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	11/08/20 20:08	11/10/20 19:59	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	11/08/20 20:08	11/10/20 19:59	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.21	0.029	ug/Kg	☼	11/08/20 20:08	11/10/20 19:59	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.26	0.12	ug/Kg	☼	11/08/20 20:08	11/10/20 19:59	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.21	0.023	ug/Kg	☼	11/08/20 20:08	11/10/20 19:59	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.21	0.019	ug/Kg	☼	11/08/20 20:08	11/10/20 19:59	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*94*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:59*	*1*
13C4 PFHpA	*95*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:59*	*1*
13C4 PFOA	*100*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:59*	*1*
13C5 PFNA	*93*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:59*	*1*
13C2 PFDA	*88*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:59*	*1*
13C2 PFUnA	*99*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:59*	*1*
13C2 PFDoA	*89*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:59*	*1*
13C2 PFTeDA	*89*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:59*	*1*
13C3 PFBS	*87*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:59*	*1*
18O2 PFHxS	*88*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:59*	*1*
13C4 PFOS	*88*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:59*	*1*
d3-NMeFOSAA	*111*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:59*	*1*
d5-NEtFOSAA	*105*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:59*	*1*
13C3 HFPO-DA	*92*		*25 - 150*	*11/08/20 20:08*	*11/10/20 19:59*	*1*

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

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)	PFDoA (25-150)	PFTDA (25-150)
320-66142-1	ANG-SB1-10	95	96	97	92	93	85	83	86
320-66142-1 MS	ANG-SB1-10	98	96	101	97	92	105	86	92
320-66142-1 MSD	ANG-SB1-10	93	92	96	91	90	89	88	73
320-66142-2	ANG-SB1-01	96	97	103	105	96	104	83	92
320-66142-3	ANG-SB1-02	99	95	98	98	100	107	89	90
320-66142-4	SS-01	91	92	94	90	91	98	92	86
320-66142-5	SS-02	94	97	101	101	99	104	88	74
320-66142-6	SS-03	86	96	96	94	95	97	91	88
320-66142-7	SS-04	92	96	99	98	88	109	97	93
320-66142-8	SS-05	87	92	95	92	91	91	85	98
320-66142-9	SS-06	99	100	100	101	100	98	90	90
320-66142-10	SS-07	98	99	101	97	100	111	100	94
320-66142-11	10-28-SB7-01	93	97	100	92	89	89	89	80
320-66142-11 MS	10-28-SB7-01	95	95	100	90	99	90	89	82
320-66142-11 MSD	10-28-SB7-01	93	95	94	91	91	95	81	84
320-66142-12	10-28-SB7-02	86	87	83	72	71	69	63	46
320-66142-13	10-28-SB7-12	95	96	88	75	93	85	76	55
320-66142-14	ARFF-SB3-01	88	92	89	81	85	76	70	65
320-66142-15	ARFF-SB3-02	97	102	97	88	96	97	96	74
320-66142-16	ARFF-SB3-03	96	92	91	87	86	81	86	68
320-66142-17	ARFF-SB3-13	100	99	96	92	83	86	88	80
320-66142-18	ARFF-SB4-01	97	102	95	94	104	105	97	84
320-66142-19	ARFF-SB4-02	101	104	99	94	94	89	105	83
320-66142-20	ARFF-SB4-03	94	95	100	93	88	99	89	89
LCS 320-427930/2-A	Lab Control Sample	91	96	98	98	90	93	85	101
LCS 320-429643/2-A	Lab Control Sample	95	98	96	94	89	81	94	81
MB 320-427930/1-A	Method Blank	95	107	104	103	94	105	98	92
MB 320-429643/1-A	Method Blank	101	100	102	101	91	100	94	87

		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)		
320-66142-1	ANG-SB1-10	88	93	89	90	75	88		
320-66142-1 MS	ANG-SB1-10	89	93	96	93	94	92		
320-66142-1 MSD	ANG-SB1-10	84	90	89	91	78	88		
320-66142-2	ANG-SB1-01	87	89	89	107	104	93		
320-66142-3	ANG-SB1-02	84	87	86	101	97	92		
320-66142-4	SS-01	82	87	82	97	81	86		
320-66142-5	SS-02	85	89	89	106	97	88		
320-66142-6	SS-03	88	87	87	121	112	88		
320-66142-7	SS-04	85	94	90	105	109	87		
320-66142-8	SS-05	80	87	85	104	94	83		
320-66142-9	SS-06	88	90	89	122	105	98		
320-66142-10	SS-07	87	88	90	112	103	93		
320-66142-11	10-28-SB7-01	79	78	77	111	105	92		
320-66142-11 MS	10-28-SB7-01	75	80	80	109	98	92		
320-66142-11 MSD	10-28-SB7-01	72	78	75	107	104	94		
320-66142-12	10-28-SB7-02	84	91	84	78	66	78		
320-66142-13	10-28-SB7-12	90	92	86	88	75	83		
320-66142-14	ARFF-SB3-01	76	81	78	92	89	85		

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

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	C3PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	d3NMFOS (25-150)	d5NEFOS (25-150)	HFPODA (25-150)		
320-66142-15	ARFF-SB3-02	85	94	87	113	104	92		
320-66142-16	ARFF-SB3-03	86	82	84	105	96	89		
320-66142-17	ARFF-SB3-13	89	88	91	117	112	92		
320-66142-18	ARFF-SB4-01	83	90	88	111	115	95		
320-66142-19	ARFF-SB4-02	81	88	83	110	108	97		
320-66142-20	ARFF-SB4-03	87	88	88	111	105	92		
LCS 320-427930/2-A	Lab Control Sample	90	93	93	105	112	94		
LCS 320-429643/2-A	Lab Control Sample	92	95	94	102	102	96		
MB 320-427930/1-A	Method Blank	95	99	100	116	111	99		
MB 320-429643/1-A	Method Blank	95	100	96	102	109	98		

Surrogate Legend

PFHxA = 13C2 PFHxA
C4PFHA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA
PFUnA = 13C2 PFUnA
PFDoA = 13C2 PFDoA
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

Lab Sample ID: MB 320-427930/1-A
Matrix: Solid
Analysis Batch: 429333

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 427930

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.042	ug/Kg		11/03/20 06:32	11/08/20 04:30	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.029	ug/Kg		11/03/20 06:32	11/08/20 04:30	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.086	ug/Kg		11/03/20 06:32	11/08/20 04:30	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.036	ug/Kg		11/03/20 06:32	11/08/20 04:30	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg		11/03/20 06:32	11/08/20 04:30	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036	ug/Kg		11/03/20 06:32	11/08/20 04:30	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.067	ug/Kg		11/03/20 06:32	11/08/20 04:30	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051	ug/Kg		11/03/20 06:32	11/08/20 04:30	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054	ug/Kg		11/03/20 06:32	11/08/20 04:30	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg		11/03/20 06:32	11/08/20 04:30	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.031	ug/Kg		11/03/20 06:32	11/08/20 04:30	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.50	0.20	ug/Kg		11/03/20 06:32	11/08/20 04:30	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg		11/03/20 06:32	11/08/20 04:30	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg		11/03/20 06:32	11/08/20 04:30	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.027	ug/Kg		11/03/20 06:32	11/08/20 04:30	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.25	0.11	ug/Kg		11/03/20 06:32	11/08/20 04:30	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.022	ug/Kg		11/03/20 06:32	11/08/20 04:30	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg		11/03/20 06:32	11/08/20 04:30	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*95*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:30*	*1*
13C4 PFHpA	*107*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:30*	*1*
13C4 PFOA	*104*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:30*	*1*
13C5 PFNA	*103*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:30*	*1*
13C2 PFDA	*94*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:30*	*1*
13C2 PFUnA	*105*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:30*	*1*
13C2 PFDoA	*98*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:30*	*1*
13C2 PFTeDA	*92*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:30*	*1*
13C3 PFBS	*95*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:30*	*1*
18O2 PFHxS	*99*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:30*	*1*
13C4 PFOS	*100*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:30*	*1*
d3-NMeFOSAA	*116*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:30*	*1*
d5-NEtFOSAA	*111*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:30*	*1*
13C3 HFPO-DA	*99*		*25 - 150*	*11/03/20 06:32*	*11/08/20 04:30*	*1*

Lab Sample ID: LCS 320-427930/2-A
Matrix: Solid
Analysis Batch: 429333

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 427930

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	2.00	1.99		ug/Kg		99	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	2.09		ug/Kg		104	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	1.89		ug/Kg		94	72 - 132
Perfluorononanoic acid (PFNA)	2.00	1.98		ug/Kg		99	73 - 133

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-427930/2-A
Matrix: Solid
Analysis Batch: 429333

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 427930

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorodecanoic acid (PFDA)	2.00	2.00		ug/Kg		100	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	1.95		ug/Kg		98	66 - 126
Perfluorododecanoic acid (PFDoA)	2.00	2.31		ug/Kg		115	71 - 131
Perfluorotridecanoic acid (PFTriA)	2.00	2.42		ug/Kg		121	71 - 131
Perfluorotetradecanoic acid (PFTeA)	2.00	2.11		ug/Kg		105	67 - 127
Perfluorobutanesulfonic acid (PFBS)	1.77	1.78		ug/Kg		101	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.75		ug/Kg		96	62 - 122
Perfluorooctanesulfonic acid (PFOS)	1.86	1.91		ug/Kg		103	68 - 141
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	1.86	1.97		ug/Kg		106	74 - 134
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	2.00	1.96		ug/Kg		98	53 - 158
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	1.88	2.03		ug/Kg		108	66 - 136
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.88	2.06		ug/Kg		110	79 - 139

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*91*		*25 - 150*
13C4 PFHpA	*96*		*25 - 150*
13C4 PFOA	*98*		*25 - 150*
13C5 PFNA	*98*		*25 - 150*
13C2 PFDA	*90*		*25 - 150*
13C2 PFUnA	*93*		*25 - 150*
13C2 PFDoA	*85*		*25 - 150*
13C2 PFTeDA	*101*		*25 - 150*
13C3 PFBS	*90*		*25 - 150*
18O2 PFHxS	*93*		*25 - 150*
13C4 PFOS	*93*		*25 - 150*
d3-NMeFOSAA	*105*		*25 - 150*
d5-NEtFOSAA	*112*		*25 - 150*
13C3 HFPO-DA	*94*		*25 - 150*

Lab Sample ID: 320-66142-1 MS
Matrix: Solid
Analysis Batch: 429333

Client Sample ID: ANG-SB1-10
Prep Type: Total/NA
Prep Batch: 427930

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	0.10	J	2.42	2.64		ug/Kg	☼	105	71 - 131
Perfluoroheptanoic acid (PFHpA)	0.041	J	2.42	2.62		ug/Kg	☼	106	71 - 131
Perfluorooctanoic acid (PFOA)	ND		2.42	2.26		ug/Kg	☼	93	72 - 132
Perfluorononanoic acid (PFNA)	ND		2.42	2.46		ug/Kg	☼	101	73 - 133
Perfluorodecanoic acid (PFDA)	ND		2.42	2.45		ug/Kg	☼	101	72 - 132
Perfluoroundecanoic acid (PFUnA)	ND	F1	2.42	3.09	F1	ug/Kg	☼	127	66 - 126

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-66142-1 MS
Matrix: Solid
Analysis Batch: 429333

Client Sample ID: ANG-SB1-10
Prep Type: Total/NA
Prep Batch: 427930

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorododecanoic acid (PFDoA)	ND		2.42	2.98		ug/Kg	☼	123	71 - 131
Perfluorotridecanoic acid (PFTriA)	ND		2.42	2.50		ug/Kg	☼	103	71 - 131
Perfluorotetradecanoic acid (PFTeA)	ND		2.42	2.27		ug/Kg	☼	94	67 - 127
Perfluorobutanesulfonic acid (PFBS)	ND		2.14	2.21		ug/Kg	☼	103	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	0.11	J	2.21	2.21		ug/Kg	☼	95	62 - 122
Perfluorooctanesulfonic acid (PFOS)	0.27	J	2.25	2.61		ug/Kg	☼	104	68 - 141
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.26	2.75		ug/Kg	☼	122	74 - 134
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		2.42	2.67		ug/Kg	☼	110	53 - 158
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.28	2.80		ug/Kg	☼	123	66 - 136
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.28	2.46		ug/Kg	☼	108	79 - 139

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C2 PFHxA	*98*		*25 - 150*
13C4 PFHpA	*96*		*25 - 150*
13C4 PFOA	*101*		*25 - 150*
13C5 PFNA	*97*		*25 - 150*
13C2 PFDA	*92*		*25 - 150*
13C2 PFUnA	*105*		*25 - 150*
13C2 PFDoA	*86*		*25 - 150*
13C2 PFTeDA	*92*		*25 - 150*
13C3 PFBS	*89*		*25 - 150*
18O2 PFHxS	*93*		*25 - 150*
13C4 PFOS	*96*		*25 - 150*
d3-NMeFOSAA	*93*		*25 - 150*
d5-NEtFOSAA	*94*		*25 - 150*
13C3 HFPO-DA	*92*		*25 - 150*

Lab Sample ID: 320-66142-1 MSD
Matrix: Solid
Analysis Batch: 429333

Client Sample ID: ANG-SB1-10
Prep Type: Total/NA
Prep Batch: 427930

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	0.10	J	2.35	2.54		ug/Kg	☼	104	71 - 131	4	30
Perfluoroheptanoic acid (PFHpA)	0.041	J	2.35	2.54		ug/Kg	☼	106	71 - 131	3	30
Perfluorooctanoic acid (PFOA)	ND		2.35	2.11		ug/Kg	☼	90	72 - 132	7	30
Perfluorononanoic acid (PFNA)	ND		2.35	2.45		ug/Kg	☼	104	73 - 133	0	30
Perfluorodecanoic acid (PFDA)	ND		2.35	2.49		ug/Kg	☼	106	72 - 132	2	30
Perfluoroundecanoic acid (PFUnA)	ND	F1	2.35	2.97	F1	ug/Kg	☼	127	66 - 126	4	30
Perfluorododecanoic acid (PFDoA)	ND		2.35	2.37		ug/Kg	☼	101	71 - 131	23	30

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-66142-1 MSD
Matrix: Solid
Analysis Batch: 429333

Client Sample ID: ANG-SB1-10
Prep Type: Total/NA
Prep Batch: 427930

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorotridecanoic acid (PFTriA)	ND		2.35	2.17		ug/Kg	☼	92	71 - 131	14	30
Perfluorotetradecanoic acid (PFTeA)	ND		2.35	2.67		ug/Kg	☼	114	67 - 127	16	30
Perfluorobutanesulfonic acid (PFBS)	ND		2.08	2.15		ug/Kg	☼	104	69 - 129	3	30
Perfluorohexanesulfonic acid (PFHxS)	0.11	J	2.14	2.35		ug/Kg	☼	104	62 - 122	6	30
Perfluorooctanesulfonic acid (PFOS)	0.27	J	2.18	2.61		ug/Kg	☼	107	68 - 141	0	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.19	2.82		ug/Kg	☼	129	74 - 134	2	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		2.35	2.52		ug/Kg	☼	107	53 - 158	6	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.21	2.72		ug/Kg	☼	123	66 - 136	3	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.21	2.38		ug/Kg	☼	108	79 - 139	3	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C2 PFHxA	*93*		*25 - 150*
13C4 PFHpA	*92*		*25 - 150*
13C4 PFOA	*96*		*25 - 150*
13C5 PFNA	*91*		*25 - 150*
13C2 PFDA	*90*		*25 - 150*
13C2 PFUnA	*89*		*25 - 150*
13C2 PFDoA	*88*		*25 - 150*
13C2 PFTeDA	*73*		*25 - 150*
13C3 PFBS	*84*		*25 - 150*
18O2 PFHxS	*90*		*25 - 150*
13C4 PFOS	*89*		*25 - 150*
d3-NMeFOSAA	*91*		*25 - 150*
d5-NEtFOSAA	*78*		*25 - 150*
13C3 HFPO-DA	*88*		*25 - 150*

Lab Sample ID: MB 320-429643/1-A
Matrix: Solid
Analysis Batch: 430182

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 429643

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.042	ug/Kg		11/08/20 20:08	11/10/20 17:28	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.029	ug/Kg		11/08/20 20:08	11/10/20 17:28	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.086	ug/Kg		11/08/20 20:08	11/10/20 17:28	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.036	ug/Kg		11/08/20 20:08	11/10/20 17:28	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg		11/08/20 20:08	11/10/20 17:28	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036	ug/Kg		11/08/20 20:08	11/10/20 17:28	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.067	ug/Kg		11/08/20 20:08	11/10/20 17:28	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051	ug/Kg		11/08/20 20:08	11/10/20 17:28	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054	ug/Kg		11/08/20 20:08	11/10/20 17:28	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg		11/08/20 20:08	11/10/20 17:28	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.031	ug/Kg		11/08/20 20:08	11/10/20 17:28	1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-429643/1-A
Matrix: Solid
Analysis Batch: 430182

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 429643

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	ND		0.50	0.20	ug/Kg		11/08/20 20:08	11/10/20 17:28	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg		11/08/20 20:08	11/10/20 17:28	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg		11/08/20 20:08	11/10/20 17:28	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.027	ug/Kg		11/08/20 20:08	11/10/20 17:28	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.25	0.11	ug/Kg		11/08/20 20:08	11/10/20 17:28	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.022	ug/Kg		11/08/20 20:08	11/10/20 17:28	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg		11/08/20 20:08	11/10/20 17:28	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*101*		*25 - 150*	*11/08/20 20:08*	*11/10/20 17:28*	*1*
13C4 PFHpA	*100*		*25 - 150*	*11/08/20 20:08*	*11/10/20 17:28*	*1*
13C4 PFOA	*102*		*25 - 150*	*11/08/20 20:08*	*11/10/20 17:28*	*1*
13C5 PFNA	*101*		*25 - 150*	*11/08/20 20:08*	*11/10/20 17:28*	*1*
13C2 PFDA	*91*		*25 - 150*	*11/08/20 20:08*	*11/10/20 17:28*	*1*
13C2 PFUnA	*100*		*25 - 150*	*11/08/20 20:08*	*11/10/20 17:28*	*1*
13C2 PFDoA	*94*		*25 - 150*	*11/08/20 20:08*	*11/10/20 17:28*	*1*
13C2 PFTeDA	*87*		*25 - 150*	*11/08/20 20:08*	*11/10/20 17:28*	*1*
13C3 PFBS	*95*		*25 - 150*	*11/08/20 20:08*	*11/10/20 17:28*	*1*
18O2 PFHxS	*100*		*25 - 150*	*11/08/20 20:08*	*11/10/20 17:28*	*1*
13C4 PFOS	*96*		*25 - 150*	*11/08/20 20:08*	*11/10/20 17:28*	*1*
d3-NMeFOSAA	*102*		*25 - 150*	*11/08/20 20:08*	*11/10/20 17:28*	*1*
d5-NEtFOSAA	*109*		*25 - 150*	*11/08/20 20:08*	*11/10/20 17:28*	*1*
13C3 HFPO-DA	*98*		*25 - 150*	*11/08/20 20:08*	*11/10/20 17:28*	*1*

Lab Sample ID: LCS 320-429643/2-A
Matrix: Solid
Analysis Batch: 430182

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 429643

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	2.00	2.11		ug/Kg		106	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	2.10		ug/Kg		105	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	1.91		ug/Kg		96	72 - 132
Perfluorononanoic acid (PFNA)	2.00	2.18		ug/Kg		109	73 - 133
Perfluorodecanoic acid (PFDA)	2.00	2.17		ug/Kg		109	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	2.09		ug/Kg		105	66 - 126
Perfluorododecanoic acid (PFDoA)	2.00	1.88		ug/Kg		94	71 - 131
Perfluorotridecanoic acid (PFTriA)	2.00	2.10		ug/Kg		105	71 - 131
Perfluorotetradecanoic acid (PFTeA)	2.00	2.20		ug/Kg		110	67 - 127
Perfluorobutanesulfonic acid (PFBS)	1.77	1.87		ug/Kg		106	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.81		ug/Kg		100	62 - 122

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-429643/2-A
Matrix: Solid
Analysis Batch: 430182

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 429643

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	1.86	2.18		ug/Kg		118	68 - 141
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	1.86	2.08		ug/Kg		112	74 - 134
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	2.00	2.00		ug/Kg		100	53 - 158
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	1.88	1.97		ug/Kg		104	66 - 136
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.88	2.23		ug/Kg		118	79 - 139

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*95*		*25 - 150*
13C4 PFHpA	*98*		*25 - 150*
13C4 PFOA	*96*		*25 - 150*
13C5 PFNA	*94*		*25 - 150*
13C2 PFDA	*89*		*25 - 150*
13C2 PFUnA	*81*		*25 - 150*
13C2 PFDoA	*94*		*25 - 150*
13C2 PFTeDA	*81*		*25 - 150*
13C3 PFBS	*92*		*25 - 150*
18O2 PFHxS	*95*		*25 - 150*
13C4 PFOS	*94*		*25 - 150*
d3-NMeFOSAA	*102*		*25 - 150*
d5-NEtFOSAA	*102*		*25 - 150*
13C3 HFPO-DA	*96*		*25 - 150*

Lab Sample ID: 320-66142-11 MS
Matrix: Solid
Analysis Batch: 430182

Client Sample ID: 10-28-SB7-01
Prep Type: Total/NA
Prep Batch: 429643

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	0.067	J	2.15	2.39		ug/Kg	☼	108	71 - 131
Perfluoroheptanoic acid (PFHpA)	ND		2.15	2.34		ug/Kg	☼	109	71 - 131
Perfluorooctanoic acid (PFOA)	ND		2.15	2.05		ug/Kg	☼	95	72 - 132
Perfluorononanoic acid (PFNA)	ND		2.15	2.34		ug/Kg	☼	109	73 - 133
Perfluorodecanoic acid (PFDA)	ND		2.15	2.25		ug/Kg	☼	104	72 - 132
Perfluoroundecanoic acid (PFUnA)	ND		2.15	2.55		ug/Kg	☼	119	66 - 126
Perfluorododecanoic acid (PFDoA)	ND		2.15	1.94		ug/Kg	☼	90	71 - 131
Perfluorotridecanoic acid (PFTriA)	ND		2.15	2.39		ug/Kg	☼	111	71 - 131
Perfluorotetradecanoic acid (PFTeA)	ND		2.15	2.48		ug/Kg	☼	115	67 - 127
Perfluorobutanesulfonic acid (PFBS)	ND		1.90	2.02		ug/Kg	☼	106	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	0.25		1.96	2.29		ug/Kg	☼	104	62 - 122
Perfluorooctanesulfonic acid (PFOS)	ND		2.00	2.45		ug/Kg	☼	123	68 - 141

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-66142-11 MS
Matrix: Solid
Analysis Batch: 430182

Client Sample ID: 10-28-SB7-01
Prep Type: Total/NA
Prep Batch: 429643

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.01	2.43		ug/Kg	☼	121	74 - 134
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		2.15	2.25		ug/Kg	☼	105	53 - 158
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.03	2.44		ug/Kg	☼	120	66 - 136
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	F1	2.03	2.67		ug/Kg	☼	132	79 - 139

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C2 PFHxA	*95*		*25 - 150*
13C4 PFHpA	*95*		*25 - 150*
13C4 PFOA	*100*		*25 - 150*
13C5 PFNA	*90*		*25 - 150*
13C2 PFDA	*99*		*25 - 150*
13C2 PFUnA	*90*		*25 - 150*
13C2 PFDoA	*89*		*25 - 150*
13C2 PFTeDA	*82*		*25 - 150*
13C3 PFBS	*75*		*25 - 150*
18O2 PFHxS	*80*		*25 - 150*
13C4 PFOS	*80*		*25 - 150*
d3-NMeFOSAA	*109*		*25 - 150*
d5-NEtFOSAA	*98*		*25 - 150*
13C3 HFPO-DA	*92*		*25 - 150*

Lab Sample ID: 320-66142-11 MSD
Matrix: Solid
Analysis Batch: 430182

Client Sample ID: 10-28-SB7-01
Prep Type: Total/NA
Prep Batch: 429643

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	0.067	J	2.06	2.22		ug/Kg	☼	104	71 - 131	7	30
Perfluoroheptanoic acid (PFHpA)	ND		2.06	2.23		ug/Kg	☼	108	71 - 131	5	30
Perfluorooctanoic acid (PFOA)	ND		2.06	2.00		ug/Kg	☼	97	72 - 132	2	30
Perfluorononanoic acid (PFNA)	ND		2.06	2.27		ug/Kg	☼	110	73 - 133	3	30
Perfluorodecanoic acid (PFDA)	ND		2.06	2.31		ug/Kg	☼	112	72 - 132	3	30
Perfluoroundecanoic acid (PFUnA)	ND		2.06	2.40		ug/Kg	☼	116	66 - 126	6	30
Perfluorododecanoic acid (PFDoA)	ND		2.06	2.31		ug/Kg	☼	112	71 - 131	17	30
Perfluorotridecanoic acid (PFTriA)	ND		2.06	2.30		ug/Kg	☼	112	71 - 131	4	30
Perfluorotetradecanoic acid (PFTeA)	ND		2.06	2.19		ug/Kg	☼	106	67 - 127	13	30
Perfluorobutanesulfonic acid (PFBS)	ND		1.83	1.97		ug/Kg	☼	108	69 - 129	3	30
Perfluorohexanesulfonic acid (PFHxS)	0.25		1.88	2.23		ug/Kg	☼	106	62 - 122	3	30
Perfluorooctanesulfonic acid (PFOS)	ND		1.92	2.39		ug/Kg	☼	125	68 - 141	3	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.92	2.39		ug/Kg	☼	124	74 - 134	2	30

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-66142-11 MSD
Matrix: Solid
Analysis Batch: 430182

Client Sample ID: 10-28-SB7-01
Prep Type: Total/NA
Prep Batch: 429643

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		2.06	2.08		ug/Kg	☼	101	53 - 158	8	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.95	2.35		ug/Kg	☼	121	66 - 136	4	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	F1	1.95	2.79	F1	ug/Kg	☼	143	79 - 139	4	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C2 PFHxA	*93*		*25 - 150*
13C4 PFHpA	*95*		*25 - 150*
13C4 PFOA	*94*		*25 - 150*
13C5 PFNA	*91*		*25 - 150*
13C2 PFDA	*91*		*25 - 150*
13C2 PFUnA	*95*		*25 - 150*
13C2 PFDoA	*81*		*25 - 150*
13C2 PFTeDA	*84*		*25 - 150*
13C3 PFBS	*72*		*25 - 150*
18O2 PFHxS	*78*		*25 - 150*
13C4 PFOS	*75*		*25 - 150*
d3-NMeFOSAA	*107*		*25 - 150*
d5-NEtFOSAA	*104*		*25 - 150*
13C3 HFPO-DA	*94*		*25 - 150*

LCMS

Prep Batch: 427930

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66142-1	ANG-SB1-10	Total/NA	Solid	SHAKE	
320-66142-2	ANG-SB1-01	Total/NA	Solid	SHAKE	
320-66142-3	ANG-SB1-02	Total/NA	Solid	SHAKE	
320-66142-4	SS-01	Total/NA	Solid	SHAKE	
320-66142-5	SS-02	Total/NA	Solid	SHAKE	
320-66142-6	SS-03	Total/NA	Solid	SHAKE	
320-66142-7	SS-04	Total/NA	Solid	SHAKE	
320-66142-8	SS-05	Total/NA	Solid	SHAKE	
320-66142-9	SS-06	Total/NA	Solid	SHAKE	
320-66142-10	SS-07	Total/NA	Solid	SHAKE	
MB 320-427930/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-427930/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-66142-1 MS	ANG-SB1-10	Total/NA	Solid	SHAKE	
320-66142-1 MSD	ANG-SB1-10	Total/NA	Solid	SHAKE	

Analysis Batch: 429333

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66142-1	ANG-SB1-10	Total/NA	Solid	537 (modified)	427930
320-66142-2	ANG-SB1-01	Total/NA	Solid	537 (modified)	427930
320-66142-3	ANG-SB1-02	Total/NA	Solid	537 (modified)	427930
320-66142-4	SS-01	Total/NA	Solid	537 (modified)	427930
320-66142-5	SS-02	Total/NA	Solid	537 (modified)	427930
320-66142-6	SS-03	Total/NA	Solid	537 (modified)	427930
320-66142-7	SS-04	Total/NA	Solid	537 (modified)	427930
320-66142-8	SS-05	Total/NA	Solid	537 (modified)	427930
320-66142-9	SS-06	Total/NA	Solid	537 (modified)	427930
320-66142-10	SS-07	Total/NA	Solid	537 (modified)	427930
MB 320-427930/1-A	Method Blank	Total/NA	Solid	537 (modified)	427930
LCS 320-427930/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	427930
320-66142-1 MS	ANG-SB1-10	Total/NA	Solid	537 (modified)	427930
320-66142-1 MSD	ANG-SB1-10	Total/NA	Solid	537 (modified)	427930

Prep Batch: 429643

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66142-11	10-28-SB7-01	Total/NA	Solid	SHAKE	
320-66142-12	10-28-SB7-02	Total/NA	Solid	SHAKE	
320-66142-13	10-28-SB7-12	Total/NA	Solid	SHAKE	
320-66142-14	ARFF-SB3-01	Total/NA	Solid	SHAKE	
320-66142-15	ARFF-SB3-02	Total/NA	Solid	SHAKE	
320-66142-16	ARFF-SB3-03	Total/NA	Solid	SHAKE	
320-66142-17	ARFF-SB3-13	Total/NA	Solid	SHAKE	
320-66142-18	ARFF-SB4-01	Total/NA	Solid	SHAKE	
320-66142-19	ARFF-SB4-02	Total/NA	Solid	SHAKE	
320-66142-20	ARFF-SB4-03	Total/NA	Solid	SHAKE	
MB 320-429643/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-429643/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-66142-11 MS	10-28-SB7-01	Total/NA	Solid	SHAKE	
320-66142-11 MSD	10-28-SB7-01	Total/NA	Solid	SHAKE	

QC Association Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

LCMS

Analysis Batch: 430182

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66142-11	10-28-SB7-01	Total/NA	Solid	537 (modified)	429643
320-66142-12	10-28-SB7-02	Total/NA	Solid	537 (modified)	429643
320-66142-13	10-28-SB7-12	Total/NA	Solid	537 (modified)	429643
320-66142-14	ARFF-SB3-01	Total/NA	Solid	537 (modified)	429643
320-66142-15	ARFF-SB3-02	Total/NA	Solid	537 (modified)	429643
320-66142-16	ARFF-SB3-03	Total/NA	Solid	537 (modified)	429643
320-66142-17	ARFF-SB3-13	Total/NA	Solid	537 (modified)	429643
320-66142-18	ARFF-SB4-01	Total/NA	Solid	537 (modified)	429643
320-66142-19	ARFF-SB4-02	Total/NA	Solid	537 (modified)	429643
320-66142-20	ARFF-SB4-03	Total/NA	Solid	537 (modified)	429643
MB 320-429643/1-A	Method Blank	Total/NA	Solid	537 (modified)	429643
LCS 320-429643/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	429643
320-66142-11 MS	10-28-SB7-01	Total/NA	Solid	537 (modified)	429643
320-66142-11 MSD	10-28-SB7-01	Total/NA	Solid	537 (modified)	429643

General Chemistry

Analysis Batch: 427012

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66142-1	ANG-SB1-10	Total/NA	Solid	D 2216	
320-66142-2	ANG-SB1-01	Total/NA	Solid	D 2216	
320-66142-3	ANG-SB1-02	Total/NA	Solid	D 2216	
320-66142-4	SS-01	Total/NA	Solid	D 2216	
320-66142-5	SS-02	Total/NA	Solid	D 2216	
320-66142-6	SS-03	Total/NA	Solid	D 2216	
320-66142-7	SS-04	Total/NA	Solid	D 2216	
320-66142-8	SS-05	Total/NA	Solid	D 2216	
320-66142-9	SS-06	Total/NA	Solid	D 2216	
320-66142-10	SS-07	Total/NA	Solid	D 2216	
320-66142-11	10-28-SB7-01	Total/NA	Solid	D 2216	
320-66142-12	10-28-SB7-02	Total/NA	Solid	D 2216	
320-66142-13	10-28-SB7-12	Total/NA	Solid	D 2216	
320-66142-14	ARFF-SB3-01	Total/NA	Solid	D 2216	
320-66142-15	ARFF-SB3-02	Total/NA	Solid	D 2216	
320-66142-16	ARFF-SB3-03	Total/NA	Solid	D 2216	
320-66142-17	ARFF-SB3-13	Total/NA	Solid	D 2216	
320-66142-18	ARFF-SB4-01	Total/NA	Solid	D 2216	
320-66142-19	ARFF-SB4-02	Total/NA	Solid	D 2216	
320-66142-1 DU	ANG-SB1-10	Total/NA	Solid	D 2216	

Analysis Batch: 427776

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66142-20	ARFF-SB4-03	Total/NA	Solid	D 2216	

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: ANG-SB1-10
Date Collected: 10/23/20 23:10
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-1
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			427012	10/30/20 13:36	TCS	TAL SAC

Client Sample ID: ANG-SB1-10
Date Collected: 10/23/20 23:10
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-1
Matrix: Solid
Percent Solids: 82.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.38 g	10.0 mL	427930	11/03/20 06:32	NSS	TAL SAC
Total/NA	Analysis	537 (modified)		1			429333	11/08/20 04:49	D1R	TAL SAC

Client Sample ID: ANG-SB1-01
Date Collected: 10/23/20 23:20
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-2
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			427012	10/30/20 13:36	TCS	TAL SAC

Client Sample ID: ANG-SB1-01
Date Collected: 10/23/20 23:20
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-2
Matrix: Solid
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			5.36 g	10.0 mL	427930	11/03/20 06:32	NSS	TAL SAC
Total/NA	Analysis	537 (modified)		1			429333	11/08/20 05:17	D1R	TAL SAC

Client Sample ID: ANG-SB1-02
Date Collected: 10/23/20 23:25
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-3
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			427012	10/30/20 13:36	TCS	TAL SAC

Client Sample ID: ANG-SB1-02
Date Collected: 10/23/20 23:25
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-3
Matrix: Solid
Percent Solids: 90.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.24 g	10.0 mL	427930	11/03/20 06:32	NSS	TAL SAC
Total/NA	Analysis	537 (modified)		1			429333	11/08/20 05:26	D1R	TAL SAC

Client Sample ID: SS-01
Date Collected: 10/27/20 11:12
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-4
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			427012	10/30/20 13:36	TCS	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: SS-01
Date Collected: 10/27/20 11:12
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-4
Matrix: Solid
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			5.14 g	10.0 mL	427930	11/03/20 06:32	NSS	TAL SAC
Total/NA	Analysis	537 (modified)		1			429333	11/08/20 05:36	D1R	TAL SAC

Client Sample ID: SS-02
Date Collected: 10/27/20 11:35
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-5
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			427012	10/30/20 13:36	TCS	TAL SAC

Client Sample ID: SS-02
Date Collected: 10/27/20 11:35
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-5
Matrix: Solid
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			5.05 g	10.0 mL	427930	11/03/20 06:32	NSS	TAL SAC
Total/NA	Analysis	537 (modified)		1			429333	11/08/20 05:45	D1R	TAL SAC

Client Sample ID: SS-03
Date Collected: 10/27/20 11:55
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-6
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			427012	10/30/20 13:36	TCS	TAL SAC

Client Sample ID: SS-03
Date Collected: 10/27/20 11:55
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-6
Matrix: Solid
Percent Solids: 87.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.40 g	10.0 mL	427930	11/03/20 06:32	NSS	TAL SAC
Total/NA	Analysis	537 (modified)		1			429333	11/08/20 05:55	D1R	TAL SAC

Client Sample ID: SS-04
Date Collected: 10/27/20 12:15
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-7
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			427012	10/30/20 13:36	TCS	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: SS-04
Date Collected: 10/27/20 12:15
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-7
Matrix: Solid
Percent Solids: 84.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.32 g	10.0 mL	427930	11/03/20 06:32	NSS	TAL SAC
Total/NA	Analysis	537 (modified)		1			429333	11/08/20 06:23	D1R	TAL SAC

Client Sample ID: SS-05
Date Collected: 10/27/20 12:05
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-8
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			427012	10/30/20 13:36	TCS	TAL SAC

Client Sample ID: SS-05
Date Collected: 10/27/20 12:05
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-8
Matrix: Solid
Percent Solids: 85.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.37 g	10.0 mL	427930	11/03/20 06:32	NSS	TAL SAC
Total/NA	Analysis	537 (modified)		1			429333	11/08/20 06:32	D1R	TAL SAC

Client Sample ID: SS-06
Date Collected: 10/27/20 12:35
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-9
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			427012	10/30/20 13:36	TCS	TAL SAC

Client Sample ID: SS-06
Date Collected: 10/27/20 12:35
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-9
Matrix: Solid
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			5.20 g	10.0 mL	427930	11/03/20 06:32	NSS	TAL SAC
Total/NA	Analysis	537 (modified)		1			429333	11/08/20 06:42	D1R	TAL SAC

Client Sample ID: SS-07
Date Collected: 10/27/20 13:00
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66142-10
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			427012	10/30/20 13:36	TCS	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: SS-07
Lab Sample ID: 320-66142-10
Date Collected: 10/27/20 13:00
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 91.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.25 g	10.0 mL	427930	11/03/20 06:32	NSS	TAL SAC
Total/NA	Analysis	537 (modified)		1			429333	11/08/20 06:51	D1R	TAL SAC

Client Sample ID: 10-28-SB7-01
Lab Sample ID: 320-66142-11
Date Collected: 10/26/20 00:10
Matrix: Solid
Date Received: 10/29/20 10:55

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			427012	10/30/20 13:36	TCS	TAL SAC

Client Sample ID: 10-28-SB7-01
Lab Sample ID: 320-66142-11
Date Collected: 10/26/20 00:10
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 90.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.16 g	10.00 mL	429643	11/08/20 20:08	FX	TAL SAC
Total/NA	Analysis	537 (modified)		1			430182	11/10/20 18:06	D1R	TAL SAC

Client Sample ID: 10-28-SB7-02
Lab Sample ID: 320-66142-12
Date Collected: 10/26/20 00:25
Matrix: Solid
Date Received: 10/29/20 10:55

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			427012	10/30/20 13:36	TCS	TAL SAC

Client Sample ID: 10-28-SB7-02
Lab Sample ID: 320-66142-12
Date Collected: 10/26/20 00:25
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 71.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.06 g	10.00 mL	429643	11/08/20 20:08	FX	TAL SAC
Total/NA	Analysis	537 (modified)		1			430182	11/10/20 18:34	D1R	TAL SAC

Client Sample ID: 10-28-SB7-12
Lab Sample ID: 320-66142-13
Date Collected: 10/26/20 00:15
Matrix: Solid
Date Received: 10/29/20 10:55

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			427012	10/30/20 13:36	TCS	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: 10-28-SB7-12
Lab Sample ID: 320-66142-13
Date Collected: 10/26/20 00:15
Matrix: Solid
Date Received: 10/29/20 10:55
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			5.00 g	10.00 mL	429643	11/08/20 20:08	FX	TAL SAC
Total/NA	Analysis	537 (modified)		1			430182	11/10/20 18:44	D1R	TAL SAC

Client Sample ID: ARFF-SB3-01
Lab Sample ID: 320-66142-14
Date Collected: 10/26/20 16:25
Matrix: Solid
Date Received: 10/29/20 10:55

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			427012	10/30/20 13:36	TCS	TAL SAC

Client Sample ID: ARFF-SB3-01
Lab Sample ID: 320-66142-14
Date Collected: 10/26/20 16:25
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 93.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.34 g	10.00 mL	429643	11/08/20 20:08	FX	TAL SAC
Total/NA	Analysis	537 (modified)		1			430182	11/10/20 18:53	D1R	TAL SAC

Client Sample ID: ARFF-SB3-02
Lab Sample ID: 320-66142-15
Date Collected: 10/26/20 16:35
Matrix: Solid
Date Received: 10/29/20 10:55

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			427012	10/30/20 13:36	TCS	TAL SAC

Client Sample ID: ARFF-SB3-02
Lab Sample ID: 320-66142-15
Date Collected: 10/26/20 16:35
Matrix: Solid
Date Received: 10/29/20 10:55
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			5.01 g	10.00 mL	429643	11/08/20 20:08	FX	TAL SAC
Total/NA	Analysis	537 (modified)		1			430182	11/10/20 19:12	D1R	TAL SAC

Client Sample ID: ARFF-SB3-03
Lab Sample ID: 320-66142-16
Date Collected: 10/26/20 16:50
Matrix: Solid
Date Received: 10/29/20 10:55

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			427012	10/30/20 13:36	TCS	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: ARFF-SB3-03
Lab Sample ID: 320-66142-16
Date Collected: 10/26/20 16:50
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 83.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.36 g	10.00 mL	429643	11/08/20 20:08	FX	TAL SAC
Total/NA	Analysis	537 (modified)		1			430182	11/10/20 19:21	D1R	TAL SAC

Client Sample ID: ARFF-SB3-13
Lab Sample ID: 320-66142-17
Date Collected: 10/26/20 16:40
Matrix: Solid
Date Received: 10/29/20 10:55

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			427012	10/30/20 13:36	TCS	TAL SAC

Client Sample ID: ARFF-SB3-13
Lab Sample ID: 320-66142-17
Date Collected: 10/26/20 16:40
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 83.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.02 g	10.00 mL	429643	11/08/20 20:08	FX	TAL SAC
Total/NA	Analysis	537 (modified)		1			430182	11/10/20 19:31	D1R	TAL SAC

Client Sample ID: ARFF-SB4-01
Lab Sample ID: 320-66142-18
Date Collected: 10/26/20 19:15
Matrix: Solid
Date Received: 10/29/20 10:55

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			427012	10/30/20 13:36	TCS	TAL SAC

Client Sample ID: ARFF-SB4-01
Lab Sample ID: 320-66142-18
Date Collected: 10/26/20 19:15
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 95.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.38 g	10.00 mL	429643	11/08/20 20:08	FX	TAL SAC
Total/NA	Analysis	537 (modified)		1			430182	11/10/20 19:40	D1R	TAL SAC

Client Sample ID: ARFF-SB4-02
Lab Sample ID: 320-66142-19
Date Collected: 10/26/20 19:25
Matrix: Solid
Date Received: 10/29/20 10:55

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			427012	10/30/20 13:36	TCS	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Client Sample ID: ARFF-SB4-02

Lab Sample ID: 320-66142-19
Date Collected: 10/26/20 19:25
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 94.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.01 g	10.00 mL	429643	11/08/20 20:08	FX	TAL SAC
Total/NA	Analysis	537 (modified)		1			430182	11/10/20 19:49	D1R	TAL SAC

Client Sample ID: ARFF-SB4-03

Lab Sample ID: 320-66142-20
Date Collected: 10/26/20 19:45
Matrix: Solid
Date Received: 10/29/20 10:55

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			427776	11/02/20 15:57	KDB	TAL SAC

Client Sample ID: ARFF-SB4-03

Lab Sample ID: 320-66142-20
Date Collected: 10/26/20 19:45
Matrix: Solid
Date Received: 10/29/20 10:55
Percent Solids: 90.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.21 g	10.00 mL	429643	11/08/20 20:08	FX	TAL SAC
Total/NA	Analysis	537 (modified)		1			430182	11/10/20 19:59	D1R	TAL SAC

Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Laboratory: Eurofins TestAmerica, Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	01-20-21
ANAB	Dept. of Defense ELAP	L2468	01-20-21
ANAB	Dept. of Energy	L2468.01	01-20-21
ANAB	ISO/IEC 17025	L2468	01-20-21
Arizona	State	AZ0708	08-11-21
Arkansas DEQ	State	88-0691	06-17-21
California	State	2897	01-31-22
Colorado	State	CA0004	08-31-21
Connecticut	State	PH-0691	06-30-21
Florida	NELAP	E87570	06-30-21
Georgia	State	4040	01-30-21
Hawaii	State	<cert No.>	01-29-21
Illinois	NELAP	200060	03-17-21
Kansas	NELAP	E-10375	10-31-20 *
Louisiana	NELAP	01944	06-30-21
Maine	State	CA00004	04-14-22
Michigan	State	9947	08-03-23
Nevada	State	CA000442021-1	07-31-21
New Hampshire	NELAP	2997	04-18-21
New Jersey	NELAP	CA005	06-30-21
New York	NELAP	11666	04-01-21
Oregon	NELAP	4040	01-29-21
Pennsylvania	NELAP	68-01272	03-31-21
Texas	NELAP	T104704399-19-13	06-01-21
US Fish & Wildlife	US Federal Programs	58448	07-31-21
USDA	US Federal Programs	P330-18-00239	07-31-21
Utah	NELAP	CA000442019-01	02-28-21
Vermont	State	VT-4040	04-16-21
Virginia	NELAP	460278	03-14-21
Washington	State	C581	05-05-21
West Virginia (DW)	State	9930C	12-31-20
Wisconsin	State	998204680	08-31-21
Wyoming	State Program	8TMS-L	01-28-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
D 2216	Percent Moisture	ASTM	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 TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome PFT&PF

Job ID: 320-66142-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
320-66142-1	ANG-SB1-10	Solid	10/23/20 23:10	10/29/20 10:55	
320-66142-2	ANG-SB1-01	Solid	10/23/20 23:20	10/29/20 10:55	
320-66142-3	ANG-SB1-02	Solid	10/23/20 23:25	10/29/20 10:55	
320-66142-4	SS-01	Solid	10/27/20 11:12	10/29/20 10:55	
320-66142-5	SS-02	Solid	10/27/20 11:35	10/29/20 10:55	
320-66142-6	SS-03	Solid	10/27/20 11:55	10/29/20 10:55	
320-66142-7	SS-04	Solid	10/27/20 12:15	10/29/20 10:55	
320-66142-8	SS-05	Solid	10/27/20 12:05	10/29/20 10:55	
320-66142-9	SS-06	Solid	10/27/20 12:35	10/29/20 10:55	
320-66142-10	SS-07	Solid	10/27/20 13:00	10/29/20 10:55	
320-66142-11	10-28-SB7-01	Solid	10/26/20 00:10	10/29/20 10:55	
320-66142-12	10-28-SB7-02	Solid	10/26/20 00:25	10/29/20 10:55	
320-66142-13	10-28-SB7-12	Solid	10/26/20 00:15	10/29/20 10:55	
320-66142-14	ARFF-SB3-01	Solid	10/26/20 16:25	10/29/20 10:55	
320-66142-15	ARFF-SB3-02	Solid	10/26/20 16:35	10/29/20 10:55	
320-66142-16	ARFF-SB3-03	Solid	10/26/20 16:50	10/29/20 10:55	
320-66142-17	ARFF-SB3-13	Solid	10/26/20 16:40	10/29/20 10:55	
320-66142-18	ARFF-SB4-01	Solid	10/26/20 19:15	10/29/20 10:55	
320-66142-19	ARFF-SB4-02	Solid	10/26/20 19:25	10/29/20 10:55	
320-66142-20	ARFF-SB4-03	Solid	10/26/20 19:45	10/29/20 10:55	

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600
www.shannonwilson.com

CHAIN-OF-CUSTODY RECORD

Test America Page 1 of 2
Laboratory ~~SGS North America~~
Attn: ~~Jen Jacobins~~ David Alltucker

Turn Around Time: [X] Normal [ ] Rush — Please Specify

Quote No: —

J-Flags: [X] Yes [ ] No

Analytical Methods (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	PFAS x18 537.1M (1SX)	Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
ANG-SB1-10		2310	10/23/20	X	1	Soil
ANG-SB1-01		2320		X	1	
ANG-SB1-02		2325		X	1	
~~AKG~~ SS-01		1112	10/27/20	X	1	
SS-02		1135		X	1	
SS-03		1155		X	1	
SS-04		1215		X	1	
SS-05		1205		X	1	
SS-06		1235		X	1	
SS-07		1300		X	1	

320-66142 Chain of Custody

Project Information	
Number:	105745
Name:	NOME DOT&PF
Contact:	MDN
Ongoing Project?	Yes [X] No [ ]
Sampler:	KPW/VTY/MDN

Sample Receipt	
Total No. of Containers:	20
COC Seals/Intact? Y/N/NA	
Received Good Cond./Cold	
Temp:	
Delivery Method:	~~Hand~~ Goldstreak

Notes:

Please bill to 105745-002

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: BG. Time: 1600	Signature: Time:	Signature: Time:
Printed Name: Veseling Yakimovq Date: 10/27/20	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 1555	Signature: Time:	Signature: Time:
Printed Name: Date: 29 Oct 20	Printed Name: Date:	Printed Name: Date:
Company: ~~ETA~~ W Sac	Company:	Company:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

1.6°C

No. 36147

CHAIN-OF-CUSTODY RECORD

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600
www.shannonwilson.com

Page 2 of 2
Laboratory: Test America
Attn: David Alltucker

Turn Around Time: [X] Normal [ ] Rush
Please Specify

Quote No: —

J-Flags: [X] Yes [ ] No

Analytical Methods (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	PFAS ×18 (537.1M)							Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
10-28-SB7-01		0010	10/26/20	X							1	Soil
10-28-SB7-02		0025	↓	X							↓	↓
10-28-SB7-12		0015	↓	X							↓	↓
~~10-28~~ ARFF-SB3-01		1625	10/27/20	X							↓	↓
ARFF-SB3-02		1635	↓	X							↓	↓
ARFF-SB3-03		1650	↓	X							↓	↓
ARFF-SB3-13		1640	↓	X							↓	↓
ARFF-SB4-01		1915	↓	X							↓	↓
ARFF-SB4-02		1925	↓	X							↓	↓
ARFF-SB4-03		1945	↓	X							↓	↓

Project Information

Number: 105745
Name: Nome DOT&PF
Contact: MDN
Ongoing Project? Yes [X] No [ ]
Sampler: VTY/MDN/APW

Sample Receipt

Total No. of Containers: 20
COC Seals/Intact? Y/N/NA
Received Good Cond./Cold
Temp:
Delivery Method: Goldstreak

Notes:

Please bill to 105745-002

Reliquished By: 1.	Reliquished By: 2.	Reliquished By: 3.
Signature: [signature] Time: 1600	Signature: Time:	Signature: Time:
Printed Name: Marcy Nadel Date: 10/27/20	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: [signature] Time: 1155	Signature: Time:	Signature: Time:
Printed Name: Jennifer Sarlington Date: 29 Oct 20	Printed Name: Date:	Printed Name: Date:
Company: ETA WSac	Company:	Company:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

1.6°C

No. 36152

Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 320-66142-1

Login Number: 66142
List Number: 1
Creator: Oropeza, Salvador

List Source: Eurofins TestAmerica, Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	Seals
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	only gel packs
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 <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Laboratory Data Review Checklist

Completed By:

Veselina Yakimova

Title:

Geologist

Date:

November 11, 2020

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

Eurofins / TestAmerica Laboratories, Inc.

Laboratory Report Number:

320-66142-1

Laboratory Report Date:

November 11, 2020

CS Site Name:

Nome Airport Statewide PFAS

ADEC File Number:

400.38.056

Hazard Identification Number:

27154

320-66142-1

Laboratory Report Date:

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☒ No☐ N/A☐ Comments:

   The DEC certified TestAmerica of West Sacramento, CA for the analysis of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) on February 6, 2018 by method 537. These compounds were included in the DEC's Contaminated Sites Laboratory Approval 17-020.

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☐ No☐ N/A☒ Comments:

   The requested analyses were conducted by TestAmerica Laboratories in West Sacramento, CA.

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:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☐ No☐ N/A☒ Comments:

   PFAS samples do not require preservation other than temperature control.

   c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

   Yes☒ No☐ N/A☐ Comments:

   The sample receipt form notes that the samples arrived in good condition.

Laboratory Report Date:

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:

No discrepancies were noted by the laboratory in the sample receipt documentation.

e. Data quality or usability affected?

Comments:

The data quality and/or usability was not affected; see above.

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 case narrative notes that the recovery for perfluoroundecanoic acid (PFUnA) was outside of laboratory control limits in the matrix spike (MS) sample associated with preparation batch 320-427930. Matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

The recovery of 4,8-dioxa-3H-perfluorononanoic acid (ADONA) was outside of laboratory control limits in the MS duplicate (MSD) sample associated with preparation batch 320-429643. Matrix interference is suspected because the associated LCS recovery was within acceptance limits.

Sample *SS-02* was noted to be cloudy and have a slightly yellow hue after extraction.

Samples *10-28-SB7-02, 10-28-SB7-12, ARFF-SB3-01* and *ARFF-SB3-02* were noted to have a yellow hue after final voluming.

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

No corrective actions are documented in the case narrative.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

The case narrative does not specify an effect on data quality/usability. See section 6.c for further assessment.

320-66142-1

Laboratory Report Date:

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 reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☒ No☐ N/A☐ Comments:

The reporting limit (RL) is less than the applicable DEC regulatory limit for the project.

e. Data quality or usability affected?

The data quality and/or usability was not affected; see above.

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 limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

N/A; target analytes were not detected 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:

No samples are affected; see above.

v. Data quality or usability affected?

Comments:

The data quality/usability is not affected.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes☒ No☐ N/A☐ Comments:

An LCS was reported for each of the associated preparatory batches.

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

Metals and/or inorganics were not analyzed as part of this work order.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

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. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☐ No☐ N/A☒ Comments:

LCSDs were not reported for either batch. Refer to MS/MSD results for assessment of method precision.

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

NA; 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 of the data was not required; see above.

Laboratory Report Date:

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and/or usability was not affected; see above.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

Metals and/or inorganics were not analyzed as part of 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 recovery of PFUnA exceeded the laboratory's upper control limit in the MS/MSD samples associated with preparation batch 320-427930.

The recovery of ADONA exceeded the laboratory's upper control limit in the MSD sample associated with preparation batch 320-429643.

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:

Sample *ANG-SB1-10* was used as a parent sample for the MS/MSD reported in preparation batch 320-427930.

Sample *10-28-SB7-01* was used as a parent sample for the MS/MSD reported in preparation batch 320-429643.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

The elevated MS/MSD recoveries imply a high bias in the method recovery. However, the parent samples from which the MS/MSDs were spiked did not contain detectable concentrations of the affected analytes. The non-detect results are therefore unaffected by the elevated method recovery.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and/or usability was not 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:

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:

There were no IDA recovery failures associated with this work order.

iv. Data quality or usability affected?

Comments:

The data quality and/or usability was 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. A trip blank is not required for the requested analysis.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes☐ No☐ N/A☒ Comments:

A trip blank is not required for the requested analysis.

iii. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

A trip blank is not required for the requested analysis.

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

NA; a trip blank is not required for the requested analysis.

v. Data quality or usability affected?

Comments:

The data quality and/or usability was not affected; see above.

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☒ No☐ N/A☐ Comments:

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

The field duplicate pairs *ANG-SB1-01 / ANG-SB1-10, SS-04 / SS-05, 10-28-SB7-02 / 10-28-SB7-12* and *ARFF-SB3-03 / ARFF-SB3-13* were submitted with this work order.

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

RPD (%) = 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:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

The data quality and/or usability was not affected; see above.

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☐ N/A☒ Comments:

Reusable equipment was not utilized during the sample collection process for the samples associated with this work order.

Laboratory Report Date:

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

No equipment blank was submitted with this work order.

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

N/A; see above.

iii. Data quality or usability affected?

Comments:

No; see above.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes☐ No☐ N/A☒ Comments:

No additional flags applied.

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

Laboratory Job ID: 320-66143-1
Client Project/Site: OME
Revision: 1

For:
Shannon & Wilson, Inc
2355 Hill Rd.
Fairbanks, Alaska 99709-5244

Attn: Marcy Nadel

Authorized for release by:
11/19/2020 8:22:43 AM

David Alltucker, Project Manager I
(916)374-4383
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Table of Contents

Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66143-1

Qualifiers

LCMS

Qualifier	Qualifier Description
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.
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.
¤	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

Job ID: 320-66143-1

Laboratory: Eurofins TestAmerica, Sacramento

Narrative

Job Narrative
320-66143-1

Revision 1-19-2020: This report has been revised to add batch ms/msd results.

Receipt
The samples were received on 10/29/2020 10:55 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.6º C.

LCMS
Method 537 (modified): The "I" qualifier means the transition mass ratio for the indicated analyte(s) was outside of the established ratio limits. The qualitative identification of the analyte(s) has/have some degree of uncertainty. However, analyst judgment was used to positively identify the analyte(s). 10-28-TWP-05 (320-66143-4) and 10-28-TWP-06 (320-66143-5)

Method 537 (modified): Due to the high concentration of several target analytes, the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 320-426936 and analytical batch 320-427560 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

Method 537 (modified): Results for samples (280-142031-B-2-A), (280-142031-A-2-A MS) and (280-142031-A-2-B MSD) were reported from the analysis of a diluted extract due to high concentration of the target analytes as well as matrix interferences 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.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method 3535: The following samples contain a thin layer of sediments at the bottom of the bottle prior to extraction: 3-21-TWP-01 (320-66143-8) and LNDFL-TWP-01 (320-66143-9).

Method 3535: During the solid phase extraction process, the following samples contain non-settable particulates which clogged the solid phase extraction column: 3-21-TWP-01 (320-66143-8) and LNDFL-TWP-01 (320-66143-9).

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: OME

Job ID: 320-66143-1

Client Sample ID: 3-21-TWP-04 — Lab Sample ID: 320-66143-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	19		1.9	0.54	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	10		1.9	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	12		1.9	0.80	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	1.8	J	1.9	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	1.1	J	1.9	0.29	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	3.3		1.9	0.19	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	27		1.9	0.53	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	71	B	1.9	0.51	ng/L	1		537 (modified)	Total/NA

Client Sample ID: 3-21-TWP-05 — Lab Sample ID: 320-66143-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	19		1.9	0.54	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	11		1.9	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	11		1.9	0.80	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	1.7	J	1.9	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	1.1	J	1.9	0.29	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	3.3		1.9	0.19	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	26		1.9	0.53	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	72	B	1.9	0.51	ng/L	1		537 (modified)	Total/NA

Client Sample ID: 10-28-TWP-02 — Lab Sample ID: 320-66143-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	2.4		1.9	0.56	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.75	J	1.9	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.31	J	1.9	0.19	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.5		1.9	0.55	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	2.0	B	1.9	0.52	ng/L	1		537 (modified)	Total/NA

Client Sample ID: 10-28-TWP-05 — Lab Sample ID: 320-66143-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	170		2.1	0.60	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	51		2.1	0.26	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	40		2.1	0.88	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.85	J	2.1	0.28	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	43		2.1	0.21	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	330		2.1	0.59	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	98	I B	2.1	0.56	ng/L	1		537 (modified)	Total/NA

Client Sample ID: 10-28-TWP-06 — Lab Sample ID: 320-66143-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	160		1.9	0.54	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	52		1.9	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	43		1.9	0.80	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.74	J	1.9	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	42		1.9	0.19	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	330		1.9	0.54	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	99	I B	1.9	0.51	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66143-1

Client Sample ID: 10-28-TWP-07 — Lab Sample ID: 320-66143-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	8.2		1.9	0.55	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.1		1.9	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.84	J	1.9	0.80	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.82	J	1.9	0.19	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	4.5		1.9	0.54	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.86	J B	1.9	0.51	ng/L	1		537 (modified)	Total/NA

Client Sample ID: 10-28-TWP-08 — Lab Sample ID: 320-66143-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	8.3		1.8	0.53	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.1		1.8	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.88	J	1.8	0.78	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.81	J	1.8	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	4.3		1.8	0.53	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.88	J B	1.8	0.50	ng/L	1		537 (modified)	Total/NA

Client Sample ID: 3-21-TWP-01 — Lab Sample ID: 320-66143-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	9.6		2.0	0.57	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.6		2.0	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	3.3		2.0	0.84	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.42	J	2.0	0.27	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.5	J	2.0	0.20	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	12		2.0	0.56	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	11	B	2.0	0.53	ng/L	1		537 (modified)	Total/NA

Client Sample ID: LNDFL-TWP-01 — Lab Sample ID: 320-66143-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	17		2.0	0.58	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.9		2.0	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	3.6		2.0	0.85	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	4.5		2.0	0.20	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	19		2.0	0.57	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	6.6	B	2.0	0.54	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66143-1

Client Sample ID: 3-21-TWP-04

Date Collected: 10/24/20 18:40
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66143-1

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**19**		1.9	0.54	ng/L		10/30/20 11:25	11/01/20 07:43	1
Perfluoroheptanoic acid (PFHpA)	**10**		1.9	0.23	ng/L		10/30/20 11:25	11/01/20 07:43	1
Perfluorooctanoic acid (PFOA)	**12**		1.9	0.80	ng/L		10/30/20 11:25	11/01/20 07:43	1
Perfluorononanoic acid (PFNA)	**1.8**	**J**	1.9	0.25	ng/L		10/30/20 11:25	11/01/20 07:43	1
Perfluorodecanoic acid (PFDA)	**1.1**	**J**	1.9	0.29	ng/L		10/30/20 11:25	11/01/20 07:43	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.0	ng/L		10/30/20 11:25	11/01/20 07:43	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.52	ng/L		10/30/20 11:25	11/01/20 07:43	1
Perfluorotridecanoic acid (PFTriA)	ND		1.9	1.2	ng/L		10/30/20 11:25	11/01/20 07:43	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9	0.68	ng/L		10/30/20 11:25	11/01/20 07:43	1
Perfluorobutanesulfonic acid (PFBS)	**3.3**		1.9	0.19	ng/L		10/30/20 11:25	11/01/20 07:43	1
Perfluorohexanesulfonic acid (PFHxS)	**27**		1.9	0.53	ng/L		10/30/20 11:25	11/01/20 07:43	1
Perfluorooctanesulfonic acid (PFOS)	**71**	**B**	1.9	0.51	ng/L		10/30/20 11:25	11/01/20 07:43	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.7	1.1	ng/L		10/30/20 11:25	11/01/20 07:43	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.7	1.2	ng/L		10/30/20 11:25	11/01/20 07:43	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.9	0.22	ng/L		10/30/20 11:25	11/01/20 07:43	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.7	1.4	ng/L		10/30/20 11:25	11/01/20 07:43	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.9	0.30	ng/L		10/30/20 11:25	11/01/20 07:43	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.37	ng/L		10/30/20 11:25	11/01/20 07:43	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*92*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:43*	*1*
13C4 PFHpA	*100*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:43*	*1*
13C4 PFOA	*104*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:43*	*1*
13C5 PFNA	*102*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:43*	*1*
13C2 PFDA	*97*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:43*	*1*
13C2 PFUnA	*88*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:43*	*1*
13C2 PFDoA	*88*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:43*	*1*
13C2 PFTeDA	*91*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:43*	*1*
13C3 PFBS	*89*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:43*	*1*
18O2 PFHxS	*100*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:43*	*1*
13C4 PFOS	*96*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:43*	*1*
d3-NMeFOSAA	*70*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:43*	*1*
d5-NEtFOSAA	*71*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:43*	*1*
13C3 HFPO-DA	*86*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:43*	*1*

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66143-1

Client Sample ID: 3-21-TWP-05

Date Collected: 10/24/20 18:30
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66143-2

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**19**		1.9	0.54	ng/L		10/30/20 11:25	11/01/20 07:52	1
Perfluoroheptanoic acid (PFHpA)	**11**		1.9	0.23	ng/L		10/30/20 11:25	11/01/20 07:52	1
Perfluorooctanoic acid (PFOA)	**11**		1.9	0.80	ng/L		10/30/20 11:25	11/01/20 07:52	1
Perfluorononanoic acid (PFNA)	**1.7**	**J**	1.9	0.25	ng/L		10/30/20 11:25	11/01/20 07:52	1
Perfluorodecanoic acid (PFDA)	**1.1**	**J**	1.9	0.29	ng/L		10/30/20 11:25	11/01/20 07:52	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.0	ng/L		10/30/20 11:25	11/01/20 07:52	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.51	ng/L		10/30/20 11:25	11/01/20 07:52	1
Perfluorotridecanoic acid (PFTriA)	ND		1.9	1.2	ng/L		10/30/20 11:25	11/01/20 07:52	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9	0.68	ng/L		10/30/20 11:25	11/01/20 07:52	1
Perfluorobutanesulfonic acid (PFBS)	**3.3**		1.9	0.19	ng/L		10/30/20 11:25	11/01/20 07:52	1
Perfluorohexanesulfonic acid (PFHxS)	**26**		1.9	0.53	ng/L		10/30/20 11:25	11/01/20 07:52	1
Perfluorooctanesulfonic acid (PFOS)	**72**	**B**	1.9	0.51	ng/L		10/30/20 11:25	11/01/20 07:52	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.7	1.1	ng/L		10/30/20 11:25	11/01/20 07:52	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.7	1.2	ng/L		10/30/20 11:25	11/01/20 07:52	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.9	0.22	ng/L		10/30/20 11:25	11/01/20 07:52	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.7	1.4	ng/L		10/30/20 11:25	11/01/20 07:52	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.9	0.30	ng/L		10/30/20 11:25	11/01/20 07:52	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.37	ng/L		10/30/20 11:25	11/01/20 07:52	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*93*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:52*	*1*
13C4 PFHpA	*98*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:52*	*1*
13C4 PFOA	*108*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:52*	*1*
13C5 PFNA	*103*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:52*	*1*
13C2 PFDA	*96*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:52*	*1*
13C2 PFUnA	*86*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:52*	*1*
13C2 PFDoA	*79*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:52*	*1*
13C2 PFTeDA	*81*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:52*	*1*
13C3 PFBS	*89*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:52*	*1*
18O2 PFHxS	*100*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:52*	*1*
13C4 PFOS	*95*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:52*	*1*
d3-NMeFOSAA	*65*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:52*	*1*
d5-NEtFOSAA	*67*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:52*	*1*
13C3 HFPO-DA	*87*		*25 - 150*	*10/30/20 11:25*	*11/01/20 07:52*	*1*

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66143-1

Client Sample ID: 10-28-TWP-02

Date Collected: 10/25/20 11:39
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66143-3

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**2.4**		1.9	0.56	ng/L		10/30/20 11:25	11/01/20 08:02	1
Perfluoroheptanoic acid (PFHpA)	**0.75**	**J**	1.9	0.24	ng/L		10/30/20 11:25	11/01/20 08:02	1
Perfluorooctanoic acid (PFOA)	ND		1.9	0.82	ng/L		10/30/20 11:25	11/01/20 08:02	1
Perfluorononanoic acid (PFNA)	ND		1.9	0.26	ng/L		10/30/20 11:25	11/01/20 08:02	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.30	ng/L		10/30/20 11:25	11/01/20 08:02	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.1	ng/L		10/30/20 11:25	11/01/20 08:02	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.53	ng/L		10/30/20 11:25	11/01/20 08:02	1
Perfluorotridecanoic acid (PFTriA)	ND		1.9	1.3	ng/L		10/30/20 11:25	11/01/20 08:02	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9	0.70	ng/L		10/30/20 11:25	11/01/20 08:02	1
Perfluorobutanesulfonic acid (PFBS)	**0.31**	**J**	1.9	0.19	ng/L		10/30/20 11:25	11/01/20 08:02	1
Perfluorohexanesulfonic acid (PFHxS)	**2.5**		1.9	0.55	ng/L		10/30/20 11:25	11/01/20 08:02	1
Perfluorooctanesulfonic acid (PFOS)	**2.0**	**B**	1.9	0.52	ng/L		10/30/20 11:25	11/01/20 08:02	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.8	1.2	ng/L		10/30/20 11:25	11/01/20 08:02	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.8	1.3	ng/L		10/30/20 11:25	11/01/20 08:02	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.9	0.23	ng/L		10/30/20 11:25	11/01/20 08:02	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.9	1.4	ng/L		10/30/20 11:25	11/01/20 08:02	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.9	0.31	ng/L		10/30/20 11:25	11/01/20 08:02	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.39	ng/L		10/30/20 11:25	11/01/20 08:02	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*93*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:02*	*1*
13C4 PFHpA	*99*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:02*	*1*
13C4 PFOA	*105*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:02*	*1*
13C5 PFNA	*102*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:02*	*1*
13C2 PFDA	*94*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:02*	*1*
13C2 PFUnA	*85*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:02*	*1*
13C2 PFDoA	*84*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:02*	*1*
13C2 PFTeDA	*89*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:02*	*1*
13C3 PFBS	*88*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:02*	*1*
18O2 PFHxS	*96*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:02*	*1*
13C4 PFOS	*95*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:02*	*1*
d3-NMeFOSAA	*66*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:02*	*1*
d5-NEtFOSAA	*70*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:02*	*1*
13C3 HFPO-DA	*86*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:02*	*1*

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66143-1

Client Sample ID: 10-28-TWP-05
Date Collected: 10/25/20 15:03
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66143-4
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**170**		2.1	0.60	ng/L		10/30/20 11:25	11/01/20 08:11	1
Perfluoroheptanoic acid (PFHpA)	**51**		2.1	0.26	ng/L		10/30/20 11:25	11/01/20 08:11	1
Perfluorooctanoic acid (PFOA)	**40**		2.1	0.88	ng/L		10/30/20 11:25	11/01/20 08:11	1
Perfluorononanoic acid (PFNA)	**0.85**	**J**	2.1	0.28	ng/L		10/30/20 11:25	11/01/20 08:11	1
Perfluorodecanoic acid (PFDA)	ND		2.1	0.32	ng/L		10/30/20 11:25	11/01/20 08:11	1
Perfluoroundecanoic acid (PFUnA)	ND		2.1	1.1	ng/L		10/30/20 11:25	11/01/20 08:11	1
Perfluorododecanoic acid (PFDoA)	ND		2.1	0.57	ng/L		10/30/20 11:25	11/01/20 08:11	1
Perfluorotridecanoic acid (PFTriA)	ND		2.1	1.3	ng/L		10/30/20 11:25	11/01/20 08:11	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.1	0.75	ng/L		10/30/20 11:25	11/01/20 08:11	1
Perfluorobutanesulfonic acid (PFBS)	**43**		2.1	0.21	ng/L		10/30/20 11:25	11/01/20 08:11	1
Perfluorohexanesulfonic acid (PFHxS)	**330**		2.1	0.59	ng/L		10/30/20 11:25	11/01/20 08:11	1
Perfluorooctanesulfonic acid (PFOS)	**98**	**I B**	2.1	0.56	ng/L		10/30/20 11:25	11/01/20 08:11	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		5.2	1.2	ng/L		10/30/20 11:25	11/01/20 08:11	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		5.2	1.3	ng/L		10/30/20 11:25	11/01/20 08:11	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.1	0.25	ng/L		10/30/20 11:25	11/01/20 08:11	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		4.1	1.5	ng/L		10/30/20 11:25	11/01/20 08:11	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.1	0.33	ng/L		10/30/20 11:25	11/01/20 08:11	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.1	0.41	ng/L		10/30/20 11:25	11/01/20 08:11	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*87*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:11*	*1*
13C4 PFHpA	*96*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:11*	*1*
13C4 PFOA	*105*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:11*	*1*
13C5 PFNA	*102*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:11*	*1*
13C2 PFDA	*96*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:11*	*1*
13C2 PFUnA	*91*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:11*	*1*
13C2 PFDoA	*88*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:11*	*1*
13C2 PFTeDA	*86*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:11*	*1*
13C3 PFBS	*80*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:11*	*1*
18O2 PFHxS	*94*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:11*	*1*
13C4 PFOS	*97*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:11*	*1*
d3-NMeFOSAA	*70*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:11*	*1*
d5-NEtFOSAA	*68*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:11*	*1*
13C3 HFPO-DA	*81*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:11*	*1*

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66143-1

Client Sample ID: 10-28-TWP-06
Date Collected: 10/25/20 14:53
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66143-5
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**160**		1.9	0.54	ng/L		10/30/20 11:25	11/01/20 08:20	1
Perfluoroheptanoic acid (PFHpA)	**52**		1.9	0.23	ng/L		10/30/20 11:25	11/01/20 08:20	1
Perfluorooctanoic acid (PFOA)	**43**		1.9	0.80	ng/L		10/30/20 11:25	11/01/20 08:20	1
Perfluorononanoic acid (PFNA)	**0.74**	**J**	1.9	0.25	ng/L		10/30/20 11:25	11/01/20 08:20	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.29	ng/L		10/30/20 11:25	11/01/20 08:20	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.0	ng/L		10/30/20 11:25	11/01/20 08:20	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.52	ng/L		10/30/20 11:25	11/01/20 08:20	1
Perfluorotridecanoic acid (PFTriA)	ND		1.9	1.2	ng/L		10/30/20 11:25	11/01/20 08:20	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9	0.69	ng/L		10/30/20 11:25	11/01/20 08:20	1
Perfluorobutanesulfonic acid (PFBS)	**42**		1.9	0.19	ng/L		10/30/20 11:25	11/01/20 08:20	1
Perfluorohexanesulfonic acid (PFHxS)	**330**		1.9	0.54	ng/L		10/30/20 11:25	11/01/20 08:20	1
Perfluorooctanesulfonic acid (PFOS)	**99**	**I B**	1.9	0.51	ng/L		10/30/20 11:25	11/01/20 08:20	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.7	1.1	ng/L		10/30/20 11:25	11/01/20 08:20	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.7	1.2	ng/L		10/30/20 11:25	11/01/20 08:20	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.9	0.23	ng/L		10/30/20 11:25	11/01/20 08:20	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.8	1.4	ng/L		10/30/20 11:25	11/01/20 08:20	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.9	0.30	ng/L		10/30/20 11:25	11/01/20 08:20	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.38	ng/L		10/30/20 11:25	11/01/20 08:20	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*90*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:20*	*1*
13C4 PFHpA	*96*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:20*	*1*
13C4 PFOA	*107*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:20*	*1*
13C5 PFNA	*103*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:20*	*1*
13C2 PFDA	*101*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:20*	*1*
13C2 PFUnA	*98*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:20*	*1*
13C2 PFDoA	*86*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:20*	*1*
13C2 PFTeDA	*84*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:20*	*1*
13C3 PFBS	*80*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:20*	*1*
18O2 PFHxS	*95*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:20*	*1*
13C4 PFOS	*100*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:20*	*1*
d3-NMeFOSAA	*72*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:20*	*1*
d5-NEtFOSAA	*76*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:20*	*1*
13C3 HFPO-DA	*84*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:20*	*1*

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66143-1

Client Sample ID: 10-28-TWP-07
Date Collected: 10/26/20 17:05
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66143-6
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**8.2**		1.9	0.55	ng/L		10/30/20 11:25	11/01/20 08:30	1
Perfluoroheptanoic acid (PFHpA)	**2.1**		1.9	0.24	ng/L		10/30/20 11:25	11/01/20 08:30	1
Perfluorooctanoic acid (PFOA)	**0.84**	**J**	1.9	0.80	ng/L		10/30/20 11:25	11/01/20 08:30	1
Perfluorononanoic acid (PFNA)	ND		1.9	0.25	ng/L		10/30/20 11:25	11/01/20 08:30	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.29	ng/L		10/30/20 11:25	11/01/20 08:30	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.0	ng/L		10/30/20 11:25	11/01/20 08:30	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.52	ng/L		10/30/20 11:25	11/01/20 08:30	1
Perfluorotridecanoic acid (PFTriA)	ND		1.9	1.2	ng/L		10/30/20 11:25	11/01/20 08:30	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9	0.69	ng/L		10/30/20 11:25	11/01/20 08:30	1
Perfluorobutanesulfonic acid (PFBS)	**0.82**	**J**	1.9	0.19	ng/L		10/30/20 11:25	11/01/20 08:30	1
Perfluorohexanesulfonic acid (PFHxS)	**4.5**		1.9	0.54	ng/L		10/30/20 11:25	11/01/20 08:30	1
Perfluorooctanesulfonic acid (PFOS)	**0.86**	**J B**	1.9	0.51	ng/L		10/30/20 11:25	11/01/20 08:30	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.7	1.1	ng/L		10/30/20 11:25	11/01/20 08:30	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.7	1.2	ng/L		10/30/20 11:25	11/01/20 08:30	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.9	0.23	ng/L		10/30/20 11:25	11/01/20 08:30	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.8	1.4	ng/L		10/30/20 11:25	11/01/20 08:30	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.9	0.30	ng/L		10/30/20 11:25	11/01/20 08:30	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.38	ng/L		10/30/20 11:25	11/01/20 08:30	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*98*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:30*	*1*
13C4 PFHpA	*106*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:30*	*1*
13C4 PFOA	*111*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:30*	*1*
13C5 PFNA	*103*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:30*	*1*
13C2 PFDA	*103*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:30*	*1*
13C2 PFUnA	*97*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:30*	*1*
13C2 PFDoA	*96*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:30*	*1*
13C2 PFTeDA	*96*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:30*	*1*
13C3 PFBS	*89*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:30*	*1*
18O2 PFHxS	*99*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:30*	*1*
13C4 PFOS	*102*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:30*	*1*
d3-NMeFOSAA	*76*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:30*	*1*
d5-NEtFOSAA	*79*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:30*	*1*
13C3 HFPO-DA	*86*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:30*	*1*

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66143-1

Client Sample ID: 10-28-TWP-08

Date Collected: 10/26/20 17:10
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66143-7

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**8.3**		1.8	0.53	ng/L		10/30/20 11:25	11/01/20 08:39	1
Perfluoroheptanoic acid (PFHpA)	**2.1**		1.8	0.23	ng/L		10/30/20 11:25	11/01/20 08:39	1
Perfluorooctanoic acid (PFOA)	**0.88**	**J**	1.8	0.78	ng/L		10/30/20 11:25	11/01/20 08:39	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.25	ng/L		10/30/20 11:25	11/01/20 08:39	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.29	ng/L		10/30/20 11:25	11/01/20 08:39	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	1.0	ng/L		10/30/20 11:25	11/01/20 08:39	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.51	ng/L		10/30/20 11:25	11/01/20 08:39	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		10/30/20 11:25	11/01/20 08:39	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.67	ng/L		10/30/20 11:25	11/01/20 08:39	1
Perfluorobutanesulfonic acid (PFBS)	**0.81**	**J**	1.8	0.18	ng/L		10/30/20 11:25	11/01/20 08:39	1
Perfluorohexanesulfonic acid (PFHxS)	**4.3**		1.8	0.53	ng/L		10/30/20 11:25	11/01/20 08:39	1
Perfluorooctanesulfonic acid (PFOS)	**0.88**	**J B**	1.8	0.50	ng/L		10/30/20 11:25	11/01/20 08:39	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.6	1.1	ng/L		10/30/20 11:25	11/01/20 08:39	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.6	1.2	ng/L		10/30/20 11:25	11/01/20 08:39	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.8	0.22	ng/L		10/30/20 11:25	11/01/20 08:39	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.7	1.4	ng/L		10/30/20 11:25	11/01/20 08:39	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.8	0.29	ng/L		10/30/20 11:25	11/01/20 08:39	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.8	0.37	ng/L		10/30/20 11:25	11/01/20 08:39	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*94*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:39*	*1*
13C4 PFHpA	*102*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:39*	*1*
13C4 PFOA	*102*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:39*	*1*
13C5 PFNA	*103*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:39*	*1*
13C2 PFDA	*98*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:39*	*1*
13C2 PFUnA	*92*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:39*	*1*
13C2 PFDoA	*88*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:39*	*1*
13C2 PFTeDA	*90*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:39*	*1*
13C3 PFBS	*85*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:39*	*1*
18O2 PFHxS	*100*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:39*	*1*
13C4 PFOS	*99*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:39*	*1*
d3-NMeFOSAA	*69*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:39*	*1*
d5-NEtFOSAA	*70*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:39*	*1*
13C3 HFPO-DA	*87*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:39*	*1*

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66143-1

Client Sample ID: 3-21-TWP-01
Date Collected: 10/26/20 19:04
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66143-8
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**9.6**		2.0	0.57	ng/L		10/30/20 11:25	11/01/20 08:48	1
Perfluoroheptanoic acid (PFHpA)	**3.6**		2.0	0.25	ng/L		10/30/20 11:25	11/01/20 08:48	1
Perfluorooctanoic acid (PFOA)	**3.3**		2.0	0.84	ng/L		10/30/20 11:25	11/01/20 08:48	1
Perfluorononanoic acid (PFNA)	**0.42**	**J**	2.0	0.27	ng/L		10/30/20 11:25	11/01/20 08:48	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.31	ng/L		10/30/20 11:25	11/01/20 08:48	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		10/30/20 11:25	11/01/20 08:48	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.54	ng/L		10/30/20 11:25	11/01/20 08:48	1
Perfluorotridecanoic acid (PFTriA)	ND		2.0	1.3	ng/L		10/30/20 11:25	11/01/20 08:48	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.72	ng/L		10/30/20 11:25	11/01/20 08:48	1
Perfluorobutanesulfonic acid (PFBS)	**1.5**	**J**	2.0	0.20	ng/L		10/30/20 11:25	11/01/20 08:48	1
Perfluorohexanesulfonic acid (PFHxS)	**12**		2.0	0.56	ng/L		10/30/20 11:25	11/01/20 08:48	1
Perfluorooctanesulfonic acid (PFOS)	**11**	**B**	2.0	0.53	ng/L		10/30/20 11:25	11/01/20 08:48	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.9	1.2	ng/L		10/30/20 11:25	11/01/20 08:48	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.9	1.3	ng/L		10/30/20 11:25	11/01/20 08:48	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.0	0.24	ng/L		10/30/20 11:25	11/01/20 08:48	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		4.0	1.5	ng/L		10/30/20 11:25	11/01/20 08:48	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.0	0.32	ng/L		10/30/20 11:25	11/01/20 08:48	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0	0.40	ng/L		10/30/20 11:25	11/01/20 08:48	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*79*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:48*	*1*
13C4 PFHpA	*91*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:48*	*1*
13C4 PFOA	*97*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:48*	*1*
13C5 PFNA	*89*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:48*	*1*
13C2 PFDA	*81*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:48*	*1*
13C2 PFUnA	*74*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:48*	*1*
13C2 PFDoA	*72*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:48*	*1*
13C2 PFTeDA	*77*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:48*	*1*
13C3 PFBS	*75*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:48*	*1*
18O2 PFHxS	*92*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:48*	*1*
13C4 PFOS	*83*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:48*	*1*
d3-NMeFOSAA	*58*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:48*	*1*
d5-NEtFOSAA	*56*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:48*	*1*
13C3 HFPO-DA	*75*		*25 - 150*	*10/30/20 11:25*	*11/01/20 08:48*	*1*

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66143-1

Client Sample ID: LNDFL-TWP-01

Date Collected: 10/26/20 13:05
Date Received: 10/29/20 10:55

Lab Sample ID: 320-66143-9

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**17**		2.0	0.58	ng/L		10/30/20 11:25	11/01/20 09:16	1
Perfluoroheptanoic acid (PFHpA)	**4.9**		2.0	0.25	ng/L		10/30/20 11:25	11/01/20 09:16	1
Perfluorooctanoic acid (PFOA)	**3.6**		2.0	0.85	ng/L		10/30/20 11:25	11/01/20 09:16	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.27	ng/L		10/30/20 11:25	11/01/20 09:16	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.31	ng/L		10/30/20 11:25	11/01/20 09:16	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		10/30/20 11:25	11/01/20 09:16	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.55	ng/L		10/30/20 11:25	11/01/20 09:16	1
Perfluorotridecanoic acid (PFTriA)	ND		2.0	1.3	ng/L		10/30/20 11:25	11/01/20 09:16	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.73	ng/L		10/30/20 11:25	11/01/20 09:16	1
Perfluorobutanesulfonic acid (PFBS)	**4.5**		2.0	0.20	ng/L		10/30/20 11:25	11/01/20 09:16	1
Perfluorohexanesulfonic acid (PFHxS)	**19**		2.0	0.57	ng/L		10/30/20 11:25	11/01/20 09:16	1
Perfluorooctanesulfonic acid (PFOS)	**6.6**	**B**	2.0	0.54	ng/L		10/30/20 11:25	11/01/20 09:16	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		5.0	1.2	ng/L		10/30/20 11:25	11/01/20 09:16	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		5.0	1.3	ng/L		10/30/20 11:25	11/01/20 09:16	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.0	0.24	ng/L		10/30/20 11:25	11/01/20 09:16	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		4.0	1.5	ng/L		10/30/20 11:25	11/01/20 09:16	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.0	0.32	ng/L		10/30/20 11:25	11/01/20 09:16	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0	0.40	ng/L		10/30/20 11:25	11/01/20 09:16	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*80*		*25 - 150*	*10/30/20 11:25*	*11/01/20 09:16*	*1*
13C4 PFHpA	*90*		*25 - 150*	*10/30/20 11:25*	*11/01/20 09:16*	*1*
13C4 PFOA	*94*		*25 - 150*	*10/30/20 11:25*	*11/01/20 09:16*	*1*
13C5 PFNA	*95*		*25 - 150*	*10/30/20 11:25*	*11/01/20 09:16*	*1*
13C2 PFDA	*88*		*25 - 150*	*10/30/20 11:25*	*11/01/20 09:16*	*1*
13C2 PFUnA	*84*		*25 - 150*	*10/30/20 11:25*	*11/01/20 09:16*	*1*
13C2 PFDoA	*81*		*25 - 150*	*10/30/20 11:25*	*11/01/20 09:16*	*1*
13C2 PFTeDA	*84*		*25 - 150*	*10/30/20 11:25*	*11/01/20 09:16*	*1*
13C3 PFBS	*74*		*25 - 150*	*10/30/20 11:25*	*11/01/20 09:16*	*1*
18O2 PFHxS	*91*		*25 - 150*	*10/30/20 11:25*	*11/01/20 09:16*	*1*
13C4 PFOS	*91*		*25 - 150*	*10/30/20 11:25*	*11/01/20 09:16*	*1*
d3-NMeFOSAA	*62*		*25 - 150*	*10/30/20 11:25*	*11/01/20 09:16*	*1*
d5-NEtFOSAA	*64*		*25 - 150*	*10/30/20 11:25*	*11/01/20 09:16*	*1*
13C3 HFPO-DA	*69*		*25 - 150*	*10/30/20 11:25*	*11/01/20 09:16*	*1*

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66143-1

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)	PFDoA (25-150)	PFTDA (25-150)
280-142031-A-2-A MS	Matrix Spike	89	88	96	89	86	89	74	77
280-142031-A-2-B MSD	Matrix Spike Duplicate	85	84	92	85	83	76	75	68
320-66143-1	3-21-TWP-04	92	100	104	102	97	88	88	91
320-66143-2	3-21-TWP-05	93	98	108	103	96	86	79	81
320-66143-3	10-28-TWP-02	93	99	105	102	94	85	84	89
320-66143-4	10-28-TWP-05	87	96	105	102	96	91	88	86
320-66143-5	10-28-TWP-06	90	96	107	103	101	98	86	84
320-66143-6	10-28-TWP-07	98	106	111	103	103	97	96	96
320-66143-7	10-28-TWP-08	94	102	102	103	98	92	88	90
320-66143-8	3-21-TWP-01	79	91	97	89	81	74	72	77
320-66143-9	LNDFL-TWP-01	80	90	94	95	88	84	81	84
LCS 320-426936/2-A	Lab Control Sample	77	79	85	84	84	83	85	80
MB 320-426936/1-A	Method Blank	73	79	84	82	77	80	78	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)		
280-142031-A-2-A MS	Matrix Spike	93	96	98	98	115	83		
280-142031-A-2-B MSD	Matrix Spike Duplicate	90	91	89	109	105	84		
320-66143-1	3-21-TWP-04	89	100	96	70	71	86		
320-66143-2	3-21-TWP-05	89	100	95	65	67	87		
320-66143-3	10-28-TWP-02	88	96	95	66	70	86		
320-66143-4	10-28-TWP-05	80	94	97	70	68	81		
320-66143-5	10-28-TWP-06	80	95	100	72	76	84		
320-66143-6	10-28-TWP-07	89	99	102	76	79	86		
320-66143-7	10-28-TWP-08	85	100	99	69	70	87		
320-66143-8	3-21-TWP-01	75	92	83	58	56	75		
320-66143-9	LNDFL-TWP-01	74	91	91	62	64	69		
LCS 320-426936/2-A	Lab Control Sample	75	78	81	66	68	76		
MB 320-426936/1-A	Method Blank	71	78	79	62	64	70		

Surrogate Legend

PFHxA = 13C2 PFHxA
C4PFHA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA
PFUnA = 13C2 PFUnA
PFDoA = 13C2 PFDoA
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

Lab Sample ID: MB 320-426936/1-A
Matrix: Water
Analysis Batch: 427417

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 426936

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.58	ng/L		10/30/20 11:25	11/01/20 05:32	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.25	ng/L		10/30/20 11:25	11/01/20 05:32	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.85	ng/L		10/30/20 11:25	11/01/20 05:32	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.27	ng/L		10/30/20 11:25	11/01/20 05:32	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.31	ng/L		10/30/20 11:25	11/01/20 05:32	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		10/30/20 11:25	11/01/20 05:32	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.55	ng/L		10/30/20 11:25	11/01/20 05:32	1
Perfluorotridecanoic acid (PFTriA)	ND		2.0	1.3	ng/L		10/30/20 11:25	11/01/20 05:32	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.73	ng/L		10/30/20 11:25	11/01/20 05:32	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.20	ng/L		10/30/20 11:25	11/01/20 05:32	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.57	ng/L		10/30/20 11:25	11/01/20 05:32	1
Perfluorooctanesulfonic acid (PFOS)	0.629	J	2.0	0.54	ng/L		10/30/20 11:25	11/01/20 05:32	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		5.0	1.2	ng/L		10/30/20 11:25	11/01/20 05:32	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		5.0	1.3	ng/L		10/30/20 11:25	11/01/20 05:32	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.0	0.24	ng/L		10/30/20 11:25	11/01/20 05:32	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		4.0	1.5	ng/L		10/30/20 11:25	11/01/20 05:32	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.0	0.32	ng/L		10/30/20 11:25	11/01/20 05:32	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0	0.40	ng/L		10/30/20 11:25	11/01/20 05:32	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*73*		*25 - 150*	*10/30/20 11:25*	*11/01/20 05:32*	*1*
13C4 PFHpA	*79*		*25 - 150*	*10/30/20 11:25*	*11/01/20 05:32*	*1*
13C4 PFOA	*84*		*25 - 150*	*10/30/20 11:25*	*11/01/20 05:32*	*1*
13C5 PFNA	*82*		*25 - 150*	*10/30/20 11:25*	*11/01/20 05:32*	*1*
13C2 PFDA	*77*		*25 - 150*	*10/30/20 11:25*	*11/01/20 05:32*	*1*
13C2 PFUnA	*80*		*25 - 150*	*10/30/20 11:25*	*11/01/20 05:32*	*1*
13C2 PFDoA	*78*		*25 - 150*	*10/30/20 11:25*	*11/01/20 05:32*	*1*
13C2 PFTeDA	*83*		*25 - 150*	*10/30/20 11:25*	*11/01/20 05:32*	*1*
13C3 PFBS	*71*		*25 - 150*	*10/30/20 11:25*	*11/01/20 05:32*	*1*
18O2 PFHxS	*78*		*25 - 150*	*10/30/20 11:25*	*11/01/20 05:32*	*1*
13C4 PFOS	*79*		*25 - 150*	*10/30/20 11:25*	*11/01/20 05:32*	*1*
d3-NMeFOSAA	*62*		*25 - 150*	*10/30/20 11:25*	*11/01/20 05:32*	*1*
d5-NEtFOSAA	*64*		*25 - 150*	*10/30/20 11:25*	*11/01/20 05:32*	*1*
13C3 HFPO-DA	*70*		*25 - 150*	*10/30/20 11:25*	*11/01/20 05:32*	*1*

Lab Sample ID: LCS 320-426936/2-A
Matrix: Water
Analysis Batch: 427417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 426936

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	40.0	41.9		ng/L		105	73 - 133
Perfluoroheptanoic acid (PFHpA)	40.0	45.2		ng/L		113	72 - 132
Perfluorooctanoic acid (PFOA)	40.0	41.2		ng/L		103	70 - 130
Perfluorononanoic acid (PFNA)	40.0	44.4		ng/L		111	75 - 135

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-426936/2-A
Matrix: Water
Analysis Batch: 427417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 426936

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorodecanoic acid (PFDA)	40.0	43.2		ng/L		108	76 - 136
Perfluoroundecanoic acid (PFUnA)	40.0	45.7		ng/L		114	68 - 128
Perfluorododecanoic acid (PFDoA)	40.0	43.3		ng/L		108	71 - 131
Perfluorotridecanoic acid (PFTriA)	40.0	40.7		ng/L		102	71 - 131
Perfluorotetradecanoic acid (PFTeA)	40.0	44.9		ng/L		112	70 - 130
Perfluorobutanesulfonic acid (PFBS)	35.4	38.9		ng/L		110	67 - 127
Perfluorohexanesulfonic acid (PFHxS)	36.4	36.9		ng/L		101	59 - 119
Perfluorooctanesulfonic acid (PFOS)	37.1	39.9		ng/L		108	70 - 130
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	37.3	40.4		ng/L		108	75 - 135
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	40.0	39.9		ng/L		100	51 - 173
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	37.7	40.3		ng/L		107	54 - 114
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	37.7	42.7		ng/L		113	79 - 139

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*77*		*25 - 150*
13C4 PFHpA	*79*		*25 - 150*
13C4 PFOA	*85*		*25 - 150*
13C5 PFNA	*84*		*25 - 150*
13C2 PFDA	*84*		*25 - 150*
13C2 PFUnA	*83*		*25 - 150*
13C2 PFDoA	*85*		*25 - 150*
13C2 PFTeDA	*80*		*25 - 150*
13C3 PFBS	*75*		*25 - 150*
18O2 PFHxS	*78*		*25 - 150*
13C4 PFOS	*81*		*25 - 150*
d3-NMeFOSAA	*66*		*25 - 150*
d5-NEtFOSAA	*68*		*25 - 150*
13C3 HFPO-DA	*76*		*25 - 150*

Lab Sample ID: 280-142031-A-2-A MS
Matrix: Water
Analysis Batch: 427560

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 426936

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	57		35.9	86.4		ng/L		81	73 - 133
Perfluoroheptanoic acid (PFHpA)	13	J	35.9	51.4		ng/L		107	72 - 132
Perfluorooctanoic acid (PFOA)	18	J	35.9	50.9		ng/L		93	70 - 130
Perfluorononanoic acid (PFNA)	26		35.9	63.0		ng/L		102	75 - 135
Perfluorodecanoic acid (PFDA)	ND		35.9	38.9		ng/L		109	76 - 136
Perfluoroundecanoic acid (PFUnA)	ND		35.9	38.1		ng/L		106	68 - 128

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 280-142031-A-2-A MS
Matrix: Water
Analysis Batch: 427560

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 426936

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorododecanoic acid (PFDoA)	ND		35.9	36.1		ng/L		101	71 - 131
Perfluorotridecanoic acid (PFTriA)	ND		35.9	34.3		ng/L		96	71 - 131
Perfluorotetradecanoic acid (PFTeA)	ND		35.9	38.6		ng/L		108	70 - 130
Perfluorobutanesulfonic acid (PFBS)	35		31.7	64.1		ng/L		92	67 - 127
Perfluorohexanesulfonic acid (PFHxS)	180		32.6	185	4	ng/L		21	59 - 119
Perfluorooctanesulfonic acid (PFOS)	140	B	33.3	163	4	ng/L		80	70 - 130
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		33.4	29.5		ng/L		88	75 - 135
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		35.9	36.7		ng/L		102	51 - 173
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		33.8	32.0		ng/L		95	54 - 114
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		33.8	33.0		ng/L		98	79 - 139

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C2 PFHxA	*89*		*25 - 150*
13C4 PFHpA	*88*		*25 - 150*
13C4 PFOA	*96*		*25 - 150*
13C5 PFNA	*89*		*25 - 150*
13C2 PFDA	*86*		*25 - 150*
13C2 PFUnA	*89*		*25 - 150*
13C2 PFDoA	*74*		*25 - 150*
13C2 PFTeDA	*77*		*25 - 150*
13C3 PFBS	*93*		*25 - 150*
18O2 PFHxS	*96*		*25 - 150*
13C4 PFOS	*98*		*25 - 150*
d3-NMeFOSAA	*98*		*25 - 150*
d5-NEtFOSAA	*115*		*25 - 150*
13C3 HFPO-DA	*83*		*25 - 150*

Lab Sample ID: 280-142031-A-2-B MSD
Matrix: Water
Analysis Batch: 427560

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 426936

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	57		35.6	87.5		ng/L		85	73 - 133	1	30
Perfluoroheptanoic acid (PFHpA)	13	J	35.6	50.3		ng/L		104	72 - 132	2	30
Perfluorooctanoic acid (PFOA)	18	J	35.6	49.6		ng/L		90	70 - 130	3	30
Perfluorononanoic acid (PFNA)	26		35.6	59.9		ng/L		94	75 - 135	5	30
Perfluorodecanoic acid (PFDA)	ND		35.6	41.1		ng/L		115	76 - 136	5	30
Perfluoroundecanoic acid (PFUnA)	ND		35.6	36.9		ng/L		104	68 - 128	3	30
Perfluorododecanoic acid (PFDoA)	ND		35.6	35.3		ng/L		99	71 - 131	2	30

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 280-142031-A-2-B MSD
Matrix: Water
Analysis Batch: 427560

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 426936

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorotridecanoic acid (PFTriA)	ND		35.6	31.5		ng/L		88	71 - 131	9	30
Perfluorotetradecanoic acid (PFTeA)	ND		35.6	38.3		ng/L		108	70 - 130	1	30
Perfluorobutanesulfonic acid (PFBS)	35		31.5	69.8		ng/L		111	67 - 127	9	30
Perfluorohexanesulfonic acid (PFHxS)	180		32.4	202	4	ng/L		76	59 - 119	9	30
Perfluorooctanesulfonic acid (PFOS)	140	B	33.1	158	4	ng/L		65	70 - 130	3	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		33.2	33.2		ng/L		100	75 - 135	12	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		35.6	32.7	J	ng/L		92	51 - 173	12	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		33.6	31.5		ng/L		94	54 - 114	2	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		33.6	36.1		ng/L		108	79 - 139	9	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C2 PFHxA	*85*		*25 - 150*
13C4 PFHpA	*84*		*25 - 150*
13C4 PFOA	*92*		*25 - 150*
13C5 PFNA	*85*		*25 - 150*
13C2 PFDA	*83*		*25 - 150*
13C2 PFUnA	*76*		*25 - 150*
13C2 PFDoA	*75*		*25 - 150*
13C2 PFTeDA	*68*		*25 - 150*
13C3 PFBS	*90*		*25 - 150*
18O2 PFHxS	*91*		*25 - 150*
13C4 PFOS	*89*		*25 - 150*
d3-NMeFOSAA	*109*		*25 - 150*
d5-NEtFOSAA	*105*		*25 - 150*
13C3 HFPO-DA	*84*		*25 - 150*

LCMS

Prep Batch: 426936

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66143-1	3-21-TWP-04	Total/NA	Water	3535	
320-66143-2	3-21-TWP-05	Total/NA	Water	3535	
320-66143-3	10-28-TWP-02	Total/NA	Water	3535	
320-66143-4	10-28-TWP-05	Total/NA	Water	3535	
320-66143-5	10-28-TWP-06	Total/NA	Water	3535	
320-66143-6	10-28-TWP-07	Total/NA	Water	3535	
320-66143-7	10-28-TWP-08	Total/NA	Water	3535	
320-66143-8	3-21-TWP-01	Total/NA	Water	3535	
320-66143-9	LNDFL-TWP-01	Total/NA	Water	3535	
MB 320-426936/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-426936/2-A	Lab Control Sample	Total/NA	Water	3535	
280-142031-A-2-A MS	Matrix Spike	Total/NA	Water	3535	
280-142031-A-2-B MSD	Matrix Spike Duplicate	Total/NA	Water	3535	

Analysis Batch: 427417

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66143-1	3-21-TWP-04	Total/NA	Water	537 (modified)	426936
320-66143-2	3-21-TWP-05	Total/NA	Water	537 (modified)	426936
320-66143-3	10-28-TWP-02	Total/NA	Water	537 (modified)	426936
320-66143-4	10-28-TWP-05	Total/NA	Water	537 (modified)	426936
320-66143-5	10-28-TWP-06	Total/NA	Water	537 (modified)	426936
320-66143-6	10-28-TWP-07	Total/NA	Water	537 (modified)	426936
320-66143-7	10-28-TWP-08	Total/NA	Water	537 (modified)	426936
320-66143-8	3-21-TWP-01	Total/NA	Water	537 (modified)	426936
320-66143-9	LNDFL-TWP-01	Total/NA	Water	537 (modified)	426936
MB 320-426936/1-A	Method Blank	Total/NA	Water	537 (modified)	426936
LCS 320-426936/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	426936

Analysis Batch: 427560

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-142031-A-2-A MS	Matrix Spike	Total/NA	Water	537 (modified)	426936
280-142031-A-2-B MSD	Matrix Spike Duplicate	Total/NA	Water	537 (modified)	426936

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66143-1

Client Sample ID: 3-21-TWP-04
Lab Sample ID: 320-66143-1
Date Collected: 10/24/20 18:40
Matrix: Water
Date Received: 10/29/20 10:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			266.9 mL	10.0 mL	426936	10/30/20 11:25	SAD	TAL SAC
Total/NA	Analysis	537 (modified)		1			427417	11/01/20 07:43	D1R	TAL SAC

Client Sample ID: 3-21-TWP-05
Lab Sample ID: 320-66143-2
Date Collected: 10/24/20 18:30
Matrix: Water
Date Received: 10/29/20 10:55

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 mL	10.0 mL	426936	10/30/20 11:25	SAD	TAL SAC
Total/NA	Analysis	537 (modified)		1			427417	11/01/20 07:52	D1R	TAL SAC

Client Sample ID: 10-28-TWP-02
Lab Sample ID: 320-66143-3
Date Collected: 10/25/20 11:39
Matrix: Water
Date Received: 10/29/20 10:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			259.7 mL	10.0 mL	426936	10/30/20 11:25	SAD	TAL SAC
Total/NA	Analysis	537 (modified)		1			427417	11/01/20 08:02	D1R	TAL SAC

Client Sample ID: 10-28-TWP-05
Lab Sample ID: 320-66143-4
Date Collected: 10/25/20 15:03
Matrix: Water
Date Received: 10/29/20 10:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			242 mL	10.0 mL	426936	10/30/20 11:25	SAD	TAL SAC
Total/NA	Analysis	537 (modified)		1			427417	11/01/20 08:11	D1R	TAL SAC

Client Sample ID: 10-28-TWP-06
Lab Sample ID: 320-66143-5
Date Collected: 10/25/20 14:53
Matrix: Water
Date Received: 10/29/20 10:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			266.2 mL	10.0 mL	426936	10/30/20 11:25	SAD	TAL SAC
Total/NA	Analysis	537 (modified)		1			427417	11/01/20 08:20	D1R	TAL SAC

Client Sample ID: 10-28-TWP-07
Lab Sample ID: 320-66143-6
Date Collected: 10/26/20 17:05
Matrix: Water
Date Received: 10/29/20 10:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			264.8 mL	10.0 mL	426936	10/30/20 11:25	SAD	TAL SAC
Total/NA	Analysis	537 (modified)		1			427417	11/01/20 08:30	D1R	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66143-1

Client Sample ID: 10-28-TWP-08

Lab Sample ID: 320-66143-7

Date Collected: 10/26/20 17:10

Matrix: Water

Date Received: 10/29/20 10:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			271.3 mL	10.0 mL	426936	10/30/20 11:25	SAD	TAL SAC
Total/NA	Analysis	537 (modified)		1			427417	11/01/20 08:39	D1R	TAL SAC

Client Sample ID: 3-21-TWP-01

Lab Sample ID: 320-66143-8

Date Collected: 10/26/20 19:04

Matrix: Water

Date Received: 10/29/20 10:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			252.9 mL	10.0 mL	426936	10/30/20 11:25	SAD	TAL SAC
Total/NA	Analysis	537 (modified)		1			427417	11/01/20 08:48	D1R	TAL SAC

Client Sample ID: LNDFL-TWP-01

Lab Sample ID: 320-66143-9

Date Collected: 10/26/20 13:05

Matrix: Water

Date Received: 10/29/20 10:55

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			250.1 mL	10.0 mL	426936	10/30/20 11:25	SAD	TAL SAC
Total/NA	Analysis	537 (modified)		1			427417	11/01/20 09:16	D1R	TAL SAC

Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66143-1

Laboratory: Eurofins TestAmerica, Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	01-20-21
ANAB	Dept. of Defense ELAP	L2468	01-20-21
ANAB	Dept. of Energy	L2468.01	01-20-21
ANAB	ISO/IEC 17025	L2468	01-20-21
Arizona	State	AZ0708	08-11-21
Arkansas DEQ	State	88-0691	06-17-21
California	State	2897	01-31-22
Colorado	State	CA0004	08-31-21
Connecticut	State	PH-0691	06-30-21
Florida	NELAP	E87570	06-30-21
Georgia	State	4040	01-30-21
Hawaii	State	<cert No.>	01-29-21
Illinois	NELAP	200060	03-17-21
Kansas	NELAP	E-10375	10-31-20 *
Louisiana	NELAP	01944	06-30-21
Maine	State	CA00004	04-14-22
Michigan	State	9947	08-03-23
Nevada	State	CA000442021-1	07-31-21
New Hampshire	NELAP	2997	04-18-21
New Jersey	NELAP	CA005	06-30-21
New York	NELAP	11666	04-01-21
Oregon	NELAP	4040	01-29-21
Pennsylvania	NELAP	68-01272	03-31-21
Texas	NELAP	T104704399-19-13	06-01-21
US Fish & Wildlife	US Federal Programs	58448	07-31-21
USDA	US Federal Programs	P330-18-00239	07-31-21
Utah	NELAP	CA000442019-01	02-28-21
Vermont	State	VT-4040	04-16-21
Virginia	NELAP	460278	03-14-21
Washington	State	C581	05-05-21
West Virginia (DW)	State	9930C	12-31-20
Wisconsin	State	998204680	08-31-21
Wyoming	State Program	8TMS-L	01-28-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66143-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
3535	Solid-Phase Extraction (SPE)	SW846	TAL 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:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Shannon & Wilson, Inc
Project/Site: OME

Job ID: 320-66143-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
320-66143-1	3-21-TWP-04	Water	10/24/20 18:40	10/29/20 10:55	
320-66143-2	3-21-TWP-05	Water	10/24/20 18:30	10/29/20 10:55	
320-66143-3	10-28-TWP-02	Water	10/25/20 11:39	10/29/20 10:55	
320-66143-4	10-28-TWP-05	Water	10/25/20 15:03	10/29/20 10:55	
320-66143-5	10-28-TWP-06	Water	10/25/20 14:53	10/29/20 10:55	
320-66143-6	10-28-TWP-07	Water	10/26/20 17:05	10/29/20 10:55	
320-66143-7	10-28-TWP-08	Water	10/26/20 17:10	10/29/20 10:55	
320-66143-8	3-21-TWP-01	Water	10/26/20 19:04	10/29/20 10:55	
320-66143-9	LNDFL-TWP-01	Water	10/26/20 13:05	10/29/20 10:55	

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600
www.shannonwilson.com

CHAIN-OF-CUSTODY RECORD

Laboratory Test America
Attn: David Acctucker

Analytical Methods (include preservative if used)

Turn Around Time:	Quote No:	J-Flags:
☒ Normal ☐ Rush	—	☒ Yes ☐ No
Please Specify		

320-66143 Chain of Custody

Sample Identity	Lab No.	Time	Date Sampled	PFAS x18 (537 + M)	Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
3-21-TWP-04		1840	10/24/20	X	2	groundwater
3-21-TWP-05		1830	↓	X	2	↓
10-28-TWP-02		1139	10/25/20	X	2	
10-28-TWP-05		1503	↓	X	2	
10-28-TWP-06		1453	↓	X	2	
10-28-TWP-07		1705	10/26/20	X	2	
10-28-TWP-08		1710	10/26/20	X	2	
3-21-TWP-01		1904	↓	X	2	
LNDFL-TWP-01		1305	↓	X	2	↓

Project Information		Sample Receipt	
Number:	105745-002	Total No. of Containers:	18
Name:	OME	COC Seals/Intact? Y/N/NA	
Contact:	MDN	Received Good Cond./Cold	
Ongoing Project?	Yes ☒ No ☐	Temp:	
Sampler:	VTY, MDN	Delivery Method:	Goldstreak

Notes:

Please bill to 105745-002

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: [signature] Time: 1600	Signature: Time:	Signature: Time:
Printed Name: Veselina Yakimova Date: 10/27/20	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: [signature] Time: 855	Signature: Time:	Signature: Time:
Printed Name: Jennifer Arlington Date: 10/27/20	Printed Name: Date:	Printed Name: Date:
Company: GTAW SMC	Company:	Company:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

1.6°C

No. 36148

Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 320-66143-1

Login Number: 66143
List Number: 1
Creator: Oropeza, Salvador

List Source: Eurofins TestAmerica, Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	Seals
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	GEL PACKS ONLY
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 <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Laboratory Data Review Checklist

Completed By:

Veselina Yakimova

Title:

Geologist

Date:

November 9, 2020

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

Eurofins / TestAmerica Laboratories, Inc.

Laboratory Report Number:

320-66143-1

Laboratory Report Date:

November 4, 2020

CS Site Name:

Nome Airport Statewide PFAS

ADEC File Number:

400.38.056

Hazard Identification Number:

27154

320-66143-1

Laboratory Report Date:

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☒ No☐ N/A☐ Comments:

   The DEC certified TestAmerica of West Sacramento, CA for the analysis of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) on February 6, 2018 by method 537. These compounds were included in the DEC's Contaminated Sites Laboratory Approval 17-020.

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☐ No☐ N/A☒ Comments:

   The requested analyses were conducted by the TestAmerica laboratory in West Sacramento, CA.

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:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☐ No☐ N/A☒ Comments:

   PFAS samples do not require preservation other than temperature.

   c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

   Yes☒ No☐ N/A☐ Comments:

   The sample receipt form notes that the samples were received 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:

No discrepancies were noted by the laboratory in the sample receipt documentation.

e. Data quality or usability affected?

Comments:

The data quality and/or usability was not affected; see above.

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 laboratory applied an 'I' qualifier to the PFOS results of samples *10-28-TWP-05* and *10-28-TWP-06* to indicate the transition mass ratio was outside established ratio limits.

MS/MSD samples were prepared with extraction batch 426936, but as the sample that was used for the spike was from a different job; data does not appear in this report.

Samples *3-21-TWP-01* and *LNDFL-TWP-01* contained a thin layer of sediment at the bottom of the bottle prior to extraction.

Samples *3-21-TWP-01* and *LNDFL-TWP-01* contain non-settable particulates which clogged the solid phase extraction column.

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

No corrective actions were documented in the case narrative.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

The laboratory qualified the PFOS results of the samples *10-28-TWP-05* and *10-28-TWP-06* with the I-flag due to the qualitative way in which the analyte was identified.

320-66143-1

Laboratory Report Date:

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:

Soil samples were not submitted with this work order.

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☒ No☐ N/A☐ Comments:

The reporting limit (RL) is less than the applicable ADEC regulatory limit for the project.

e. Data quality or usability affected?

The data quality and/or usability was not affected; see above.

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 limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

There were no detections above LOQ in the method blank; however, PFOS was detected below the LOQ in the method blank associated with preparation batch 426936.

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

All field samples reported in this work order are included in preparation batch 426936. Of the included samples, only *10-28-TWP-02*, *10-28-TWP-07*, and *10-28-TWP-08* contained PFOS concentrations within ten times that of the concentration detected in the method blank.

Laboratory Report Date:

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

The PFOS results of the samples *10-28-TWP-02, 10-28-TWP-07,* and *10-28-TWP-08* are considered to be impacted by external contamination and have been flagged 'UB' at the LOQ or detected concentration (whichever is greater) in the analytical tables.

v. Data quality or usability affected?

Comments:

The data quality/usability is affected; see above.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

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:

Metals/Inorganics were not analyzed as part of this work order.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

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. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☐ No☐ N/A☒ Comments:

An LCSD was not reported with this preparation batch. See the MS/MSD discussion for assessment of method precision.

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

NA; 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 of the data was not required; see above.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and/or usability was not affected; see above.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

Metals/Inorganics were not analyzed as part of 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 recoveries of perfluorohexanesulfonic acid (PFHxS) and PFOS were below their lower control limits in the MS or MSD samples associated with preparation batch 426936.

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 from which the MS/MSD samples were spiked was not included in this work order. Additionally, the spiking concentrations added to the matrix were low relative to the native concentrations in the parent sample. The uncertainty introduced into the recovery calculations may render the MS/MSD results unrepresentative of actual method performance.

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 and/or usability was not 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:

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:

There were no IDA recovery failures associated with this work order.

iv. Data quality or usability affected?

Comments:

The data quality and/or usability was 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. A trip blank is not required for the requested analysis.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes☐ No☐ N/A☒ Comments:

A trip blank is not required for the requested analysis.

iii. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

A trip blank is not required for the requested analysis.

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

N/A; a trip blank is not required for the requested analysis.

v. Data quality or usability affected?

Comments:

The data quality and/or usability was not affected; see above.

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☒ No☐ N/A☐ Comments:

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

The field duplicate pairs *3-21-TWP-04 / 3-21-TWP-05, 10-28-TWP-07 / 10-28-TWP-08,* and *10-28-TWP-05 / 10-28-TWP-06* were submitted with this work order.

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

RPD (%) = 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:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

The data quality and/or usability was not affected; see above.

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☐ N/A☒ Comments:

Reusable equipment was not utilized during the sample collection process for the field samples included in this work order.

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

No equipment blank was submitted with this work order.

Laboratory Report Date:

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

N/A; an equipment blank was not required.

iii. Data quality or usability affected?

Comments:

The data quality/usability is not affected; see above.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes☒ No☐ N/A☐ Comments:

The PFOS results of the samples *10-28-TWP-05* and *10-28-TWP-06* are considered estimated and flagged 'J' because the transition mass ratio did not meet laboratory acceptance criteria. The laboratory analyst used professional judgement to identify the analyte but there is some degree of uncertainty in this determination.

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

Laboratory Job ID: 320-66250-1
Client Project/Site: Nome DOT&PF

For:
Shannon & Wilson, Inc
2355 Hill Rd.
Fairbanks, Alaska 99709-5244

Attn: Marcy Nadel

Authorized for release by:
11/16/2020 12:32:15 PM

David Alltucker, Project Manager I
(916)374-4383
David.Alltucker@Eurofinset.com

Table of Contents

Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Qualifiers

LCMS

Qualifier	Qualifier Description
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.
¤	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

Job ID: 320-66250-1

Laboratory: Eurofins TestAmerica, Sacramento

Narrative

Job Narrative
320-66250-1

Receipt
The samples were received on 11/3/2020 12:10 PM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.0º C.

LCMS
Method 537 (modified): The "I" qualifier means the transition mass ratio for the indicated analyte(s) was outside of the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty. However, analyst judgement was used to positively identify the analyte. SS-20 (320-66250-13),SS-23 (320-66250-16), and AKA-SB1-01 (320-66250-25).

Method 537 (modified): The concentration of Perfluorooctanesulfonic acid (PFOS) associated with the following sample exceeded the instrument calibration range: SS-13 (320-66250-6). 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.

Method 537 (modified): The concentration of Perfluorooctanesulfonic acid (PFOS) associated with the following samples exceeded the instrument calibration range: AKA-SB1-02 (320-66250-26) and AKA-SB1-12 (320-66250-27). The 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, therefore the data has been reported.

Method 537 (modified): The matrix spike(MS) recoveries for preparation batch 320-430058 and analytical batch 320-431265 were outside control limits for Perfluorohexanesulfonic acid (PFHxS) and Perfluorodecanoic acid (PFDA). 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 duplicate (MSD) recoveries for preparation batch 320-430058 and analytical batch 320-431265 were outside control limits for several analytes. 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 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 320-428478 and 320-428478.

Method SHAKE: The following samples were light yellow after final volume/extraction: SS-08 (320-66250-1), SS-09 (320-66250-2), SS-13 (320-66250-6), SS-14 (320-66250-7), SS-15 (320-66250-8), SS-16 (320-66250-9), (320-66250-A-1 MS) and (320-66250-A-1 MSD).

Method SHAKE: The following samples were yellow and cloudy after final volume/extraction: SS-10 (320-66250-3), SS-11 (320-66250-4) and SS-12 (320-66250-5).

Method SHAKE: The following samples were yellow after final volume/extraction: SS-18 (320-66250-11), SS-20 (320-66250-13), SS-23 (320-66250-16) and SS-24 (320-66250-17).

Method SHAKE: The following sample was cloudy after final volume/extraction: SS-25 (320-66250-18).

Method SHAKE: The following sample was yellow after extraction: SS-28 (320-66250-21).

Method SHAKE: The following samples were yellow after extraction: SS-29 (320-66250-22) and SS-30 (320-66250-23).

Job ID: 320-66250-1 (Continued)

Laboratory: Eurofins TestAmerica, Sacramento (Continued)

Method SHAKE: The following sample was yellow and cloudy after extraction: SS-31 (320-66250-24).

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: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-08 — Lab Sample ID: 320-66250-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.58		0.24	0.050	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.18	J	0.24	0.034	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.0		0.24	0.10	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.77		0.24	0.043	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	4.4	F1	0.24	0.026	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.48		0.24	0.043	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorododecanoic acid (PFDoA)	1.4		0.24	0.079	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorotridecanoic acid (PFTriA)	0.36		0.24	0.060	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.84		0.24	0.064	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.083	J	0.24	0.030	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	3.7	F1	0.24	0.037	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	5.8	F1	0.59	0.24	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-09 — Lab Sample ID: 320-66250-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.30		0.22	0.046	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.062	J	0.22	0.031	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.28		0.22	0.093	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.061	J	0.22	0.039	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.028	J	0.22	0.027	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.76		0.22	0.034	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	4.5		0.54	0.22	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-10 — Lab Sample ID: 320-66250-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.32		0.20	0.042	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.087	J	0.20	0.029	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.099	J	0.20	0.086	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.073	J	0.20	0.022	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.26		0.20	0.031	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.6		0.50	0.20	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-11 — Lab Sample ID: 320-66250-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.25		0.20	0.043	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.069	J	0.20	0.030	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.069	J	0.20	0.023	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.24		0.20	0.032	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.6		0.51	0.20	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-12 — Lab Sample ID: 320-66250-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	5.6		0.20	0.043	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.12	J	0.20	0.030	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.13	J	0.20	0.088	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.084	J	0.20	0.023	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.35		0.20	0.026	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.58		0.20	0.032	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	3.7		0.51	0.20	ug/Kg	1	☼	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-13 — Lab Sample ID: 320-66250-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	1.3		0.24	0.050	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.41		0.24	0.034	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.9		0.24	0.10	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.38		0.24	0.043	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.29		0.24	0.026	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorododecanoic acid (PFDoA)	0.087	J	0.24	0.080	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.13	J	0.24	0.030	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	9.1		0.24	0.037	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	180	E	0.59	0.24	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-14 — Lab Sample ID: 320-66250-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.72		0.22	0.046	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.15	J	0.22	0.032	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.63		0.22	0.094	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.11	J	0.22	0.039	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.20	J	0.22	0.024	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.15	J	0.22	0.027	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	3.9		0.22	0.034	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	13		0.54	0.22	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-15 — Lab Sample ID: 320-66250-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.099	J	0.22	0.096	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.099	J	0.22	0.040	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.13	J	0.22	0.025	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.14	J	0.22	0.035	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	2.4		0.56	0.22	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-16 — Lab Sample ID: 320-66250-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.053	J	0.21	0.045	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.037	J	0.21	0.031	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.044	J	0.21	0.038	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.078	J	0.21	0.023	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.044	J	0.21	0.033	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.48	J	0.53	0.21	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-17 — Lab Sample ID: 320-66250-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorononanoic acid (PFNA)	0.041	J	0.21	0.037	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.084	J	0.21	0.032	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.5		0.52	0.21	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-18 — Lab Sample ID: 320-66250-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.12	J	0.20	0.032	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.6		0.51	0.20	ug/Kg	1	☼	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-19 — Lab Sample ID: 320-66250-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	0.31	J	0.53	0.21	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-20 — Lab Sample ID: 320-66250-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorodecanoic acid (PFDA)	0.034	J	0.21	0.023	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.051	J I	0.21	0.033	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.38	J	0.53	0.21	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-21 — Lab Sample ID: 320-66250-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorodecanoic acid (PFDA)	0.025	J	0.21	0.023	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.040	J	0.21	0.033	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.82		0.53	0.21	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-22 — Lab Sample ID: 320-66250-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.035	J	0.21	0.033	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.43	J	0.53	0.21	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-23 — Lab Sample ID: 320-66250-16

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorodecanoic acid (PFDA)	0.036	J I	0.28	0.030	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.068	J	0.28	0.043	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.2		0.69	0.28	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-24 — Lab Sample ID: 320-66250-17

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorononanoic acid (PFNA)	0.053	J	0.25	0.045	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.086	J	0.25	0.039	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.3		0.63	0.25	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-25 — Lab Sample ID: 320-66250-18

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.037	J	0.24	0.037	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.41	J	0.59	0.24	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-26 — Lab Sample ID: 320-66250-19

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorodecanoic acid (PFDA)	0.066	J	0.22	0.024	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.037	J	0.22	0.034	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.72	B	0.55	0.22	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-27 — Lab Sample ID: 320-66250-20

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorodecanoic acid (PFDA)	0.082	J	0.22	0.024	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.034	J	0.22	0.034	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.78	B	0.54	0.22	ug/Kg	1	☼	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-28 — Lab Sample ID: 320-66250-21

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.069	J	0.22	0.047	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.12	J	0.22	0.040	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.75		0.22	0.025	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.35		0.22	0.040	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorododecanoic acid (PFDoA)	0.29		0.22	0.075	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorotridecanoic acid (PFTriA)	0.086	J	0.22	0.057	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.058	J	0.22	0.035	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.79	B	0.56	0.22	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-29 — Lab Sample ID: 320-66250-22

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.041	J	0.23	0.036	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.53	J B	0.59	0.23	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: SS-30 — Lab Sample ID: 320-66250-23

No Detections.

Client Sample ID: SS-31 — Lab Sample ID: 320-66250-24

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.049	J	0.22	0.035	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.89	B	0.56	0.22	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: AKA-SB1-01 — Lab Sample ID: 320-66250-25

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.088	J I	0.20	0.042	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.063	J	0.20	0.029	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.16	J	0.20	0.087	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.097	J	0.20	0.036	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.22		0.20	0.022	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroundecanoic acid (PFUnA)	0.13	J	0.20	0.036	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorododecanoic acid (PFDoA)	0.17	J	0.20	0.068	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.12	J	0.20	0.031	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	5.8	B	0.50	0.20	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: AKA-SB1-02 — Lab Sample ID: 320-66250-26

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.72		0.20	0.043	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.51		0.20	0.030	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.56		0.20	0.088	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.056	J	0.20	0.037	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.36		0.20	0.032	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	20	E B	0.51	0.20	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: AKA-SB1-12 — Lab Sample ID: 320-66250-27

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	0.64		0.22	0.045	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.60		0.22	0.031	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.89		0.22	0.093	ug/Kg	1	☼	537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: AKA-SB1-12 (Continued) — Lab Sample ID: 320-66250-27

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorononanoic acid (PFNA)	0.068	J	0.22	0.039	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.44		0.22	0.033	ug/Kg	1	☼	537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	22	E B	0.54	0.22	ug/Kg	1	☼	537 (modified)	Total/NA

Client Sample ID: FB-SS-12 — Lab Sample ID: 320-66250-28

No Detections.

Client Sample ID: EB-SS-12 — Lab Sample ID: 320-66250-29

No Detections.

Client Sample ID: EB-SS-22 — Lab Sample ID: 320-66250-30

No Detections.

This Detection Summary does not include radiochemical test results.

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-08
Date Collected: 10/29/20 12:30
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-1
Matrix: Solid
Percent Solids: 83.5

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.58**		0.24	0.050	ug/Kg	☼	11/10/20 06:12	11/13/20 02:22	1
Perfluoroheptanoic acid (PFHpA)	**0.18**	**J**	0.24	0.034	ug/Kg	☼	11/10/20 06:12	11/13/20 02:22	1
Perfluorooctanoic acid (PFOA)	**1.0**		0.24	0.10	ug/Kg	☼	11/10/20 06:12	11/13/20 02:22	1
Perfluorononanoic acid (PFNA)	**0.77**		0.24	0.043	ug/Kg	☼	11/10/20 06:12	11/13/20 02:22	1
Perfluorodecanoic acid (PFDA)	**4.4**	**F1**	0.24	0.026	ug/Kg	☼	11/10/20 06:12	11/13/20 02:22	1
Perfluoroundecanoic acid (PFUnA)	**0.48**		0.24	0.043	ug/Kg	☼	11/10/20 06:12	11/13/20 02:22	1
Perfluorododecanoic acid (PFDoA)	**1.4**		0.24	0.079	ug/Kg	☼	11/10/20 06:12	11/13/20 02:22	1
Perfluorotridecanoic acid (PFTriA)	**0.36**		0.24	0.060	ug/Kg	☼	11/10/20 06:12	11/13/20 02:22	1
Perfluorotetradecanoic acid (PFTeA)	**0.84**		0.24	0.064	ug/Kg	☼	11/10/20 06:12	11/13/20 02:22	1
Perfluorobutanesulfonic acid (PFBS)	**0.083**	**J**	0.24	0.030	ug/Kg	☼	11/10/20 06:12	11/13/20 02:22	1
Perfluorohexanesulfonic acid (PFHxS)	**3.7**	**F1**	0.24	0.037	ug/Kg	☼	11/10/20 06:12	11/13/20 02:22	1
Perfluorooctanesulfonic acid (PFOS)	**5.8**	**F1**	0.59	0.24	ug/Kg	☼	11/10/20 06:12	11/13/20 02:22	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.4	0.46	ug/Kg	☼	11/10/20 06:12	11/13/20 02:22	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.4	0.44	ug/Kg	☼	11/10/20 06:12	11/13/20 02:22	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.24	0.032	ug/Kg	☼	11/10/20 06:12	11/13/20 02:22	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.30	0.13	ug/Kg	☼	11/10/20 06:12	11/13/20 02:22	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.24	0.026	ug/Kg	☼	11/10/20 06:12	11/13/20 02:22	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.24	0.021	ug/Kg	☼	11/10/20 06:12	11/13/20 02:22	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*84*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:22*	*1*
13C4 PFHpA	*90*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:22*	*1*
13C4 PFOA	*86*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:22*	*1*
13C5 PFNA	*87*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:22*	*1*
13C2 PFDA	*81*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:22*	*1*
13C2 PFUnA	*83*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:22*	*1*
13C2 PFDoA	*78*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:22*	*1*
13C2 PFTeDA	*81*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:22*	*1*
13C3 PFBS	*75*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:22*	*1*
18O2 PFHxS	*80*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:22*	*1*
13C4 PFOS	*78*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:22*	*1*
d3-NMeFOSAA	*70*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:22*	*1*
d5-NEtFOSAA	*72*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:22*	*1*
13C3 HFPO-DA	*72*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:22*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-09
Date Collected: 10/29/20 13:00
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-2
Matrix: Solid
Percent Solids: 89.9

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.30**		0.22	0.046	ug/Kg	☼	11/10/20 06:12	11/13/20 02:50	1
Perfluoroheptanoic acid (PFHpA)	**0.062**	**J**	0.22	0.031	ug/Kg	☼	11/10/20 06:12	11/13/20 02:50	1
Perfluorooctanoic acid (PFOA)	**0.28**		0.22	0.093	ug/Kg	☼	11/10/20 06:12	11/13/20 02:50	1
Perfluorononanoic acid (PFNA)	**0.061**	**J**	0.22	0.039	ug/Kg	☼	11/10/20 06:12	11/13/20 02:50	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.024	ug/Kg	☼	11/10/20 06:12	11/13/20 02:50	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.039	ug/Kg	☼	11/10/20 06:12	11/13/20 02:50	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.073	ug/Kg	☼	11/10/20 06:12	11/13/20 02:50	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.055	ug/Kg	☼	11/10/20 06:12	11/13/20 02:50	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.059	ug/Kg	☼	11/10/20 06:12	11/13/20 02:50	1
Perfluorobutanesulfonic acid (PFBS)	**0.028**	**J**	0.22	0.027	ug/Kg	☼	11/10/20 06:12	11/13/20 02:50	1
Perfluorohexanesulfonic acid (PFHxS)	**0.76**		0.22	0.034	ug/Kg	☼	11/10/20 06:12	11/13/20 02:50	1
Perfluorooctanesulfonic acid (PFOS)	**4.5**		0.54	0.22	ug/Kg	☼	11/10/20 06:12	11/13/20 02:50	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.42	ug/Kg	☼	11/10/20 06:12	11/13/20 02:50	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.40	ug/Kg	☼	11/10/20 06:12	11/13/20 02:50	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.22	0.029	ug/Kg	☼	11/10/20 06:12	11/13/20 02:50	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.27	0.12	ug/Kg	☼	11/10/20 06:12	11/13/20 02:50	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.22	0.024	ug/Kg	☼	11/10/20 06:12	11/13/20 02:50	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.22	0.020	ug/Kg	☼	11/10/20 06:12	11/13/20 02:50	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*80*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:50*	*1*
13C4 PFHpA	*86*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:50*	*1*
13C4 PFOA	*89*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:50*	*1*
13C5 PFNA	*87*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:50*	*1*
13C2 PFDA	*83*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:50*	*1*
13C2 PFUnA	*80*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:50*	*1*
13C2 PFDoA	*83*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:50*	*1*
13C2 PFTeDA	*81*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:50*	*1*
13C3 PFBS	*61*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:50*	*1*
18O2 PFHxS	*67*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:50*	*1*
13C4 PFOS	*65*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:50*	*1*
d3-NMeFOSAA	*64*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:50*	*1*
d5-NEtFOSAA	*67*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:50*	*1*
13C3 HFPO-DA	*72*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:50*	*1*

Client Sample ID: SS-10
Date Collected: 10/29/20 20:30
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-3
Matrix: Solid
Percent Solids: 93.0

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.32**		0.20	0.042	ug/Kg	☼	11/10/20 06:12	11/13/20 02:59	1
Perfluoroheptanoic acid (PFHpA)	**0.087**	**J**	0.20	0.029	ug/Kg	☼	11/10/20 06:12	11/13/20 02:59	1
Perfluorooctanoic acid (PFOA)	**0.099**	**J**	0.20	0.086	ug/Kg	☼	11/10/20 06:12	11/13/20 02:59	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.036	ug/Kg	☼	11/10/20 06:12	11/13/20 02:59	1
Perfluorodecanoic acid (PFDA)	**0.073**	**J**	0.20	0.022	ug/Kg	☼	11/10/20 06:12	11/13/20 02:59	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036	ug/Kg	☼	11/10/20 06:12	11/13/20 02:59	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.067	ug/Kg	☼	11/10/20 06:12	11/13/20 02:59	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051	ug/Kg	☼	11/10/20 06:12	11/13/20 02:59	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054	ug/Kg	☼	11/10/20 06:12	11/13/20 02:59	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg	☼	11/10/20 06:12	11/13/20 02:59	1
Perfluorohexanesulfonic acid (PFHxS)	**0.26**		0.20	0.031	ug/Kg	☼	11/10/20 06:12	11/13/20 02:59	1
Perfluorooctanesulfonic acid (PFOS)	**1.6**		0.50	0.20	ug/Kg	☼	11/10/20 06:12	11/13/20 02:59	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg	☼	11/10/20 06:12	11/13/20 02:59	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg	☼	11/10/20 06:12	11/13/20 02:59	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.027	ug/Kg	☼	11/10/20 06:12	11/13/20 02:59	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.25	0.11	ug/Kg	☼	11/10/20 06:12	11/13/20 02:59	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.022	ug/Kg	☼	11/10/20 06:12	11/13/20 02:59	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg	☼	11/10/20 06:12	11/13/20 02:59	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*81*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:59*	*1*
13C4 PFHpA	*84*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:59*	*1*
13C4 PFOA	*86*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:59*	*1*
13C5 PFNA	*81*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:59*	*1*
13C2 PFDA	*76*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:59*	*1*
13C2 PFUnA	*74*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:59*	*1*
13C2 PFDoA	*76*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:59*	*1*
13C2 PFTeDA	*74*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:59*	*1*
13C3 PFBS	*72*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:59*	*1*
18O2 PFHxS	*76*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:59*	*1*
13C4 PFOS	*74*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:59*	*1*
d3-NMeFOSAA	*70*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:59*	*1*
d5-NEtFOSAA	*71*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:59*	*1*
13C3 HFPO-DA	*71*		*25 - 150*	*11/10/20 06:12*	*11/13/20 02:59*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-11
Date Collected: 10/29/20 20:35
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-4
Matrix: Solid
Percent Solids: 90.9

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.25**		0.20	0.043	ug/Kg	☼	11/10/20 06:12	11/13/20 03:09	1
Perfluoroheptanoic acid (PFHpA)	**0.069**	**J**	0.20	0.030	ug/Kg	☼	11/10/20 06:12	11/13/20 03:09	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.088	ug/Kg	☼	11/10/20 06:12	11/13/20 03:09	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.037	ug/Kg	☼	11/10/20 06:12	11/13/20 03:09	1
Perfluorodecanoic acid (PFDA)	**0.069**	**J**	0.20	0.023	ug/Kg	☼	11/10/20 06:12	11/13/20 03:09	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.037	ug/Kg	☼	11/10/20 06:12	11/13/20 03:09	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.069	ug/Kg	☼	11/10/20 06:12	11/13/20 03:09	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.052	ug/Kg	☼	11/10/20 06:12	11/13/20 03:09	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.055	ug/Kg	☼	11/10/20 06:12	11/13/20 03:09	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.026	ug/Kg	☼	11/10/20 06:12	11/13/20 03:09	1
Perfluorohexanesulfonic acid (PFHxS)	**0.24**		0.20	0.032	ug/Kg	☼	11/10/20 06:12	11/13/20 03:09	1
Perfluorooctanesulfonic acid (PFOS)	**1.6**		0.51	0.20	ug/Kg	☼	11/10/20 06:12	11/13/20 03:09	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.40	ug/Kg	☼	11/10/20 06:12	11/13/20 03:09	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.38	ug/Kg	☼	11/10/20 06:12	11/13/20 03:09	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.028	ug/Kg	☼	11/10/20 06:12	11/13/20 03:09	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.26	0.11	ug/Kg	☼	11/10/20 06:12	11/13/20 03:09	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.023	ug/Kg	☼	11/10/20 06:12	11/13/20 03:09	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg	☼	11/10/20 06:12	11/13/20 03:09	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*86*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:09*	*1*
13C4 PFHpA	*88*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:09*	*1*
13C4 PFOA	*87*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:09*	*1*
13C5 PFNA	*82*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:09*	*1*
13C2 PFDA	*77*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:09*	*1*
13C2 PFUnA	*76*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:09*	*1*
13C2 PFDoA	*81*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:09*	*1*
13C2 PFTeDA	*71*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:09*	*1*
13C3 PFBS	*72*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:09*	*1*
18O2 PFHxS	*78*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:09*	*1*
13C4 PFOS	*74*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:09*	*1*
d3-NMeFOSAA	*70*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:09*	*1*
d5-NEtFOSAA	*77*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:09*	*1*
13C3 HFPO-DA	*73*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:09*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-12
Date Collected: 10/29/20 21:00
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-5
Matrix: Solid
Percent Solids: 92.7

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**5.6**		0.20	0.043	ug/Kg	☼	11/10/20 06:12	11/13/20 03:37	1
Perfluoroheptanoic acid (PFHpA)	**0.12**	**J**	0.20	0.030	ug/Kg	☼	11/10/20 06:12	11/13/20 03:37	1
Perfluorooctanoic acid (PFOA)	**0.13**	**J**	0.20	0.088	ug/Kg	☼	11/10/20 06:12	11/13/20 03:37	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.037	ug/Kg	☼	11/10/20 06:12	11/13/20 03:37	1
Perfluorodecanoic acid (PFDA)	**0.084**	**J**	0.20	0.023	ug/Kg	☼	11/10/20 06:12	11/13/20 03:37	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.037	ug/Kg	☼	11/10/20 06:12	11/13/20 03:37	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.069	ug/Kg	☼	11/10/20 06:12	11/13/20 03:37	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.052	ug/Kg	☼	11/10/20 06:12	11/13/20 03:37	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.055	ug/Kg	☼	11/10/20 06:12	11/13/20 03:37	1
Perfluorobutanesulfonic acid (PFBS)	**0.35**		0.20	0.026	ug/Kg	☼	11/10/20 06:12	11/13/20 03:37	1
Perfluorohexanesulfonic acid (PFHxS)	**0.58**		0.20	0.032	ug/Kg	☼	11/10/20 06:12	11/13/20 03:37	1
Perfluorooctanesulfonic acid (PFOS)	**3.7**		0.51	0.20	ug/Kg	☼	11/10/20 06:12	11/13/20 03:37	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.40	ug/Kg	☼	11/10/20 06:12	11/13/20 03:37	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.38	ug/Kg	☼	11/10/20 06:12	11/13/20 03:37	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.028	ug/Kg	☼	11/10/20 06:12	11/13/20 03:37	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.26	0.11	ug/Kg	☼	11/10/20 06:12	11/13/20 03:37	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.023	ug/Kg	☼	11/10/20 06:12	11/13/20 03:37	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg	☼	11/10/20 06:12	11/13/20 03:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*80*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:37*	*1*
13C4 PFHpA	*88*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:37*	*1*
13C4 PFOA	*86*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:37*	*1*
13C5 PFNA	*86*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:37*	*1*
13C2 PFDA	*82*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:37*	*1*
13C2 PFUnA	*77*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:37*	*1*
13C2 PFDoA	*82*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:37*	*1*
13C2 PFTeDA	*75*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:37*	*1*
13C3 PFBS	*67*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:37*	*1*
18O2 PFHxS	*72*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:37*	*1*
13C4 PFOS	*69*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:37*	*1*
d3-NMeFOSAA	*43*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:37*	*1*
d5-NEtFOSAA	*48*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:37*	*1*
13C3 HFPO-DA	*71*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:37*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-13
Date Collected: 10/29/20 15:35
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-6
Matrix: Solid
Percent Solids: 82.3

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**1.3**		0.24	0.050	ug/Kg	☼	11/10/20 06:12	11/13/20 03:46	1
Perfluoroheptanoic acid (PFHpA)	**0.41**		0.24	0.034	ug/Kg	☼	11/10/20 06:12	11/13/20 03:46	1
Perfluorooctanoic acid (PFOA)	**1.9**		0.24	0.10	ug/Kg	☼	11/10/20 06:12	11/13/20 03:46	1
Perfluorononanoic acid (PFNA)	**0.38**		0.24	0.043	ug/Kg	☼	11/10/20 06:12	11/13/20 03:46	1
Perfluorodecanoic acid (PFDA)	**0.29**		0.24	0.026	ug/Kg	☼	11/10/20 06:12	11/13/20 03:46	1
Perfluoroundecanoic acid (PFUnA)	ND		0.24	0.043	ug/Kg	☼	11/10/20 06:12	11/13/20 03:46	1
Perfluorododecanoic acid (PFDoA)	**0.087**	**J**	0.24	0.080	ug/Kg	☼	11/10/20 06:12	11/13/20 03:46	1
Perfluorotridecanoic acid (PFTriA)	ND		0.24	0.061	ug/Kg	☼	11/10/20 06:12	11/13/20 03:46	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.24	0.064	ug/Kg	☼	11/10/20 06:12	11/13/20 03:46	1
Perfluorobutanesulfonic acid (PFBS)	**0.13**	**J**	0.24	0.030	ug/Kg	☼	11/10/20 06:12	11/13/20 03:46	1
Perfluorohexanesulfonic acid (PFHxS)	**9.1**		0.24	0.037	ug/Kg	☼	11/10/20 06:12	11/13/20 03:46	1
Perfluorooctanesulfonic acid (PFOS)	**180**	**E**	0.59	0.24	ug/Kg	☼	11/10/20 06:12	11/13/20 03:46	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.4	0.46	ug/Kg	☼	11/10/20 06:12	11/13/20 03:46	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.4	0.44	ug/Kg	☼	11/10/20 06:12	11/13/20 03:46	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.24	0.032	ug/Kg	☼	11/10/20 06:12	11/13/20 03:46	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.30	0.13	ug/Kg	☼	11/10/20 06:12	11/13/20 03:46	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.24	0.026	ug/Kg	☼	11/10/20 06:12	11/13/20 03:46	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.24	0.021	ug/Kg	☼	11/10/20 06:12	11/13/20 03:46	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*90*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:46*	*1*
13C4 PFHpA	*94*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:46*	*1*
13C4 PFOA	*92*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:46*	*1*
13C5 PFNA	*74*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:46*	*1*
13C2 PFDA	*90*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:46*	*1*
13C2 PFUnA	*87*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:46*	*1*
13C2 PFDoA	*91*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:46*	*1*
13C2 PFTeDA	*87*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:46*	*1*
13C3 PFBS	*79*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:46*	*1*
18O2 PFHxS	*87*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:46*	*1*
13C4 PFOS	*74*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:46*	*1*
d3-NMeFOSAA	*78*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:46*	*1*
d5-NEtFOSAA	*80*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:46*	*1*
13C3 HFPO-DA	*76*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:46*	*1*

Client Sample ID: SS-14
Date Collected: 10/29/20 16:05
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-7
Matrix: Solid
Percent Solids: 88.7

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.72**		0.22	0.046	ug/Kg	☼	11/10/20 06:12	11/13/20 03:55	1
Perfluoroheptanoic acid (PFHpA)	**0.15**	**J**	0.22	0.032	ug/Kg	☼	11/10/20 06:12	11/13/20 03:55	1
Perfluorooctanoic acid (PFOA)	**0.63**		0.22	0.094	ug/Kg	☼	11/10/20 06:12	11/13/20 03:55	1
Perfluorononanoic acid (PFNA)	**0.11**	**J**	0.22	0.039	ug/Kg	☼	11/10/20 06:12	11/13/20 03:55	1
Perfluorodecanoic acid (PFDA)	**0.20**	**J**	0.22	0.024	ug/Kg	☼	11/10/20 06:12	11/13/20 03:55	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.039	ug/Kg	☼	11/10/20 06:12	11/13/20 03:55	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.073	ug/Kg	☼	11/10/20 06:12	11/13/20 03:55	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.055	ug/Kg	☼	11/10/20 06:12	11/13/20 03:55	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.059	ug/Kg	☼	11/10/20 06:12	11/13/20 03:55	1
Perfluorobutanesulfonic acid (PFBS)	**0.15**	**J**	0.22	0.027	ug/Kg	☼	11/10/20 06:12	11/13/20 03:55	1
Perfluorohexanesulfonic acid (PFHxS)	**3.9**		0.22	0.034	ug/Kg	☼	11/10/20 06:12	11/13/20 03:55	1
Perfluorooctanesulfonic acid (PFOS)	**13**		0.54	0.22	ug/Kg	☼	11/10/20 06:12	11/13/20 03:55	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.42	ug/Kg	☼	11/10/20 06:12	11/13/20 03:55	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.40	ug/Kg	☼	11/10/20 06:12	11/13/20 03:55	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.22	0.029	ug/Kg	☼	11/10/20 06:12	11/13/20 03:55	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.27	0.12	ug/Kg	☼	11/10/20 06:12	11/13/20 03:55	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.22	0.024	ug/Kg	☼	11/10/20 06:12	11/13/20 03:55	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.22	0.020	ug/Kg	☼	11/10/20 06:12	11/13/20 03:55	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*83*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:55*	*1*
13C4 PFHpA	*91*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:55*	*1*
13C4 PFOA	*90*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:55*	*1*
13C5 PFNA	*86*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:55*	*1*
13C2 PFDA	*82*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:55*	*1*
13C2 PFUnA	*83*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:55*	*1*
13C2 PFDoA	*84*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:55*	*1*
13C2 PFTeDA	*84*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:55*	*1*
13C3 PFBS	*74*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:55*	*1*
18O2 PFHxS	*81*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:55*	*1*
13C4 PFOS	*78*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:55*	*1*
d3-NMeFOSAA	*30*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:55*	*1*
d5-NEtFOSAA	*31*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:55*	*1*
13C3 HFPO-DA	*73*		*25 - 150*	*11/10/20 06:12*	*11/13/20 03:55*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-15
Date Collected: 10/29/20 16:25
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-8
Matrix: Solid
Percent Solids: 85.8

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.22	0.047	ug/Kg	☼	11/10/20 06:12	11/13/20 04:05	1
Perfluoroheptanoic acid (PFHpA)	ND		0.22	0.033	ug/Kg	☼	11/10/20 06:12	11/13/20 04:05	1
Perfluorooctanoic acid (PFOA)	**0.099**	**J**	0.22	0.096	ug/Kg	☼	11/10/20 06:12	11/13/20 04:05	1
Perfluorononanoic acid (PFNA)	**0.099**	**J**	0.22	0.040	ug/Kg	☼	11/10/20 06:12	11/13/20 04:05	1
Perfluorodecanoic acid (PFDA)	**0.13**	**J**	0.22	0.025	ug/Kg	☼	11/10/20 06:12	11/13/20 04:05	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.040	ug/Kg	☼	11/10/20 06:12	11/13/20 04:05	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.075	ug/Kg	☼	11/10/20 06:12	11/13/20 04:05	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.057	ug/Kg	☼	11/10/20 06:12	11/13/20 04:05	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.061	ug/Kg	☼	11/10/20 06:12	11/13/20 04:05	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.028	ug/Kg	☼	11/10/20 06:12	11/13/20 04:05	1
Perfluorohexanesulfonic acid (PFHxS)	**0.14**	**J**	0.22	0.035	ug/Kg	☼	11/10/20 06:12	11/13/20 04:05	1
Perfluorooctanesulfonic acid (PFOS)	**2.4**		0.56	0.22	ug/Kg	☼	11/10/20 06:12	11/13/20 04:05	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.44	ug/Kg	☼	11/10/20 06:12	11/13/20 04:05	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.41	ug/Kg	☼	11/10/20 06:12	11/13/20 04:05	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.22	0.030	ug/Kg	☼	11/10/20 06:12	11/13/20 04:05	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.28	0.12	ug/Kg	☼	11/10/20 06:12	11/13/20 04:05	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.22	0.025	ug/Kg	☼	11/10/20 06:12	11/13/20 04:05	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.22	0.020	ug/Kg	☼	11/10/20 06:12	11/13/20 04:05	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*79*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:05*	*1*
13C4 PFHpA	*88*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:05*	*1*
13C4 PFOA	*88*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:05*	*1*
13C5 PFNA	*86*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:05*	*1*
13C2 PFDA	*84*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:05*	*1*
13C2 PFUnA	*86*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:05*	*1*
13C2 PFDoA	*87*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:05*	*1*
13C2 PFTeDA	*86*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:05*	*1*
13C3 PFBS	*72*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:05*	*1*
18O2 PFHxS	*80*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:05*	*1*
13C4 PFOS	*77*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:05*	*1*
d3-NMeFOSAA	*50*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:05*	*1*
d5-NEtFOSAA	*54*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:05*	*1*
13C3 HFPO-DA	*67*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:05*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-16

Date Collected: 10/29/20 16:50
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-9

Matrix: Solid
Percent Solids: 87.7

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.053**	**J**	0.21	0.045	ug/Kg	☼	11/10/20 06:12	11/13/20 04:14	1
Perfluoroheptanoic acid (PFHpA)	**0.037**	**J**	0.21	0.031	ug/Kg	☼	11/10/20 06:12	11/13/20 04:14	1
Perfluorooctanoic acid (PFOA)	ND		0.21	0.092	ug/Kg	☼	11/10/20 06:12	11/13/20 04:14	1
Perfluorononanoic acid (PFNA)	**0.044**	**J**	0.21	0.038	ug/Kg	☼	11/10/20 06:12	11/13/20 04:14	1
Perfluorodecanoic acid (PFDA)	**0.078**	**J**	0.21	0.023	ug/Kg	☼	11/10/20 06:12	11/13/20 04:14	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	11/10/20 06:12	11/13/20 04:14	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.071	ug/Kg	☼	11/10/20 06:12	11/13/20 04:14	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	11/10/20 06:12	11/13/20 04:14	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.058	ug/Kg	☼	11/10/20 06:12	11/13/20 04:14	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.027	ug/Kg	☼	11/10/20 06:12	11/13/20 04:14	1
Perfluorohexanesulfonic acid (PFHxS)	**0.044**	**J**	0.21	0.033	ug/Kg	☼	11/10/20 06:12	11/13/20 04:14	1
Perfluorooctanesulfonic acid (PFOS)	**0.48**	**J**	0.53	0.21	ug/Kg	☼	11/10/20 06:12	11/13/20 04:14	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.42	ug/Kg	☼	11/10/20 06:12	11/13/20 04:14	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	11/10/20 06:12	11/13/20 04:14	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.21	0.029	ug/Kg	☼	11/10/20 06:12	11/13/20 04:14	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.27	0.12	ug/Kg	☼	11/10/20 06:12	11/13/20 04:14	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.21	0.023	ug/Kg	☼	11/10/20 06:12	11/13/20 04:14	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.21	0.019	ug/Kg	☼	11/10/20 06:12	11/13/20 04:14	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*76*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:14*	*1*
13C4 PFHpA	*86*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:14*	*1*
13C4 PFOA	*90*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:14*	*1*
13C5 PFNA	*87*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:14*	*1*
13C2 PFDA	*84*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:14*	*1*
13C2 PFUnA	*82*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:14*	*1*
13C2 PFDoA	*85*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:14*	*1*
13C2 PFTeDA	*82*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:14*	*1*
13C3 PFBS	*71*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:14*	*1*
18O2 PFHxS	*75*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:14*	*1*
13C4 PFOS	*75*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:14*	*1*
d3-NMeFOSAA	*78*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:14*	*1*
d5-NEtFOSAA	*87*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:14*	*1*
13C3 HFPO-DA	*67*		*25 - 150*	*11/10/20 06:12*	*11/13/20 04:14*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-17
Date Collected: 10/29/20 19:55
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-10
Matrix: Solid
Percent Solids: 90.1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.21	0.043	ug/Kg	☼	11/10/20 06:18	11/12/20 19:03	1
Perfluoroheptanoic acid (PFHpA)	ND		0.21	0.030	ug/Kg	☼	11/10/20 06:18	11/12/20 19:03	1
Perfluorooctanoic acid (PFOA)	ND		0.21	0.089	ug/Kg	☼	11/10/20 06:18	11/12/20 19:03	1
Perfluorononanoic acid (PFNA)	**0.041**	**J**	0.21	0.037	ug/Kg	☼	11/10/20 06:18	11/12/20 19:03	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.023	ug/Kg	☼	11/10/20 06:18	11/12/20 19:03	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.037	ug/Kg	☼	11/10/20 06:18	11/12/20 19:03	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.069	ug/Kg	☼	11/10/20 06:18	11/12/20 19:03	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.053	ug/Kg	☼	11/10/20 06:18	11/12/20 19:03	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.056	ug/Kg	☼	11/10/20 06:18	11/12/20 19:03	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	11/10/20 06:18	11/12/20 19:03	1
Perfluorohexanesulfonic acid (PFHxS)	**0.084**	**J**	0.21	0.032	ug/Kg	☼	11/10/20 06:18	11/12/20 19:03	1
Perfluorooctanesulfonic acid (PFOS)	**1.5**		0.52	0.21	ug/Kg	☼	11/10/20 06:18	11/12/20 19:03	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.40	ug/Kg	☼	11/10/20 06:18	11/12/20 19:03	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.38	ug/Kg	☼	11/10/20 06:18	11/12/20 19:03	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.21	0.028	ug/Kg	☼	11/10/20 06:18	11/12/20 19:03	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.26	0.11	ug/Kg	☼	11/10/20 06:18	11/12/20 19:03	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.21	0.023	ug/Kg	☼	11/10/20 06:18	11/12/20 19:03	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.21	0.019	ug/Kg	☼	11/10/20 06:18	11/12/20 19:03	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*89*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:03*	*1*
13C4 PFHpA	*95*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:03*	*1*
13C4 PFOA	*89*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:03*	*1*
13C5 PFNA	*81*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:03*	*1*
13C2 PFDA	*85*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:03*	*1*
13C2 PFUnA	*87*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:03*	*1*
13C2 PFDoA	*74*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:03*	*1*
13C2 PFTeDA	*72*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:03*	*1*
13C3 PFBS	*79*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:03*	*1*
18O2 PFHxS	*80*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:03*	*1*
13C4 PFOS	*81*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:03*	*1*
d3-NMeFOSAA	*87*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:03*	*1*
d5-NEtFOSAA	*81*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:03*	*1*
13C3 HFPO-DA	*85*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:03*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-18
Date Collected: 10/30/20 14:35
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-11
Matrix: Solid
Percent Solids: 90.2

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.043	ug/Kg	☼	11/10/20 06:18	11/12/20 19:32	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.030	ug/Kg	☼	11/10/20 06:18	11/12/20 19:32	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.088	ug/Kg	☼	11/10/20 06:18	11/12/20 19:32	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.037	ug/Kg	☼	11/10/20 06:18	11/12/20 19:32	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg	☼	11/10/20 06:18	11/12/20 19:32	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.037	ug/Kg	☼	11/10/20 06:18	11/12/20 19:32	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.068	ug/Kg	☼	11/10/20 06:18	11/12/20 19:32	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.052	ug/Kg	☼	11/10/20 06:18	11/12/20 19:32	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.055	ug/Kg	☼	11/10/20 06:18	11/12/20 19:32	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg	☼	11/10/20 06:18	11/12/20 19:32	1
Perfluorohexanesulfonic acid (PFHxS)	**0.12**	**J**	0.20	0.032	ug/Kg	☼	11/10/20 06:18	11/12/20 19:32	1
Perfluorooctanesulfonic acid (PFOS)	**1.6**		0.51	0.20	ug/Kg	☼	11/10/20 06:18	11/12/20 19:32	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.40	ug/Kg	☼	11/10/20 06:18	11/12/20 19:32	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.38	ug/Kg	☼	11/10/20 06:18	11/12/20 19:32	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.028	ug/Kg	☼	11/10/20 06:18	11/12/20 19:32	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.25	0.11	ug/Kg	☼	11/10/20 06:18	11/12/20 19:32	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.022	ug/Kg	☼	11/10/20 06:18	11/12/20 19:32	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg	☼	11/10/20 06:18	11/12/20 19:32	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*87*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:32*	*1*
13C4 PFHpA	*88*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:32*	*1*
13C4 PFOA	*90*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:32*	*1*
13C5 PFNA	*79*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:32*	*1*
13C2 PFDA	*78*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:32*	*1*
13C2 PFUnA	*84*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:32*	*1*
13C2 PFDoA	*77*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:32*	*1*
13C2 PFTeDA	*74*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:32*	*1*
13C3 PFBS	*76*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:32*	*1*
18O2 PFHxS	*81*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:32*	*1*
13C4 PFOS	*77*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:32*	*1*
d3-NMeFOSAA	*91*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:32*	*1*
d5-NEtFOSAA	*90*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:32*	*1*
13C3 HFPO-DA	*85*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:32*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-19
Date Collected: 10/30/20 15:55
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-12
Matrix: Solid
Percent Solids: 90.0

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.21	0.045	ug/Kg	☼	11/10/20 06:18	11/12/20 19:41	1
Perfluoroheptanoic acid (PFHpA)	ND		0.21	0.031	ug/Kg	☼	11/10/20 06:18	11/12/20 19:41	1
Perfluorooctanoic acid (PFOA)	ND		0.21	0.092	ug/Kg	☼	11/10/20 06:18	11/12/20 19:41	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.038	ug/Kg	☼	11/10/20 06:18	11/12/20 19:41	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.024	ug/Kg	☼	11/10/20 06:18	11/12/20 19:41	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	11/10/20 06:18	11/12/20 19:41	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.072	ug/Kg	☼	11/10/20 06:18	11/12/20 19:41	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	11/10/20 06:18	11/12/20 19:41	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.058	ug/Kg	☼	11/10/20 06:18	11/12/20 19:41	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.027	ug/Kg	☼	11/10/20 06:18	11/12/20 19:41	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.21	0.033	ug/Kg	☼	11/10/20 06:18	11/12/20 19:41	1
Perfluorooctanesulfonic acid (PFOS)	**0.31**	**J**	0.53	0.21	ug/Kg	☼	11/10/20 06:18	11/12/20 19:41	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.42	ug/Kg	☼	11/10/20 06:18	11/12/20 19:41	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.40	ug/Kg	☼	11/10/20 06:18	11/12/20 19:41	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.21	0.029	ug/Kg	☼	11/10/20 06:18	11/12/20 19:41	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.27	0.12	ug/Kg	☼	11/10/20 06:18	11/12/20 19:41	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.21	0.024	ug/Kg	☼	11/10/20 06:18	11/12/20 19:41	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.21	0.019	ug/Kg	☼	11/10/20 06:18	11/12/20 19:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*86*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:41*	*1*
13C4 PFHpA	*90*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:41*	*1*
13C4 PFOA	*85*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:41*	*1*
13C5 PFNA	*84*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:41*	*1*
13C2 PFDA	*82*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:41*	*1*
13C2 PFUnA	*82*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:41*	*1*
13C2 PFDoA	*75*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:41*	*1*
13C2 PFTeDA	*74*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:41*	*1*
13C3 PFBS	*76*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:41*	*1*
18O2 PFHxS	*77*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:41*	*1*
13C4 PFOS	*77*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:41*	*1*
d3-NMeFOSAA	*84*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:41*	*1*
d5-NEtFOSAA	*80*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:41*	*1*
13C3 HFPO-DA	*83*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:41*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-20
Date Collected: 10/30/20 16:05
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-13
Matrix: Solid
Percent Solids: 86.5

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.21	0.044	ug/Kg	☼	11/10/20 06:18	11/12/20 19:50	1
Perfluoroheptanoic acid (PFHpA)	ND		0.21	0.030	ug/Kg	☼	11/10/20 06:18	11/12/20 19:50	1
Perfluorooctanoic acid (PFOA)	ND		0.21	0.090	ug/Kg	☼	11/10/20 06:18	11/12/20 19:50	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.038	ug/Kg	☼	11/10/20 06:18	11/12/20 19:50	1
Perfluorodecanoic acid (PFDA)	**0.034**	**J**	0.21	0.023	ug/Kg	☼	11/10/20 06:18	11/12/20 19:50	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	11/10/20 06:18	11/12/20 19:50	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.070	ug/Kg	☼	11/10/20 06:18	11/12/20 19:50	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	11/10/20 06:18	11/12/20 19:50	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.057	ug/Kg	☼	11/10/20 06:18	11/12/20 19:50	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	11/10/20 06:18	11/12/20 19:50	1
Perfluorohexanesulfonic acid (PFHxS)	**0.051**	**J I**	0.21	0.033	ug/Kg	☼	11/10/20 06:18	11/12/20 19:50	1
Perfluorooctanesulfonic acid (PFOS)	**0.38**	**J**	0.53	0.21	ug/Kg	☼	11/10/20 06:18	11/12/20 19:50	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	11/10/20 06:18	11/12/20 19:50	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	11/10/20 06:18	11/12/20 19:50	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.21	0.028	ug/Kg	☼	11/10/20 06:18	11/12/20 19:50	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.26	0.12	ug/Kg	☼	11/10/20 06:18	11/12/20 19:50	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.21	0.023	ug/Kg	☼	11/10/20 06:18	11/12/20 19:50	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.21	0.019	ug/Kg	☼	11/10/20 06:18	11/12/20 19:50	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*89*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:50*	*1*
13C4 PFHpA	*90*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:50*	*1*
13C4 PFOA	*90*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:50*	*1*
13C5 PFNA	*83*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:50*	*1*
13C2 PFDA	*91*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:50*	*1*
13C2 PFUnA	*81*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:50*	*1*
13C2 PFDoA	*86*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:50*	*1*
13C2 PFTeDA	*83*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:50*	*1*
13C3 PFBS	*79*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:50*	*1*
18O2 PFHxS	*81*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:50*	*1*
13C4 PFOS	*81*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:50*	*1*
d3-NMeFOSAA	*94*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:50*	*1*
d5-NEtFOSAA	*104*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:50*	*1*
13C3 HFPO-DA	*81*		*25 - 150*	*11/10/20 06:18*	*11/12/20 19:50*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-21
Date Collected: 10/30/20 16:20
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-14
Matrix: Solid
Percent Solids: 88.4

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.21	0.044	ug/Kg	☼	11/10/20 06:18	11/12/20 20:19	1
Perfluoroheptanoic acid (PFHpA)	ND		0.21	0.030	ug/Kg	☼	11/10/20 06:18	11/12/20 20:19	1
Perfluorooctanoic acid (PFOA)	ND		0.21	0.090	ug/Kg	☼	11/10/20 06:18	11/12/20 20:19	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.038	ug/Kg	☼	11/10/20 06:18	11/12/20 20:19	1
Perfluorodecanoic acid (PFDA)	**0.025**	**J**	0.21	0.023	ug/Kg	☼	11/10/20 06:18	11/12/20 20:19	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	11/10/20 06:18	11/12/20 20:19	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.070	ug/Kg	☼	11/10/20 06:18	11/12/20 20:19	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	11/10/20 06:18	11/12/20 20:19	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.057	ug/Kg	☼	11/10/20 06:18	11/12/20 20:19	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	11/10/20 06:18	11/12/20 20:19	1
Perfluorohexanesulfonic acid (PFHxS)	**0.040**	**J**	0.21	0.033	ug/Kg	☼	11/10/20 06:18	11/12/20 20:19	1
Perfluorooctanesulfonic acid (PFOS)	**0.82**		0.53	0.21	ug/Kg	☼	11/10/20 06:18	11/12/20 20:19	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	11/10/20 06:18	11/12/20 20:19	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	11/10/20 06:18	11/12/20 20:19	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.21	0.028	ug/Kg	☼	11/10/20 06:18	11/12/20 20:19	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.26	0.12	ug/Kg	☼	11/10/20 06:18	11/12/20 20:19	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.21	0.023	ug/Kg	☼	11/10/20 06:18	11/12/20 20:19	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.21	0.019	ug/Kg	☼	11/10/20 06:18	11/12/20 20:19	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*86*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:19*	*1*
13C4 PFHpA	*85*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:19*	*1*
13C4 PFOA	*91*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:19*	*1*
13C5 PFNA	*82*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:19*	*1*
13C2 PFDA	*79*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:19*	*1*
13C2 PFUnA	*84*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:19*	*1*
13C2 PFDoA	*73*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:19*	*1*
13C2 PFTeDA	*78*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:19*	*1*
13C3 PFBS	*76*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:19*	*1*
18O2 PFHxS	*76*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:19*	*1*
13C4 PFOS	*75*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:19*	*1*
d3-NMeFOSAA	*50*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:19*	*1*
d5-NEtFOSAA	*44*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:19*	*1*
13C3 HFPO-DA	*79*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:19*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-22
Date Collected: 10/30/20 21:45
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-15
Matrix: Solid
Percent Solids: 92.4

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.21	0.044	ug/Kg	☼	11/10/20 06:18	11/12/20 20:28	1
Perfluoroheptanoic acid (PFHpA)	ND		0.21	0.030	ug/Kg	☼	11/10/20 06:18	11/12/20 20:28	1
Perfluorooctanoic acid (PFOA)	ND		0.21	0.090	ug/Kg	☼	11/10/20 06:18	11/12/20 20:28	1
Perfluorononanoic acid (PFNA)	ND		0.21	0.038	ug/Kg	☼	11/10/20 06:18	11/12/20 20:28	1
Perfluorodecanoic acid (PFDA)	ND		0.21	0.023	ug/Kg	☼	11/10/20 06:18	11/12/20 20:28	1
Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038	ug/Kg	☼	11/10/20 06:18	11/12/20 20:28	1
Perfluorododecanoic acid (PFDoA)	ND		0.21	0.070	ug/Kg	☼	11/10/20 06:18	11/12/20 20:28	1
Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054	ug/Kg	☼	11/10/20 06:18	11/12/20 20:28	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.057	ug/Kg	☼	11/10/20 06:18	11/12/20 20:28	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.21	0.026	ug/Kg	☼	11/10/20 06:18	11/12/20 20:28	1
Perfluorohexanesulfonic acid (PFHxS)	**0.035**	**J**	0.21	0.033	ug/Kg	☼	11/10/20 06:18	11/12/20 20:28	1
Perfluorooctanesulfonic acid (PFOS)	**0.43**	**J**	0.53	0.21	ug/Kg	☼	11/10/20 06:18	11/12/20 20:28	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.1	0.41	ug/Kg	☼	11/10/20 06:18	11/12/20 20:28	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.1	0.39	ug/Kg	☼	11/10/20 06:18	11/12/20 20:28	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.21	0.028	ug/Kg	☼	11/10/20 06:18	11/12/20 20:28	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.26	0.12	ug/Kg	☼	11/10/20 06:18	11/12/20 20:28	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.21	0.023	ug/Kg	☼	11/10/20 06:18	11/12/20 20:28	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.21	0.019	ug/Kg	☼	11/10/20 06:18	11/12/20 20:28	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*88*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:28*	*1*
13C4 PFHpA	*91*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:28*	*1*
13C4 PFOA	*89*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:28*	*1*
13C5 PFNA	*85*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:28*	*1*
13C2 PFDA	*85*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:28*	*1*
13C2 PFUnA	*89*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:28*	*1*
13C2 PFDoA	*78*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:28*	*1*
13C2 PFTeDA	*77*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:28*	*1*
13C3 PFBS	*86*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:28*	*1*
18O2 PFHxS	*84*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:28*	*1*
13C4 PFOS	*80*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:28*	*1*
d3-NMeFOSAA	*80*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:28*	*1*
d5-NEtFOSAA	*75*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:28*	*1*
13C3 HFPO-DA	*83*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:28*	*1*

Client Sample ID: SS-23
Date Collected: 10/30/20 21:35
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-16
Matrix: Solid
Percent Solids: 68.2

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.28	0.058	ug/Kg	☼	11/10/20 06:18	11/12/20 20:37	1
Perfluoroheptanoic acid (PFHpA)	ND		0.28	0.040	ug/Kg	☼	11/10/20 06:18	11/12/20 20:37	1
Perfluorooctanoic acid (PFOA)	ND		0.28	0.12	ug/Kg	☼	11/10/20 06:18	11/12/20 20:37	1
Perfluorononanoic acid (PFNA)	ND		0.28	0.050	ug/Kg	☼	11/10/20 06:18	11/12/20 20:37	1
Perfluorodecanoic acid (PFDA)	**0.036**	**J I**	0.28	0.030	ug/Kg	☼	11/10/20 06:18	11/12/20 20:37	1
Perfluoroundecanoic acid (PFUnA)	ND		0.28	0.050	ug/Kg	☼	11/10/20 06:18	11/12/20 20:37	1
Perfluorododecanoic acid (PFDoA)	ND		0.28	0.092	ug/Kg	☼	11/10/20 06:18	11/12/20 20:37	1
Perfluorotridecanoic acid (PFTriA)	ND		0.28	0.070	ug/Kg	☼	11/10/20 06:18	11/12/20 20:37	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.28	0.074	ug/Kg	☼	11/10/20 06:18	11/12/20 20:37	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.28	0.034	ug/Kg	☼	11/10/20 06:18	11/12/20 20:37	1
Perfluorohexanesulfonic acid (PFHxS)	**0.068**	**J**	0.28	0.043	ug/Kg	☼	11/10/20 06:18	11/12/20 20:37	1
Perfluorooctanesulfonic acid (PFOS)	**1.2**		0.69	0.28	ug/Kg	☼	11/10/20 06:18	11/12/20 20:37	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.8	0.54	ug/Kg	☼	11/10/20 06:18	11/12/20 20:37	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.8	0.51	ug/Kg	☼	11/10/20 06:18	11/12/20 20:37	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.28	0.037	ug/Kg	☼	11/10/20 06:18	11/12/20 20:37	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.34	0.15	ug/Kg	☼	11/10/20 06:18	11/12/20 20:37	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.28	0.030	ug/Kg	☼	11/10/20 06:18	11/12/20 20:37	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.28	0.025	ug/Kg	☼	11/10/20 06:18	11/12/20 20:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*84*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:37*	*1*
13C4 PFHpA	*89*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:37*	*1*
13C4 PFOA	*90*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:37*	*1*
13C5 PFNA	*86*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:37*	*1*
13C2 PFDA	*85*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:37*	*1*
13C2 PFUnA	*80*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:37*	*1*
13C2 PFDoA	*88*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:37*	*1*
13C2 PFTeDA	*64*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:37*	*1*
13C3 PFBS	*80*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:37*	*1*
18O2 PFHxS	*89*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:37*	*1*
13C4 PFOS	*81*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:37*	*1*
d3-NMeFOSAA	*56*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:37*	*1*
d5-NEtFOSAA	*60*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:37*	*1*
13C3 HFPO-DA	*79*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:37*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-24
Date Collected: 10/30/20 17:10
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-17
Matrix: Solid
Percent Solids: 75.8

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.25	0.053	ug/Kg	☼	11/10/20 06:18	11/12/20 20:47	1
Perfluoroheptanoic acid (PFHpA)	ND		0.25	0.037	ug/Kg	☼	11/10/20 06:18	11/12/20 20:47	1
Perfluorooctanoic acid (PFOA)	ND		0.25	0.11	ug/Kg	☼	11/10/20 06:18	11/12/20 20:47	1
Perfluorononanoic acid (PFNA)	**0.053**	**J**	0.25	0.045	ug/Kg	☼	11/10/20 06:18	11/12/20 20:47	1
Perfluorodecanoic acid (PFDA)	ND		0.25	0.028	ug/Kg	☼	11/10/20 06:18	11/12/20 20:47	1
Perfluoroundecanoic acid (PFUnA)	ND		0.25	0.045	ug/Kg	☼	11/10/20 06:18	11/12/20 20:47	1
Perfluorododecanoic acid (PFDoA)	ND		0.25	0.085	ug/Kg	☼	11/10/20 06:18	11/12/20 20:47	1
Perfluorotridecanoic acid (PFTriA)	ND		0.25	0.064	ug/Kg	☼	11/10/20 06:18	11/12/20 20:47	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.25	0.068	ug/Kg	☼	11/10/20 06:18	11/12/20 20:47	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.25	0.032	ug/Kg	☼	11/10/20 06:18	11/12/20 20:47	1
Perfluorohexanesulfonic acid (PFHxS)	**0.086**	**J**	0.25	0.039	ug/Kg	☼	11/10/20 06:18	11/12/20 20:47	1
Perfluorooctanesulfonic acid (PFOS)	**1.3**		0.63	0.25	ug/Kg	☼	11/10/20 06:18	11/12/20 20:47	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.5	0.49	ug/Kg	☼	11/10/20 06:18	11/12/20 20:47	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.5	0.47	ug/Kg	☼	11/10/20 06:18	11/12/20 20:47	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.25	0.034	ug/Kg	☼	11/10/20 06:18	11/12/20 20:47	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.32	0.14	ug/Kg	☼	11/10/20 06:18	11/12/20 20:47	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.25	0.028	ug/Kg	☼	11/10/20 06:18	11/12/20 20:47	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.25	0.023	ug/Kg	☼	11/10/20 06:18	11/12/20 20:47	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*82*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:47*	*1*
13C4 PFHpA	*87*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:47*	*1*
13C4 PFOA	*83*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:47*	*1*
13C5 PFNA	*80*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:47*	*1*
13C2 PFDA	*87*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:47*	*1*
13C2 PFUnA	*84*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:47*	*1*
13C2 PFDoA	*83*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:47*	*1*
13C2 PFTeDA	*72*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:47*	*1*
13C3 PFBS	*74*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:47*	*1*
18O2 PFHxS	*84*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:47*	*1*
13C4 PFOS	*82*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:47*	*1*
d3-NMeFOSAA	*77*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:47*	*1*
d5-NEtFOSAA	*79*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:47*	*1*
13C3 HFPO-DA	*79*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:47*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-25
Date Collected: 10/30/20 17:25
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-18
Matrix: Solid
Percent Solids: 83.7

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.24	0.050	ug/Kg	☼	11/10/20 06:18	11/12/20 20:56	1
Perfluoroheptanoic acid (PFHpA)	ND		0.24	0.034	ug/Kg	☼	11/10/20 06:18	11/12/20 20:56	1
Perfluorooctanoic acid (PFOA)	ND		0.24	0.10	ug/Kg	☼	11/10/20 06:18	11/12/20 20:56	1
Perfluorononanoic acid (PFNA)	ND		0.24	0.043	ug/Kg	☼	11/10/20 06:18	11/12/20 20:56	1
Perfluorodecanoic acid (PFDA)	ND		0.24	0.026	ug/Kg	☼	11/10/20 06:18	11/12/20 20:56	1
Perfluoroundecanoic acid (PFUnA)	ND		0.24	0.043	ug/Kg	☼	11/10/20 06:18	11/12/20 20:56	1
Perfluorododecanoic acid (PFDoA)	ND		0.24	0.079	ug/Kg	☼	11/10/20 06:18	11/12/20 20:56	1
Perfluorotridecanoic acid (PFTriA)	ND		0.24	0.060	ug/Kg	☼	11/10/20 06:18	11/12/20 20:56	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.24	0.064	ug/Kg	☼	11/10/20 06:18	11/12/20 20:56	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.24	0.030	ug/Kg	☼	11/10/20 06:18	11/12/20 20:56	1
Perfluorohexanesulfonic acid (PFHxS)	**0.037**	**J**	0.24	0.037	ug/Kg	☼	11/10/20 06:18	11/12/20 20:56	1
Perfluorooctanesulfonic acid (PFOS)	**0.41**	**J**	0.59	0.24	ug/Kg	☼	11/10/20 06:18	11/12/20 20:56	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.4	0.46	ug/Kg	☼	11/10/20 06:18	11/12/20 20:56	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.4	0.44	ug/Kg	☼	11/10/20 06:18	11/12/20 20:56	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.24	0.032	ug/Kg	☼	11/10/20 06:18	11/12/20 20:56	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.30	0.13	ug/Kg	☼	11/10/20 06:18	11/12/20 20:56	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.24	0.026	ug/Kg	☼	11/10/20 06:18	11/12/20 20:56	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.24	0.021	ug/Kg	☼	11/10/20 06:18	11/12/20 20:56	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*86*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:56*	*1*
13C4 PFHpA	*89*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:56*	*1*
13C4 PFOA	*85*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:56*	*1*
13C5 PFNA	*81*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:56*	*1*
13C2 PFDA	*83*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:56*	*1*
13C2 PFUnA	*74*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:56*	*1*
13C2 PFDoA	*76*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:56*	*1*
13C2 PFTeDA	*59*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:56*	*1*
13C3 PFBS	*76*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:56*	*1*
18O2 PFHxS	*76*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:56*	*1*
13C4 PFOS	*73*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:56*	*1*
d3-NMeFOSAA	*70*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:56*	*1*
d5-NEtFOSAA	*70*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:56*	*1*
13C3 HFPO-DA	*79*		*25 - 150*	*11/10/20 06:18*	*11/12/20 20:56*	*1*

Client Sample ID: SS-26
Date Collected: 10/30/20 17:55
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-19
Matrix: Solid
Percent Solids: 84.6

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.22	0.046	ug/Kg	☼	11/10/20 06:19	11/12/20 23:15	1
Perfluoroheptanoic acid (PFHpA)	ND		0.22	0.032	ug/Kg	☼	11/10/20 06:19	11/12/20 23:15	1
Perfluorooctanoic acid (PFOA)	ND		0.22	0.095	ug/Kg	☼	11/10/20 06:19	11/12/20 23:15	1
Perfluorononanoic acid (PFNA)	ND		0.22	0.040	ug/Kg	☼	11/10/20 06:19	11/12/20 23:15	1
Perfluorodecanoic acid (PFDA)	**0.066**	**J**	0.22	0.024	ug/Kg	☼	11/10/20 06:19	11/12/20 23:15	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.040	ug/Kg	☼	11/10/20 06:19	11/12/20 23:15	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.074	ug/Kg	☼	11/10/20 06:19	11/12/20 23:15	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.056	ug/Kg	☼	11/10/20 06:19	11/12/20 23:15	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.059	ug/Kg	☼	11/10/20 06:19	11/12/20 23:15	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.027	ug/Kg	☼	11/10/20 06:19	11/12/20 23:15	1
Perfluorohexanesulfonic acid (PFHxS)	**0.037**	**J**	0.22	0.034	ug/Kg	☼	11/10/20 06:19	11/12/20 23:15	1
Perfluorooctanesulfonic acid (PFOS)	**0.72**	**B**	0.55	0.22	ug/Kg	☼	11/10/20 06:19	11/12/20 23:15	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.43	ug/Kg	☼	11/10/20 06:19	11/12/20 23:15	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.41	ug/Kg	☼	11/10/20 06:19	11/12/20 23:15	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.22	0.030	ug/Kg	☼	11/10/20 06:19	11/12/20 23:15	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.27	0.12	ug/Kg	☼	11/10/20 06:19	11/12/20 23:15	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.22	0.024	ug/Kg	☼	11/10/20 06:19	11/12/20 23:15	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.22	0.020	ug/Kg	☼	11/10/20 06:19	11/12/20 23:15	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*87*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:15*	*1*
13C4 PFHpA	*92*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:15*	*1*
13C4 PFOA	*94*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:15*	*1*
13C5 PFNA	*88*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:15*	*1*
13C2 PFDA	*88*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:15*	*1*
13C2 PFUnA	*90*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:15*	*1*
13C2 PFDoA	*90*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:15*	*1*
13C2 PFTeDA	*86*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:15*	*1*
13C3 PFBS	*81*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:15*	*1*
18O2 PFHxS	*83*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:15*	*1*
13C4 PFOS	*79*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:15*	*1*
d3-NMeFOSAA	*74*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:15*	*1*
d5-NEtFOSAA	*77*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:15*	*1*
13C3 HFPO-DA	*80*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:15*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-27
Date Collected: 10/30/20 18:00
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-20
Matrix: Solid
Percent Solids: 86.3

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.22	0.046	ug/Kg	☼	11/10/20 06:19	11/12/20 23:43	1
Perfluoroheptanoic acid (PFHpA)	ND		0.22	0.032	ug/Kg	☼	11/10/20 06:19	11/12/20 23:43	1
Perfluorooctanoic acid (PFOA)	ND		0.22	0.094	ug/Kg	☼	11/10/20 06:19	11/12/20 23:43	1
Perfluorononanoic acid (PFNA)	ND		0.22	0.039	ug/Kg	☼	11/10/20 06:19	11/12/20 23:43	1
Perfluorodecanoic acid (PFDA)	**0.082**	**J**	0.22	0.024	ug/Kg	☼	11/10/20 06:19	11/12/20 23:43	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.039	ug/Kg	☼	11/10/20 06:19	11/12/20 23:43	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.073	ug/Kg	☼	11/10/20 06:19	11/12/20 23:43	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.056	ug/Kg	☼	11/10/20 06:19	11/12/20 23:43	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.059	ug/Kg	☼	11/10/20 06:19	11/12/20 23:43	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.027	ug/Kg	☼	11/10/20 06:19	11/12/20 23:43	1
Perfluorohexanesulfonic acid (PFHxS)	**0.034**	**J**	0.22	0.034	ug/Kg	☼	11/10/20 06:19	11/12/20 23:43	1
Perfluorooctanesulfonic acid (PFOS)	**0.78**	**B**	0.54	0.22	ug/Kg	☼	11/10/20 06:19	11/12/20 23:43	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.42	ug/Kg	☼	11/10/20 06:19	11/12/20 23:43	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.40	ug/Kg	☼	11/10/20 06:19	11/12/20 23:43	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.22	0.029	ug/Kg	☼	11/10/20 06:19	11/12/20 23:43	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.27	0.12	ug/Kg	☼	11/10/20 06:19	11/12/20 23:43	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.22	0.024	ug/Kg	☼	11/10/20 06:19	11/12/20 23:43	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.22	0.020	ug/Kg	☼	11/10/20 06:19	11/12/20 23:43	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*89*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:43*	*1*
13C4 PFHpA	*92*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:43*	*1*
13C4 PFOA	*94*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:43*	*1*
13C5 PFNA	*89*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:43*	*1*
13C2 PFDA	*91*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:43*	*1*
13C2 PFUnA	*88*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:43*	*1*
13C2 PFDoA	*88*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:43*	*1*
13C2 PFTeDA	*91*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:43*	*1*
13C3 PFBS	*81*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:43*	*1*
18O2 PFHxS	*83*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:43*	*1*
13C4 PFOS	*82*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:43*	*1*
d3-NMeFOSAA	*78*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:43*	*1*
d5-NEtFOSAA	*79*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:43*	*1*
13C3 HFPO-DA	*79*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:43*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-28
Date Collected: 10/30/20 17:45
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-21
Matrix: Solid
Percent Solids: 84.4

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.069**	**J**	0.22	0.047	ug/Kg	☼	11/10/20 06:19	11/12/20 23:52	1
Perfluoroheptanoic acid (PFHpA)	ND		0.22	0.032	ug/Kg	☼	11/10/20 06:19	11/12/20 23:52	1
Perfluorooctanoic acid (PFOA)	ND		0.22	0.096	ug/Kg	☼	11/10/20 06:19	11/12/20 23:52	1
Perfluorononanoic acid (PFNA)	**0.12**	**J**	0.22	0.040	ug/Kg	☼	11/10/20 06:19	11/12/20 23:52	1
Perfluorodecanoic acid (PFDA)	**0.75**		0.22	0.025	ug/Kg	☼	11/10/20 06:19	11/12/20 23:52	1
Perfluoroundecanoic acid (PFUnA)	**0.35**		0.22	0.040	ug/Kg	☼	11/10/20 06:19	11/12/20 23:52	1
Perfluorododecanoic acid (PFDoA)	**0.29**		0.22	0.075	ug/Kg	☼	11/10/20 06:19	11/12/20 23:52	1
Perfluorotridecanoic acid (PFTriA)	**0.086**	**J**	0.22	0.057	ug/Kg	☼	11/10/20 06:19	11/12/20 23:52	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.060	ug/Kg	☼	11/10/20 06:19	11/12/20 23:52	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.028	ug/Kg	☼	11/10/20 06:19	11/12/20 23:52	1
Perfluorohexanesulfonic acid (PFHxS)	**0.058**	**J**	0.22	0.035	ug/Kg	☼	11/10/20 06:19	11/12/20 23:52	1
Perfluorooctanesulfonic acid (PFOS)	**0.79**	**B**	0.56	0.22	ug/Kg	☼	11/10/20 06:19	11/12/20 23:52	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.44	ug/Kg	☼	11/10/20 06:19	11/12/20 23:52	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.41	ug/Kg	☼	11/10/20 06:19	11/12/20 23:52	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.22	0.030	ug/Kg	☼	11/10/20 06:19	11/12/20 23:52	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.28	0.12	ug/Kg	☼	11/10/20 06:19	11/12/20 23:52	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.22	0.025	ug/Kg	☼	11/10/20 06:19	11/12/20 23:52	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.22	0.020	ug/Kg	☼	11/10/20 06:19	11/12/20 23:52	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*80*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:52*	*1*
13C4 PFHpA	*86*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:52*	*1*
13C4 PFOA	*89*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:52*	*1*
13C5 PFNA	*85*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:52*	*1*
13C2 PFDA	*81*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:52*	*1*
13C2 PFUnA	*84*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:52*	*1*
13C2 PFDoA	*88*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:52*	*1*
13C2 PFTeDA	*80*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:52*	*1*
13C3 PFBS	*74*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:52*	*1*
18O2 PFHxS	*78*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:52*	*1*
13C4 PFOS	*85*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:52*	*1*
d3-NMeFOSAA	*81*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:52*	*1*
d5-NEtFOSAA	*82*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:52*	*1*
13C3 HFPO-DA	*70*		*25 - 150*	*11/10/20 06:19*	*11/12/20 23:52*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-29
Date Collected: 10/30/20 18:10
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-22
Matrix: Solid
Percent Solids: 80.7

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.23	0.049	ug/Kg	☼	11/10/20 06:19	11/13/20 00:02	1
Perfluoroheptanoic acid (PFHpA)	ND		0.23	0.034	ug/Kg	☼	11/10/20 06:19	11/13/20 00:02	1
Perfluorooctanoic acid (PFOA)	ND		0.23	0.10	ug/Kg	☼	11/10/20 06:19	11/13/20 00:02	1
Perfluorononanoic acid (PFNA)	ND		0.23	0.042	ug/Kg	☼	11/10/20 06:19	11/13/20 00:02	1
Perfluorodecanoic acid (PFDA)	ND		0.23	0.026	ug/Kg	☼	11/10/20 06:19	11/13/20 00:02	1
Perfluoroundecanoic acid (PFUnA)	ND		0.23	0.042	ug/Kg	☼	11/10/20 06:19	11/13/20 00:02	1
Perfluorododecanoic acid (PFDoA)	ND		0.23	0.079	ug/Kg	☼	11/10/20 06:19	11/13/20 00:02	1
Perfluorotridecanoic acid (PFTriA)	ND		0.23	0.060	ug/Kg	☼	11/10/20 06:19	11/13/20 00:02	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.23	0.063	ug/Kg	☼	11/10/20 06:19	11/13/20 00:02	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.23	0.029	ug/Kg	☼	11/10/20 06:19	11/13/20 00:02	1
Perfluorohexanesulfonic acid (PFHxS)	**0.041**	**J**	0.23	0.036	ug/Kg	☼	11/10/20 06:19	11/13/20 00:02	1
Perfluorooctanesulfonic acid (PFOS)	**0.53**	**J B**	0.59	0.23	ug/Kg	☼	11/10/20 06:19	11/13/20 00:02	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.3	0.46	ug/Kg	☼	11/10/20 06:19	11/13/20 00:02	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.3	0.43	ug/Kg	☼	11/10/20 06:19	11/13/20 00:02	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.23	0.032	ug/Kg	☼	11/10/20 06:19	11/13/20 00:02	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.29	0.13	ug/Kg	☼	11/10/20 06:19	11/13/20 00:02	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.23	0.026	ug/Kg	☼	11/10/20 06:19	11/13/20 00:02	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.23	0.021	ug/Kg	☼	11/10/20 06:19	11/13/20 00:02	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*85*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:02*	*1*
13C4 PFHpA	*90*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:02*	*1*
13C4 PFOA	*94*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:02*	*1*
13C5 PFNA	*89*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:02*	*1*
13C2 PFDA	*88*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:02*	*1*
13C2 PFUnA	*86*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:02*	*1*
13C2 PFDoA	*90*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:02*	*1*
13C2 PFTeDA	*86*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:02*	*1*
13C3 PFBS	*78*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:02*	*1*
18O2 PFHxS	*84*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:02*	*1*
13C4 PFOS	*81*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:02*	*1*
d3-NMeFOSAA	*82*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:02*	*1*
d5-NEtFOSAA	*86*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:02*	*1*
13C3 HFPO-DA	*75*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:02*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-30
Date Collected: 10/30/20 21:00
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-23
Matrix: Solid
Percent Solids: 88.2

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.22	0.046	ug/Kg	☼	11/10/20 06:19	11/13/20 00:30	1
Perfluoroheptanoic acid (PFHpA)	ND		0.22	0.032	ug/Kg	☼	11/10/20 06:19	11/13/20 00:30	1
Perfluorooctanoic acid (PFOA)	ND		0.22	0.094	ug/Kg	☼	11/10/20 06:19	11/13/20 00:30	1
Perfluorononanoic acid (PFNA)	ND		0.22	0.039	ug/Kg	☼	11/10/20 06:19	11/13/20 00:30	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.024	ug/Kg	☼	11/10/20 06:19	11/13/20 00:30	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.039	ug/Kg	☼	11/10/20 06:19	11/13/20 00:30	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.073	ug/Kg	☼	11/10/20 06:19	11/13/20 00:30	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.056	ug/Kg	☼	11/10/20 06:19	11/13/20 00:30	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.059	ug/Kg	☼	11/10/20 06:19	11/13/20 00:30	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.027	ug/Kg	☼	11/10/20 06:19	11/13/20 00:30	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.22	0.034	ug/Kg	☼	11/10/20 06:19	11/13/20 00:30	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.54	0.22	ug/Kg	☼	11/10/20 06:19	11/13/20 00:30	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.42	ug/Kg	☼	11/10/20 06:19	11/13/20 00:30	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.40	ug/Kg	☼	11/10/20 06:19	11/13/20 00:30	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.22	0.029	ug/Kg	☼	11/10/20 06:19	11/13/20 00:30	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.27	0.12	ug/Kg	☼	11/10/20 06:19	11/13/20 00:30	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.22	0.024	ug/Kg	☼	11/10/20 06:19	11/13/20 00:30	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.22	0.020	ug/Kg	☼	11/10/20 06:19	11/13/20 00:30	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*80*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:30*	*1*
13C4 PFHpA	*89*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:30*	*1*
13C4 PFOA	*91*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:30*	*1*
13C5 PFNA	*85*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:30*	*1*
13C2 PFDA	*83*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:30*	*1*
13C2 PFUnA	*84*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:30*	*1*
13C2 PFDoA	*84*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:30*	*1*
13C2 PFTeDA	*81*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:30*	*1*
13C3 PFBS	*75*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:30*	*1*
18O2 PFHxS	*79*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:30*	*1*
13C4 PFOS	*78*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:30*	*1*
d3-NMeFOSAA	*67*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:30*	*1*
d5-NEtFOSAA	*71*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:30*	*1*
13C3 HFPO-DA	*73*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:30*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-31
Date Collected: 10/30/20 21:10
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-24
Matrix: Solid
Percent Solids: 86.0

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.22	0.047	ug/Kg	☼	11/10/20 06:19	11/13/20 00:39	1
Perfluoroheptanoic acid (PFHpA)	ND		0.22	0.032	ug/Kg	☼	11/10/20 06:19	11/13/20 00:39	1
Perfluorooctanoic acid (PFOA)	ND		0.22	0.096	ug/Kg	☼	11/10/20 06:19	11/13/20 00:39	1
Perfluorononanoic acid (PFNA)	ND		0.22	0.040	ug/Kg	☼	11/10/20 06:19	11/13/20 00:39	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.025	ug/Kg	☼	11/10/20 06:19	11/13/20 00:39	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.040	ug/Kg	☼	11/10/20 06:19	11/13/20 00:39	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.075	ug/Kg	☼	11/10/20 06:19	11/13/20 00:39	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.057	ug/Kg	☼	11/10/20 06:19	11/13/20 00:39	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.060	ug/Kg	☼	11/10/20 06:19	11/13/20 00:39	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.028	ug/Kg	☼	11/10/20 06:19	11/13/20 00:39	1
Perfluorohexanesulfonic acid (PFHxS)	**0.049**	**J**	0.22	0.035	ug/Kg	☼	11/10/20 06:19	11/13/20 00:39	1
Perfluorooctanesulfonic acid (PFOS)	**0.89**	**B**	0.56	0.22	ug/Kg	☼	11/10/20 06:19	11/13/20 00:39	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.43	ug/Kg	☼	11/10/20 06:19	11/13/20 00:39	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.41	ug/Kg	☼	11/10/20 06:19	11/13/20 00:39	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.22	0.030	ug/Kg	☼	11/10/20 06:19	11/13/20 00:39	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.28	0.12	ug/Kg	☼	11/10/20 06:19	11/13/20 00:39	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.22	0.025	ug/Kg	☼	11/10/20 06:19	11/13/20 00:39	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.22	0.020	ug/Kg	☼	11/10/20 06:19	11/13/20 00:39	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*77*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:39*	*1*
13C4 PFHpA	*88*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:39*	*1*
13C4 PFOA	*92*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:39*	*1*
13C5 PFNA	*89*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:39*	*1*
13C2 PFDA	*88*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:39*	*1*
13C2 PFUnA	*92*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:39*	*1*
13C2 PFDoA	*93*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:39*	*1*
13C2 PFTeDA	*88*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:39*	*1*
13C3 PFBS	*74*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:39*	*1*
18O2 PFHxS	*81*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:39*	*1*
13C4 PFOS	*80*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:39*	*1*
d3-NMeFOSAA	*90*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:39*	*1*
d5-NEtFOSAA	*104*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:39*	*1*
13C3 HFPO-DA	*66*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:39*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: AKA-SB1-01
Date Collected: 10/27/20 18:00
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-25
Matrix: Solid
Percent Solids: 93.1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.088**	**J I**	0.20	0.042	ug/Kg	☼	11/10/20 06:19	11/13/20 00:48	1
Perfluoroheptanoic acid (PFHpA)	**0.063**	**J**	0.20	0.029	ug/Kg	☼	11/10/20 06:19	11/13/20 00:48	1
Perfluorooctanoic acid (PFOA)	**0.16**	**J**	0.20	0.087	ug/Kg	☼	11/10/20 06:19	11/13/20 00:48	1
Perfluorononanoic acid (PFNA)	**0.097**	**J**	0.20	0.036	ug/Kg	☼	11/10/20 06:19	11/13/20 00:48	1
Perfluorodecanoic acid (PFDA)	**0.22**		0.20	0.022	ug/Kg	☼	11/10/20 06:19	11/13/20 00:48	1
Perfluoroundecanoic acid (PFUnA)	**0.13**	**J**	0.20	0.036	ug/Kg	☼	11/10/20 06:19	11/13/20 00:48	1
Perfluorododecanoic acid (PFDoA)	**0.17**	**J**	0.20	0.068	ug/Kg	☼	11/10/20 06:19	11/13/20 00:48	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051	ug/Kg	☼	11/10/20 06:19	11/13/20 00:48	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054	ug/Kg	☼	11/10/20 06:19	11/13/20 00:48	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg	☼	11/10/20 06:19	11/13/20 00:48	1
Perfluorohexanesulfonic acid (PFHxS)	**0.12**	**J**	0.20	0.031	ug/Kg	☼	11/10/20 06:19	11/13/20 00:48	1
Perfluorooctanesulfonic acid (PFOS)	**5.8**	**B**	0.50	0.20	ug/Kg	☼	11/10/20 06:19	11/13/20 00:48	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg	☼	11/10/20 06:19	11/13/20 00:48	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg	☼	11/10/20 06:19	11/13/20 00:48	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.027	ug/Kg	☼	11/10/20 06:19	11/13/20 00:48	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.25	0.11	ug/Kg	☼	11/10/20 06:19	11/13/20 00:48	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.022	ug/Kg	☼	11/10/20 06:19	11/13/20 00:48	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg	☼	11/10/20 06:19	11/13/20 00:48	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*83*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:48*	*1*
13C4 PFHpA	*92*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:48*	*1*
13C4 PFOA	*91*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:48*	*1*
13C5 PFNA	*89*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:48*	*1*
13C2 PFDA	*88*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:48*	*1*
13C2 PFUnA	*87*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:48*	*1*
13C2 PFDoA	*88*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:48*	*1*
13C2 PFTeDA	*88*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:48*	*1*
13C3 PFBS	*75*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:48*	*1*
18O2 PFHxS	*84*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:48*	*1*
13C4 PFOS	*82*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:48*	*1*
d3-NMeFOSAA	*71*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:48*	*1*
d5-NEtFOSAA	*80*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:48*	*1*
13C3 HFPO-DA	*74*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:48*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: AKA-SB1-02

Date Collected: 10/27/20 18:15
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-26

Matrix: Solid
Percent Solids: 90.1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.72**		0.20	0.043	ug/Kg	☼	11/10/20 06:19	11/13/20 00:58	1
Perfluoroheptanoic acid (PFHpA)	**0.51**		0.20	0.030	ug/Kg	☼	11/10/20 06:19	11/13/20 00:58	1
Perfluorooctanoic acid (PFOA)	**0.56**		0.20	0.088	ug/Kg	☼	11/10/20 06:19	11/13/20 00:58	1
Perfluorononanoic acid (PFNA)	**0.056**	**J**	0.20	0.037	ug/Kg	☼	11/10/20 06:19	11/13/20 00:58	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.023	ug/Kg	☼	11/10/20 06:19	11/13/20 00:58	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.037	ug/Kg	☼	11/10/20 06:19	11/13/20 00:58	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.069	ug/Kg	☼	11/10/20 06:19	11/13/20 00:58	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.052	ug/Kg	☼	11/10/20 06:19	11/13/20 00:58	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.055	ug/Kg	☼	11/10/20 06:19	11/13/20 00:58	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.026	ug/Kg	☼	11/10/20 06:19	11/13/20 00:58	1
Perfluorohexanesulfonic acid (PFHxS)	**0.36**		0.20	0.032	ug/Kg	☼	11/10/20 06:19	11/13/20 00:58	1
Perfluorooctanesulfonic acid (PFOS)	**20**	**E B**	0.51	0.20	ug/Kg	☼	11/10/20 06:19	11/13/20 00:58	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.40	ug/Kg	☼	11/10/20 06:19	11/13/20 00:58	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.38	ug/Kg	☼	11/10/20 06:19	11/13/20 00:58	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.028	ug/Kg	☼	11/10/20 06:19	11/13/20 00:58	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.26	0.11	ug/Kg	☼	11/10/20 06:19	11/13/20 00:58	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.023	ug/Kg	☼	11/10/20 06:19	11/13/20 00:58	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg	☼	11/10/20 06:19	11/13/20 00:58	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*76*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:58*	*1*
13C4 PFHpA	*84*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:58*	*1*
13C4 PFOA	*83*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:58*	*1*
13C5 PFNA	*79*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:58*	*1*
13C2 PFDA	*83*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:58*	*1*
13C2 PFUnA	*80*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:58*	*1*
13C2 PFDoA	*83*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:58*	*1*
13C2 PFTeDA	*83*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:58*	*1*
13C3 PFBS	*61*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:58*	*1*
18O2 PFHxS	*64*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:58*	*1*
13C4 PFOS	*62*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:58*	*1*
d3-NMeFOSAA	*65*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:58*	*1*
d5-NEtFOSAA	*68*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:58*	*1*
13C3 HFPO-DA	*70*		*25 - 150*	*11/10/20 06:19*	*11/13/20 00:58*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: AKA-SB1-12

Date Collected: 10/27/20 18:05
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-27

Matrix: Solid
Percent Solids: 88.8

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**0.64**		0.22	0.045	ug/Kg	☼	11/10/20 06:19	11/13/20 01:07	1
Perfluoroheptanoic acid (PFHpA)	**0.60**		0.22	0.031	ug/Kg	☼	11/10/20 06:19	11/13/20 01:07	1
Perfluorooctanoic acid (PFOA)	**0.89**		0.22	0.093	ug/Kg	☼	11/10/20 06:19	11/13/20 01:07	1
Perfluorononanoic acid (PFNA)	**0.068**	**J**	0.22	0.039	ug/Kg	☼	11/10/20 06:19	11/13/20 01:07	1
Perfluorodecanoic acid (PFDA)	ND		0.22	0.024	ug/Kg	☼	11/10/20 06:19	11/13/20 01:07	1
Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.039	ug/Kg	☼	11/10/20 06:19	11/13/20 01:07	1
Perfluorododecanoic acid (PFDoA)	ND		0.22	0.072	ug/Kg	☼	11/10/20 06:19	11/13/20 01:07	1
Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.055	ug/Kg	☼	11/10/20 06:19	11/13/20 01:07	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.058	ug/Kg	☼	11/10/20 06:19	11/13/20 01:07	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.22	0.027	ug/Kg	☼	11/10/20 06:19	11/13/20 01:07	1
Perfluorohexanesulfonic acid (PFHxS)	**0.44**		0.22	0.033	ug/Kg	☼	11/10/20 06:19	11/13/20 01:07	1
Perfluorooctanesulfonic acid (PFOS)	**22**	**E B**	0.54	0.22	ug/Kg	☼	11/10/20 06:19	11/13/20 01:07	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.42	ug/Kg	☼	11/10/20 06:19	11/13/20 01:07	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.40	ug/Kg	☼	11/10/20 06:19	11/13/20 01:07	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.22	0.029	ug/Kg	☼	11/10/20 06:19	11/13/20 01:07	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.27	0.12	ug/Kg	☼	11/10/20 06:19	11/13/20 01:07	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.22	0.024	ug/Kg	☼	11/10/20 06:19	11/13/20 01:07	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.22	0.019	ug/Kg	☼	11/10/20 06:19	11/13/20 01:07	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*80*		*25 - 150*	*11/10/20 06:19*	*11/13/20 01:07*	*1*
13C4 PFHpA	*88*		*25 - 150*	*11/10/20 06:19*	*11/13/20 01:07*	*1*
13C4 PFOA	*94*		*25 - 150*	*11/10/20 06:19*	*11/13/20 01:07*	*1*
13C5 PFNA	*86*		*25 - 150*	*11/10/20 06:19*	*11/13/20 01:07*	*1*
13C2 PFDA	*85*		*25 - 150*	*11/10/20 06:19*	*11/13/20 01:07*	*1*
13C2 PFUnA	*90*		*25 - 150*	*11/10/20 06:19*	*11/13/20 01:07*	*1*
13C2 PFDoA	*89*		*25 - 150*	*11/10/20 06:19*	*11/13/20 01:07*	*1*
13C2 PFTeDA	*91*		*25 - 150*	*11/10/20 06:19*	*11/13/20 01:07*	*1*
13C3 PFBS	*69*		*25 - 150*	*11/10/20 06:19*	*11/13/20 01:07*	*1*
18O2 PFHxS	*73*		*25 - 150*	*11/10/20 06:19*	*11/13/20 01:07*	*1*
13C4 PFOS	*71*		*25 - 150*	*11/10/20 06:19*	*11/13/20 01:07*	*1*
d3-NMeFOSAA	*72*		*25 - 150*	*11/10/20 06:19*	*11/13/20 01:07*	*1*
d5-NEtFOSAA	*76*		*25 - 150*	*11/10/20 06:19*	*11/13/20 01:07*	*1*
13C3 HFPO-DA	*72*		*25 - 150*	*11/10/20 06:19*	*11/13/20 01:07*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: FB-SS-12

Date Collected: 10/29/20 21:00
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-28

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		1.8	0.52	ng/L		11/04/20 20:28	11/07/20 07:32	1
Perfluoroheptanoic acid (PFHpA)	ND		1.8	0.22	ng/L		11/04/20 20:28	11/07/20 07:32	1
Perfluorooctanoic acid (PFOA)	ND		1.8	0.76	ng/L		11/04/20 20:28	11/07/20 07:32	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.24	ng/L		11/04/20 20:28	11/07/20 07:32	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.28	ng/L		11/04/20 20:28	11/07/20 07:32	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.98	ng/L		11/04/20 20:28	11/07/20 07:32	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.49	ng/L		11/04/20 20:28	11/07/20 07:32	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		11/04/20 20:28	11/07/20 07:32	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.65	ng/L		11/04/20 20:28	11/07/20 07:32	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.8	0.18	ng/L		11/04/20 20:28	11/07/20 07:32	1
Perfluorohexanesulfonic acid (PFHxS)	ND		1.8	0.51	ng/L		11/04/20 20:28	11/07/20 07:32	1
Perfluorooctanesulfonic acid (PFOS)	ND		1.8	0.48	ng/L		11/04/20 20:28	11/07/20 07:32	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.5	1.1	ng/L		11/04/20 20:28	11/07/20 07:32	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.5	1.2	ng/L		11/04/20 20:28	11/07/20 07:32	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.8	0.21	ng/L		11/04/20 20:28	11/07/20 07:32	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.6	1.3	ng/L		11/04/20 20:28	11/07/20 07:32	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.8	0.28	ng/L		11/04/20 20:28	11/07/20 07:32	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.8	0.36	ng/L		11/04/20 20:28	11/07/20 07:32	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*99*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:32*	*1*
13C4 PFHpA	*104*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:32*	*1*
13C4 PFOA	*109*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:32*	*1*
13C5 PFNA	*106*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:32*	*1*
13C2 PFDA	*109*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:32*	*1*
13C2 PFUnA	*96*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:32*	*1*
13C2 PFDoA	*85*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:32*	*1*
13C2 PFTeDA	*104*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:32*	*1*
13C3 PFBS	*104*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:32*	*1*
18O2 PFHxS	*114*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:32*	*1*
13C4 PFOS	*107*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:32*	*1*
d3-NMeFOSAA	*109*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:32*	*1*
d5-NEtFOSAA	*102*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:32*	*1*
13C3 HFPO-DA	*90*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:32*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: EB-SS-12

Date Collected: 10/29/20 21:15
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-29

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		1.9	0.55	ng/L		11/04/20 20:28	11/07/20 07:41	1
Perfluoroheptanoic acid (PFHpA)	ND		1.9	0.24	ng/L		11/04/20 20:28	11/07/20 07:41	1
Perfluorooctanoic acid (PFOA)	ND		1.9	0.81	ng/L		11/04/20 20:28	11/07/20 07:41	1
Perfluorononanoic acid (PFNA)	ND		1.9	0.26	ng/L		11/04/20 20:28	11/07/20 07:41	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.29	ng/L		11/04/20 20:28	11/07/20 07:41	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.0	ng/L		11/04/20 20:28	11/07/20 07:41	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.52	ng/L		11/04/20 20:28	11/07/20 07:41	1
Perfluorotridecanoic acid (PFTriA)	ND		1.9	1.2	ng/L		11/04/20 20:28	11/07/20 07:41	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9	0.69	ng/L		11/04/20 20:28	11/07/20 07:41	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.9	0.19	ng/L		11/04/20 20:28	11/07/20 07:41	1
Perfluorohexanesulfonic acid (PFHxS)	ND		1.9	0.54	ng/L		11/04/20 20:28	11/07/20 07:41	1
Perfluorooctanesulfonic acid (PFOS)	ND		1.9	0.51	ng/L		11/04/20 20:28	11/07/20 07:41	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.8	1.1	ng/L		11/04/20 20:28	11/07/20 07:41	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.8	1.2	ng/L		11/04/20 20:28	11/07/20 07:41	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.9	0.23	ng/L		11/04/20 20:28	11/07/20 07:41	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.8	1.4	ng/L		11/04/20 20:28	11/07/20 07:41	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.9	0.30	ng/L		11/04/20 20:28	11/07/20 07:41	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.38	ng/L		11/04/20 20:28	11/07/20 07:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*114*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:41*	*1*
13C4 PFHpA	*122*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:41*	*1*
13C4 PFOA	*133*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:41*	*1*
13C5 PFNA	*125*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:41*	*1*
13C2 PFDA	*119*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:41*	*1*
13C2 PFUnA	*116*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:41*	*1*
13C2 PFDoA	*102*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:41*	*1*
13C2 PFTeDA	*101*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:41*	*1*
13C3 PFBS	*116*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:41*	*1*
18O2 PFHxS	*128*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:41*	*1*
13C4 PFOS	*128*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:41*	*1*
d3-NMeFOSAA	*118*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:41*	*1*
d5-NEtFOSAA	*110*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:41*	*1*
13C3 HFPO-DA	*110*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:41*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: EB-SS-22

Date Collected: 10/30/20 22:00
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-30

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.57	ng/L		11/04/20 20:28	11/07/20 07:50	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.24	ng/L		11/04/20 20:28	11/07/20 07:50	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.83	ng/L		11/04/20 20:28	11/07/20 07:50	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.26	ng/L		11/04/20 20:28	11/07/20 07:50	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.30	ng/L		11/04/20 20:28	11/07/20 07:50	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		11/04/20 20:28	11/07/20 07:50	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.54	ng/L		11/04/20 20:28	11/07/20 07:50	1
Perfluorotridecanoic acid (PFTriA)	ND		2.0	1.3	ng/L		11/04/20 20:28	11/07/20 07:50	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.71	ng/L		11/04/20 20:28	11/07/20 07:50	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.20	ng/L		11/04/20 20:28	11/07/20 07:50	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.56	ng/L		11/04/20 20:28	11/07/20 07:50	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	0.53	ng/L		11/04/20 20:28	11/07/20 07:50	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.9	1.2	ng/L		11/04/20 20:28	11/07/20 07:50	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.9	1.3	ng/L		11/04/20 20:28	11/07/20 07:50	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.0	0.23	ng/L		11/04/20 20:28	11/07/20 07:50	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.9	1.5	ng/L		11/04/20 20:28	11/07/20 07:50	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.0	0.31	ng/L		11/04/20 20:28	11/07/20 07:50	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0	0.39	ng/L		11/04/20 20:28	11/07/20 07:50	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*86*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:50*	*1*
13C4 PFHpA	*91*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:50*	*1*
13C4 PFOA	*98*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:50*	*1*
13C5 PFNA	*86*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:50*	*1*
13C2 PFDA	*85*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:50*	*1*
13C2 PFUnA	*79*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:50*	*1*
13C2 PFDoA	*69*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:50*	*1*
13C2 PFTeDA	*77*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:50*	*1*
13C3 PFBS	*93*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:50*	*1*
18O2 PFHxS	*99*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:50*	*1*
13C4 PFOS	*90*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:50*	*1*
d3-NMeFOSAA	*96*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:50*	*1*
d5-NEtFOSAA	*80*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:50*	*1*
13C3 HFPO-DA	*77*		*25 - 150*	*11/04/20 20:28*	*11/07/20 07:50*	*1*

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

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)	PFDoA (25-150)	PFTDA (25-150)
320-66250-1	SS-08	84	90	86	87	81	83	78	81
320-66250-1 MS	SS-08	88	94	91	89	86	87	86	85
320-66250-1 MSD	SS-08	80	82	84	84	78	74	77	82
320-66250-2	SS-09	80	86	89	87	83	80	83	81
320-66250-3	SS-10	81	84	86	81	76	74	76	74
320-66250-4	SS-11	86	88	87	82	77	76	81	71
320-66250-5	SS-12	80	88	86	86	82	77	82	75
320-66250-6	SS-13	90	94	92	74	90	87	91	87
320-66250-7	SS-14	83	91	90	86	82	83	84	84
320-66250-8	SS-15	79	88	88	86	84	86	87	86
320-66250-9	SS-16	76	86	90	87	84	82	85	82
320-66250-10	SS-17	89	95	89	81	85	87	74	72
320-66250-10 MS	SS-17	90	89	85	85	84	87	82	83
320-66250-10 MSD	SS-17	91	94	89	87	91	80	93	86
320-66250-11	SS-18	87	88	90	79	78	84	77	74
320-66250-12	SS-19	86	90	85	84	82	82	75	74
320-66250-13	SS-20	89	90	90	83	91	81	86	83
320-66250-14	SS-21	86	85	91	82	79	84	73	78
320-66250-15	SS-22	88	91	89	85	85	89	78	77
320-66250-16	SS-23	84	89	90	86	85	80	88	64
320-66250-17	SS-24	82	87	83	80	87	84	83	72
320-66250-18	SS-25	86	89	85	81	83	74	76	59
320-66250-19	SS-26	87	92	94	88	88	90	90	86
320-66250-19 MS	SS-26	82	89	88	87	86	83	88	85
320-66250-19 MSD	SS-26	90	93	96	90	92	90	89	87
320-66250-20	SS-27	89	92	94	89	91	88	88	91
320-66250-21	SS-28	80	86	89	85	81	84	88	80
320-66250-22	SS-29	85	90	94	89	88	86	90	86
320-66250-23	SS-30	80	89	91	85	83	84	84	81
320-66250-24	SS-31	77	88	92	89	88	92	93	88
320-66250-25	AKA-SB1-01	83	92	91	89	88	87	88	88
320-66250-26	AKA-SB1-02	76	84	83	79	83	80	83	83
320-66250-27	AKA-SB1-12	80	88	94	86	85	90	89	91
LCS 320-430058/2-A	Lab Control Sample	80	89	88	85	79	78	79	77
LCS 320-430059/2-A	Lab Control Sample	85	91	87	78	82	79	83	73
LCS 320-430060/2-A	Lab Control Sample	84	97	92	87	86	82	84	85
MB 320-430058/1-A	Method Blank	83	91	89	87	84	78	78	79
MB 320-430059/1-A	Method Blank	83	90	86	81	81	81	77	80
MB 320-430060/1-A	Method Blank	87	94	93	87	89	83	85	85

		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)		
320-66250-1	SS-08	75	80	78	70	72	72		
320-66250-1 MS	SS-08	75	81	78	73	77	74		
320-66250-1 MSD	SS-08	70	75	74	64	69	69		
320-66250-2	SS-09	61	67	65	64	67	72		
320-66250-3	SS-10	72	76	74	70	71	71		
320-66250-4	SS-11	72	78	74	70	77	73		
320-66250-5	SS-12	67	72	69	43	48	71		

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

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	C3PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	d3NMFOS (25-150)	d5NEFOS (25-150)	HFPODA (25-150)		
320-66250-6	SS-13	79	87	74	78	80	76		
320-66250-7	SS-14	74	81	78	30	31	73		
320-66250-8	SS-15	72	80	77	50	54	67		
320-66250-9	SS-16	71	75	75	78	87	67		
320-66250-10	SS-17	79	80	81	87	81	85		
320-66250-10 MS	SS-17	80	80	80	82	71	84		
320-66250-10 MSD	SS-17	83	85	77	77	73	89		
320-66250-11	SS-18	76	81	77	91	90	85		
320-66250-12	SS-19	76	77	77	84	80	83		
320-66250-13	SS-20	79	81	81	94	104	81		
320-66250-14	SS-21	76	76	75	50	44	79		
320-66250-15	SS-22	86	84	80	80	75	83		
320-66250-16	SS-23	80	89	81	56	60	79		
320-66250-17	SS-24	74	84	82	77	79	79		
320-66250-18	SS-25	76	76	73	70	70	79		
320-66250-19	SS-26	81	83	79	74	77	80		
320-66250-19 MS	SS-26	75	81	78	71	74	74		
320-66250-19 MSD	SS-26	81	85	83	80	80	82		
320-66250-20	SS-27	81	83	82	78	79	79		
320-66250-21	SS-28	74	78	85	81	82	70		
320-66250-22	SS-29	78	84	81	82	86	75		
320-66250-23	SS-30	75	79	78	67	71	73		
320-66250-24	SS-31	74	81	80	90	104	66		
320-66250-25	AKA-SB1-01	75	84	82	71	80	74		
320-66250-26	AKA-SB1-02	61	64	62	65	68	70		
320-66250-27	AKA-SB1-12	69	73	71	72	76	72		
LCS 320-430058/2-A	Lab Control Sample	77	82	81	62	63	73		
LCS 320-430059/2-A	Lab Control Sample	83	86	85	86	86	85		
LCS 320-430060/2-A	Lab Control Sample	82	88	86	66	68	80		
MB 320-430058/1-A	Method Blank	81	85	84	64	68	77		
MB 320-430059/1-A	Method Blank	83	86	82	92	101	81		
MB 320-430060/1-A	Method Blank	84	90	89	66	67	82		

Surrogate Legend

PFHxA = 13C2 PFHxA
C4PFHA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA
PFUnA = 13C2 PFUnA
PFDoA = 13C2 PFDoA
PFTDA = 13C2 PFTeDA
C3PFBS = 13C3 PFBS
PFHxS = 18O2 PFHxS
PFOS = 13C4 PFOS
d3NMFOS = d3-NMeFOSAA
d5NEFOS = d5-NEtFOSAA
HFPODA = 13C3 HFPO-DA

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

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)	PFDoA (25-150)	PFTDA (25-150)
320-66250-28	FB-SS-12	99	104	109	106	109	96	85	104
320-66250-29	EB-SS-12	114	122	133	125	119	116	102	101
320-66250-30	EB-SS-22	86	91	98	86	85	79	69	77
LCS 320-428478/2-A	Lab Control Sample	91	97	98	98	98	92	92	87
LCSD 320-428478/3-A	Lab Control Sample Dup	89	83	98	91	96	95	88	90
MB 320-428478/1-A	Method Blank	89	102	103	98	98	81	78	74

		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)		
320-66250-28	FB-SS-12	104	114	107	109	102	90		
320-66250-29	EB-SS-12	116	128	128	118	110	110		
320-66250-30	EB-SS-22	93	99	90	96	80	77		
LCS 320-428478/2-A	Lab Control Sample	94	105	106	96	84	84		
LCSD 320-428478/3-A	Lab Control Sample Dup	97	102	113	113	117	77		
MB 320-428478/1-A	Method Blank	97	101	105	92	55	86		

Surrogate Legend

PFHxA = 13C2 PFHxA
C4PFHA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA
PFUnA = 13C2 PFUnA
PFDoA = 13C2 PFDoA
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

Lab Sample ID: MB 320-428478/1-A
Matrix: Water
Analysis Batch: 429272

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 428478

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.58	ng/L		11/04/20 20:28	11/07/20 04:47	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.25	ng/L		11/04/20 20:28	11/07/20 04:47	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.85	ng/L		11/04/20 20:28	11/07/20 04:47	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.27	ng/L		11/04/20 20:28	11/07/20 04:47	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.31	ng/L		11/04/20 20:28	11/07/20 04:47	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		11/04/20 20:28	11/07/20 04:47	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.55	ng/L		11/04/20 20:28	11/07/20 04:47	1
Perfluorotridecanoic acid (PFTriA)	ND		2.0	1.3	ng/L		11/04/20 20:28	11/07/20 04:47	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.73	ng/L		11/04/20 20:28	11/07/20 04:47	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.20	ng/L		11/04/20 20:28	11/07/20 04:47	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.57	ng/L		11/04/20 20:28	11/07/20 04:47	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	0.54	ng/L		11/04/20 20:28	11/07/20 04:47	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		5.0	1.2	ng/L		11/04/20 20:28	11/07/20 04:47	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		5.0	1.3	ng/L		11/04/20 20:28	11/07/20 04:47	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.0	0.24	ng/L		11/04/20 20:28	11/07/20 04:47	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		4.0	1.5	ng/L		11/04/20 20:28	11/07/20 04:47	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.0	0.32	ng/L		11/04/20 20:28	11/07/20 04:47	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0	0.40	ng/L		11/04/20 20:28	11/07/20 04:47	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*89*		*25 - 150*	*11/04/20 20:28*	*11/07/20 04:47*	*1*
13C4 PFHpA	*102*		*25 - 150*	*11/04/20 20:28*	*11/07/20 04:47*	*1*
13C4 PFOA	*103*		*25 - 150*	*11/04/20 20:28*	*11/07/20 04:47*	*1*
13C5 PFNA	*98*		*25 - 150*	*11/04/20 20:28*	*11/07/20 04:47*	*1*
13C2 PFDA	*98*		*25 - 150*	*11/04/20 20:28*	*11/07/20 04:47*	*1*
13C2 PFUnA	*81*		*25 - 150*	*11/04/20 20:28*	*11/07/20 04:47*	*1*
13C2 PFDoA	*78*		*25 - 150*	*11/04/20 20:28*	*11/07/20 04:47*	*1*
13C2 PFTeDA	*74*		*25 - 150*	*11/04/20 20:28*	*11/07/20 04:47*	*1*
13C3 PFBS	*97*		*25 - 150*	*11/04/20 20:28*	*11/07/20 04:47*	*1*
18O2 PFHxS	*101*		*25 - 150*	*11/04/20 20:28*	*11/07/20 04:47*	*1*
13C4 PFOS	*105*		*25 - 150*	*11/04/20 20:28*	*11/07/20 04:47*	*1*
d3-NMeFOSAA	*92*		*25 - 150*	*11/04/20 20:28*	*11/07/20 04:47*	*1*
d5-NEtFOSAA	*55*		*25 - 150*	*11/04/20 20:28*	*11/07/20 04:47*	*1*
13C3 HFPO-DA	*86*		*25 - 150*	*11/04/20 20:28*	*11/07/20 04:47*	*1*

Lab Sample ID: LCS 320-428478/2-A
Matrix: Water
Analysis Batch: 429272

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 428478

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	40.0	45.2		ng/L		113	73 - 133
Perfluoroheptanoic acid (PFHpA)	40.0	43.2		ng/L		108	72 - 132
Perfluorooctanoic acid (PFOA)	40.0	42.6		ng/L		107	70 - 130
Perfluorononanoic acid (PFNA)	40.0	47.9		ng/L		120	75 - 135

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-428478/2-A
Matrix: Water
Analysis Batch: 429272

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 428478

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorodecanoic acid (PFDA)	40.0	43.7		ng/L		109	76 - 136
Perfluoroundecanoic acid (PFUnA)	40.0	39.7		ng/L		99	68 - 128
Perfluorododecanoic acid (PFDoA)	40.0	51.9		ng/L		130	71 - 131
Perfluorotridecanoic acid (PFTriA)	40.0	43.0		ng/L		107	71 - 131
Perfluorotetradecanoic acid (PFTeA)	40.0	44.3		ng/L		111	70 - 130
Perfluorobutanesulfonic acid (PFBS)	35.4	40.1		ng/L		113	67 - 127
Perfluorohexanesulfonic acid (PFHxS)	36.4	39.1		ng/L		107	59 - 119
Perfluorooctanesulfonic acid (PFOS)	37.1	37.6		ng/L		101	70 - 130
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	37.3	38.0		ng/L		102	75 - 135
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	40.0	44.7		ng/L		112	51 - 173
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	37.7	33.8		ng/L		90	54 - 114
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	37.7	40.0		ng/L		106	79 - 139

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*91*		*25 - 150*
13C4 PFHpA	*97*		*25 - 150*
13C4 PFOA	*98*		*25 - 150*
13C5 PFNA	*98*		*25 - 150*
13C2 PFDA	*98*		*25 - 150*
13C2 PFUnA	*92*		*25 - 150*
13C2 PFDoA	*92*		*25 - 150*
13C2 PFTeDA	*87*		*25 - 150*
13C3 PFBS	*94*		*25 - 150*
18O2 PFHxS	*105*		*25 - 150*
13C4 PFOS	*106*		*25 - 150*
d3-NMeFOSAA	*96*		*25 - 150*
d5-NEtFOSAA	*84*		*25 - 150*
13C3 HFPO-DA	*84*		*25 - 150*

Lab Sample ID: LCSD 320-428478/3-A
Matrix: Water
Analysis Batch: 429793

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 428478

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	40.0	43.6		ng/L		109	73 - 133	4	30
Perfluoroheptanoic acid (PFHpA)	40.0	45.0		ng/L		113	72 - 132	4	30
Perfluorooctanoic acid (PFOA)	40.0	39.1		ng/L		98	70 - 130	9	30
Perfluorononanoic acid (PFNA)	40.0	46.2		ng/L		115	75 - 135	4	30
Perfluorodecanoic acid (PFDA)	40.0	46.3		ng/L		116	76 - 136	6	30
Perfluoroundecanoic acid (PFUnA)	40.0	42.5		ng/L		106	68 - 128	7	30

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 320-428478/3-A
Matrix: Water
Analysis Batch: 429793

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 428478

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorododecanoic acid (PFDoA)			40.0	50.2		ng/L		125	71 - 131	3	30
Perfluorotridecanoic acid (PFTriA)			40.0	43.8		ng/L		110	71 - 131	2	30
Perfluorotetradecanoic acid (PFTeA)			40.0	49.3		ng/L		123	70 - 130	11	30
Perfluorobutanesulfonic acid (PFBS)			35.4	38.4		ng/L		108	67 - 127	4	30
Perfluorohexanesulfonic acid (PFHxS)			36.4	40.1		ng/L		110	59 - 119	3	30
Perfluorooctanesulfonic acid (PFOS)			37.1	39.8		ng/L		107	70 - 130	6	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid			37.3	37.8		ng/L		101	75 - 135	1	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)			40.0	45.1		ng/L		113	51 - 173	1	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid			37.7	34.7		ng/L		92	54 - 114	2	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)			37.7	36.3		ng/L		96	79 - 139	10	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C2 PFHxA	*89*		*25 - 150*
13C4 PFHpA	*83*		*25 - 150*
13C4 PFOA	*98*		*25 - 150*
13C5 PFNA	*91*		*25 - 150*
13C2 PFDA	*96*		*25 - 150*
13C2 PFUnA	*95*		*25 - 150*
13C2 PFDoA	*88*		*25 - 150*
13C2 PFTeDA	*90*		*25 - 150*
13C3 PFBS	*97*		*25 - 150*
18O2 PFHxS	*102*		*25 - 150*
13C4 PFOS	*113*		*25 - 150*
d3-NMeFOSAA	*113*		*25 - 150*
d5-NEtFOSAA	*117*		*25 - 150*
13C3 HFPO-DA	*77*		*25 - 150*

Lab Sample ID: MB 320-430058/1-A
Matrix: Solid
Analysis Batch: 431265

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 430058

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.042	ug/Kg		11/10/20 06:12	11/13/20 01:44	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.029	ug/Kg		11/10/20 06:12	11/13/20 01:44	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.086	ug/Kg		11/10/20 06:12	11/13/20 01:44	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.036	ug/Kg		11/10/20 06:12	11/13/20 01:44	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg		11/10/20 06:12	11/13/20 01:44	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036	ug/Kg		11/10/20 06:12	11/13/20 01:44	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.067	ug/Kg		11/10/20 06:12	11/13/20 01:44	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051	ug/Kg		11/10/20 06:12	11/13/20 01:44	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054	ug/Kg		11/10/20 06:12	11/13/20 01:44	1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-430058/1-A
Matrix: Solid
Analysis Batch: 431265

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 430058

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg		11/10/20 06:12	11/13/20 01:44	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.031	ug/Kg		11/10/20 06:12	11/13/20 01:44	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.50	0.20	ug/Kg		11/10/20 06:12	11/13/20 01:44	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg		11/10/20 06:12	11/13/20 01:44	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg		11/10/20 06:12	11/13/20 01:44	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.027	ug/Kg		11/10/20 06:12	11/13/20 01:44	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.25	0.11	ug/Kg		11/10/20 06:12	11/13/20 01:44	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.022	ug/Kg		11/10/20 06:12	11/13/20 01:44	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg		11/10/20 06:12	11/13/20 01:44	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*83*		*25 - 150*	*11/10/20 06:12*	*11/13/20 01:44*	*1*
13C4 PFHpA	*91*		*25 - 150*	*11/10/20 06:12*	*11/13/20 01:44*	*1*
13C4 PFOA	*89*		*25 - 150*	*11/10/20 06:12*	*11/13/20 01:44*	*1*
13C5 PFNA	*87*		*25 - 150*	*11/10/20 06:12*	*11/13/20 01:44*	*1*
13C2 PFDA	*84*		*25 - 150*	*11/10/20 06:12*	*11/13/20 01:44*	*1*
13C2 PFUnA	*78*		*25 - 150*	*11/10/20 06:12*	*11/13/20 01:44*	*1*
13C2 PFDoA	*78*		*25 - 150*	*11/10/20 06:12*	*11/13/20 01:44*	*1*
13C2 PFTeDA	*79*		*25 - 150*	*11/10/20 06:12*	*11/13/20 01:44*	*1*
13C3 PFBS	*81*		*25 - 150*	*11/10/20 06:12*	*11/13/20 01:44*	*1*
18O2 PFHxS	*85*		*25 - 150*	*11/10/20 06:12*	*11/13/20 01:44*	*1*
13C4 PFOS	*84*		*25 - 150*	*11/10/20 06:12*	*11/13/20 01:44*	*1*
d3-NMeFOSAA	*64*		*25 - 150*	*11/10/20 06:12*	*11/13/20 01:44*	*1*
d5-NEtFOSAA	*68*		*25 - 150*	*11/10/20 06:12*	*11/13/20 01:44*	*1*
13C3 HFPO-DA	*77*		*25 - 150*	*11/10/20 06:12*	*11/13/20 01:44*	*1*

Lab Sample ID: LCS 320-430058/2-A
Matrix: Solid
Analysis Batch: 431265

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 430058

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	2.00	2.25		ug/Kg		112	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	2.16		ug/Kg		108	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	2.11		ug/Kg		106	72 - 132
Perfluorononanoic acid (PFNA)	2.00	2.20		ug/Kg		110	73 - 133
Perfluorodecanoic acid (PFDA)	2.00	2.40		ug/Kg		120	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	2.32		ug/Kg		116	66 - 126
Perfluorododecanoic acid (PFDoA)	2.00	2.22		ug/Kg		111	71 - 131
Perfluorotridecanoic acid (PFTriA)	2.00	2.15		ug/Kg		107	71 - 131
Perfluorotetradecanoic acid (PFTeA)	2.00	2.50		ug/Kg		125	67 - 127
Perfluorobutanesulfonic acid (PFBS)	1.77	2.10		ug/Kg		119	69 - 129

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-430058/2-A
Matrix: Solid
Analysis Batch: 431265

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 430058

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.93		ug/Kg		106	62 - 122
Perfluorooctanesulfonic acid (PFOS)	1.86	2.37		ug/Kg		128	68 - 141
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	1.86	2.13		ug/Kg		114	74 - 134
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	2.00	2.27		ug/Kg		114	53 - 158
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	1.88	2.16		ug/Kg		115	66 - 136
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.88	2.25		ug/Kg		119	79 - 139

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*80*		*25 - 150*
13C4 PFHpA	*89*		*25 - 150*
13C4 PFOA	*88*		*25 - 150*
13C5 PFNA	*85*		*25 - 150*
13C2 PFDA	*79*		*25 - 150*
13C2 PFUnA	*78*		*25 - 150*
13C2 PFDoA	*79*		*25 - 150*
13C2 PFTeDA	*77*		*25 - 150*
13C3 PFBS	*77*		*25 - 150*
18O2 PFHxS	*82*		*25 - 150*
13C4 PFOS	*81*		*25 - 150*
d3-NMeFOSAA	*62*		*25 - 150*
d5-NEtFOSAA	*63*		*25 - 150*
13C3 HFPO-DA	*73*		*25 - 150*

Lab Sample ID: 320-66250-1 MS
Matrix: Solid
Analysis Batch: 431265

Client Sample ID: SS-08
Prep Type: Total/NA
Prep Batch: 430058

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	0.58		2.34	3.03		ug/Kg	☼	105	71 - 131
Perfluoroheptanoic acid (PFHpA)	0.18	J	2.34	2.64		ug/Kg	☼	105	71 - 131
Perfluorooctanoic acid (PFOA)	1.0		2.34	3.11		ug/Kg	☼	91	72 - 132
Perfluorononanoic acid (PFNA)	0.77		2.34	3.20		ug/Kg	☼	104	73 - 133
Perfluorodecanoic acid (PFDA)	4.4	F1	2.34	5.79	F1	ug/Kg	☼	58	72 - 132
Perfluoroundecanoic acid (PFUnA)	0.48		2.34	3.17		ug/Kg	☼	115	66 - 126
Perfluorododecanoic acid (PFDoA)	1.4		2.34	3.46		ug/Kg	☼	86	71 - 131
Perfluorotridecanoic acid (PFTriA)	0.36		2.34	2.75		ug/Kg	☼	103	71 - 131
Perfluorotetradecanoic acid (PFTeA)	0.84		2.34	3.17		ug/Kg	☼	100	67 - 127
Perfluorobutanesulfonic acid (PFBS)	0.083	J	2.06	2.48		ug/Kg	☼	116	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	3.7	F1	2.13	4.56	F1	ug/Kg	☼	38	62 - 122

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-66250-1 MS
Matrix: Solid
Analysis Batch: 431265

Client Sample ID: SS-08
Prep Type: Total/NA
Prep Batch: 430058

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	5.8	F1	2.17	7.56		ug/Kg	☼	83	68 - 141
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.18	2.66		ug/Kg	☼	122	74 - 134
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		2.34	2.68		ug/Kg	☼	115	53 - 158
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.20	2.59		ug/Kg	☼	118	66 - 136
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.20	2.60		ug/Kg	☼	118	79 - 139

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C2 PFHxA	*88*		*25 - 150*
13C4 PFHpA	*94*		*25 - 150*
13C4 PFOA	*91*		*25 - 150*
13C5 PFNA	*89*		*25 - 150*
13C2 PFDA	*86*		*25 - 150*
13C2 PFUnA	*87*		*25 - 150*
13C2 PFDoA	*86*		*25 - 150*
13C2 PFTeDA	*85*		*25 - 150*
13C3 PFBS	*75*		*25 - 150*
18O2 PFHxS	*81*		*25 - 150*
13C4 PFOS	*78*		*25 - 150*
d3-NMeFOSAA	*73*		*25 - 150*
d5-NEtFOSAA	*77*		*25 - 150*
13C3 HFPO-DA	*74*		*25 - 150*

Lab Sample ID: 320-66250-1 MSD
Matrix: Solid
Analysis Batch: 431265

Client Sample ID: SS-08
Prep Type: Total/NA
Prep Batch: 430058

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	0.58		2.19	2.82		ug/Kg	☼	102	71 - 131	7	30
Perfluoroheptanoic acid (PFHpA)	0.18	J	2.19	2.55		ug/Kg	☼	108	71 - 131	4	30
Perfluorooctanoic acid (PFOA)	1.0		2.19	2.91		ug/Kg	☼	87	72 - 132	7	30
Perfluorononanoic acid (PFNA)	0.77		2.19	2.82		ug/Kg	☼	94	73 - 133	13	30
Perfluorodecanoic acid (PFDA)	4.4	F1	2.19	5.41	F1	ug/Kg	☼	45	72 - 132	7	30
Perfluoroundecanoic acid (PFUnA)	0.48		2.19	3.13		ug/Kg	☼	121	66 - 126	2	30
Perfluorododecanoic acid (PFDoA)	1.4		2.19	3.28		ug/Kg	☼	84	71 - 131	5	30
Perfluorotridecanoic acid (PFTriA)	0.36		2.19	2.70		ug/Kg	☼	107	71 - 131	2	30
Perfluorotetradecanoic acid (PFTeA)	0.84		2.19	2.94		ug/Kg	☼	96	67 - 127	7	30
Perfluorobutanesulfonic acid (PFBS)	0.083	J	1.94	2.22		ug/Kg	☼	110	69 - 129	11	30
Perfluorohexanesulfonic acid (PFHxS)	3.7	F1	2.00	4.16	F1	ug/Kg	☼	21	62 - 122	9	30
Perfluorooctanesulfonic acid (PFOS)	5.8	F1	2.04	6.80	F1	ug/Kg	☼	51	68 - 141	11	30

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-66250-1 MSD
Matrix: Solid
Analysis Batch: 431265

Client Sample ID: SS-08
Prep Type: Total/NA
Prep Batch: 430058

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.05	2.46		ug/Kg	☼	120	74 - 134	8	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		2.19	2.42		ug/Kg	☼	110	53 - 158	10	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.07	2.37		ug/Kg	☼	114	66 - 136	9	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.07	2.38		ug/Kg	☼	115	79 - 139	9	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C2 PFHxA	*80*		*25 - 150*
13C4 PFHpA	*82*		*25 - 150*
13C4 PFOA	*84*		*25 - 150*
13C5 PFNA	*84*		*25 - 150*
13C2 PFDA	*78*		*25 - 150*
13C2 PFUnA	*74*		*25 - 150*
13C2 PFDoA	*77*		*25 - 150*
13C2 PFTeDA	*82*		*25 - 150*
13C3 PFBS	*70*		*25 - 150*
18O2 PFHxS	*75*		*25 - 150*
13C4 PFOS	*74*		*25 - 150*
d3-NMeFOSAA	*64*		*25 - 150*
d5-NEtFOSAA	*69*		*25 - 150*
13C3 HFPO-DA	*69*		*25 - 150*

Lab Sample ID: MB 320-430059/1-A
Matrix: Solid
Analysis Batch: 431044

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 430059

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.042	ug/Kg		11/10/20 06:18	11/12/20 18:26	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.029	ug/Kg		11/10/20 06:18	11/12/20 18:26	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.086	ug/Kg		11/10/20 06:18	11/12/20 18:26	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.036	ug/Kg		11/10/20 06:18	11/12/20 18:26	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg		11/10/20 06:18	11/12/20 18:26	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036	ug/Kg		11/10/20 06:18	11/12/20 18:26	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.067	ug/Kg		11/10/20 06:18	11/12/20 18:26	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051	ug/Kg		11/10/20 06:18	11/12/20 18:26	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054	ug/Kg		11/10/20 06:18	11/12/20 18:26	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg		11/10/20 06:18	11/12/20 18:26	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.031	ug/Kg		11/10/20 06:18	11/12/20 18:26	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.50	0.20	ug/Kg		11/10/20 06:18	11/12/20 18:26	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg		11/10/20 06:18	11/12/20 18:26	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg		11/10/20 06:18	11/12/20 18:26	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.027	ug/Kg		11/10/20 06:18	11/12/20 18:26	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.25	0.11	ug/Kg		11/10/20 06:18	11/12/20 18:26	1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-430059/1-A
Matrix: Solid
Analysis Batch: 431044

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 430059

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.022	ug/Kg		11/10/20 06:18	11/12/20 18:26	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg		11/10/20 06:18	11/12/20 18:26	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*83*		*25 - 150*	*11/10/20 06:18*	*11/12/20 18:26*	*1*
13C4 PFHpA	*90*		*25 - 150*	*11/10/20 06:18*	*11/12/20 18:26*	*1*
13C4 PFOA	*86*		*25 - 150*	*11/10/20 06:18*	*11/12/20 18:26*	*1*
13C5 PFNA	*81*		*25 - 150*	*11/10/20 06:18*	*11/12/20 18:26*	*1*
13C2 PFDA	*81*		*25 - 150*	*11/10/20 06:18*	*11/12/20 18:26*	*1*
13C2 PFUnA	*81*		*25 - 150*	*11/10/20 06:18*	*11/12/20 18:26*	*1*
13C2 PFDoA	*77*		*25 - 150*	*11/10/20 06:18*	*11/12/20 18:26*	*1*
13C2 PFTeDA	*80*		*25 - 150*	*11/10/20 06:18*	*11/12/20 18:26*	*1*
13C3 PFBS	*83*		*25 - 150*	*11/10/20 06:18*	*11/12/20 18:26*	*1*
18O2 PFHxS	*86*		*25 - 150*	*11/10/20 06:18*	*11/12/20 18:26*	*1*
13C4 PFOS	*82*		*25 - 150*	*11/10/20 06:18*	*11/12/20 18:26*	*1*
d3-NMeFOSAA	*92*		*25 - 150*	*11/10/20 06:18*	*11/12/20 18:26*	*1*
d5-NEtFOSAA	*101*		*25 - 150*	*11/10/20 06:18*	*11/12/20 18:26*	*1*
13C3 HFPO-DA	*81*		*25 - 150*	*11/10/20 06:18*	*11/12/20 18:26*	*1*

Lab Sample ID: LCS 320-430059/2-A
Matrix: Solid
Analysis Batch: 431044

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 430059

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	2.00	2.21		ug/Kg		111	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	2.19		ug/Kg		109	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	2.07		ug/Kg		104	72 - 132
Perfluorononanoic acid (PFNA)	2.00	2.44		ug/Kg		122	73 - 133
Perfluorodecanoic acid (PFDA)	2.00	2.16		ug/Kg		108	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	2.13		ug/Kg		106	66 - 126
Perfluorododecanoic acid (PFDoA)	2.00	2.04		ug/Kg		102	71 - 131
Perfluorotridecanoic acid (PFTriA)	2.00	2.19		ug/Kg		110	71 - 131
Perfluorotetradecanoic acid (PFTeA)	2.00	2.51		ug/Kg		125	67 - 127
Perfluorobutanesulfonic acid (PFBS)	1.77	1.90		ug/Kg		107	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.96		ug/Kg		108	62 - 122
Perfluorooctanesulfonic acid (PFOS)	1.86	2.36		ug/Kg		127	68 - 141
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	1.86	2.18		ug/Kg		117	74 - 134
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	2.00	2.16		ug/Kg		108	53 - 158
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	1.88	2.10		ug/Kg		111	66 - 136

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-430059/2-A
Matrix: Solid
Analysis Batch: 431044

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 430059

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.88	2.20		ug/Kg		117	79 - 139

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*85*		*25 - 150*
13C4 PFHpA	*91*		*25 - 150*
13C4 PFOA	*87*		*25 - 150*
13C5 PFNA	*78*		*25 - 150*
13C2 PFDA	*82*		*25 - 150*
13C2 PFUnA	*79*		*25 - 150*
13C2 PFDoA	*83*		*25 - 150*
13C2 PFTeDA	*73*		*25 - 150*
13C3 PFBS	*83*		*25 - 150*
18O2 PFHxS	*86*		*25 - 150*
13C4 PFOS	*85*		*25 - 150*
d3-NMeFOSAA	*86*		*25 - 150*
d5-NEtFOSAA	*86*		*25 - 150*
13C3 HFPO-DA	*85*		*25 - 150*

Lab Sample ID: 320-66250-10 MS
Matrix: Solid
Analysis Batch: 431044

Client Sample ID: SS-17
Prep Type: Total/NA
Prep Batch: 430059

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	ND		2.15	2.29		ug/Kg	☼	106	71 - 131
Perfluoroheptanoic acid (PFHpA)	ND		2.15	2.54		ug/Kg	☼	118	71 - 131
Perfluorooctanoic acid (PFOA)	ND		2.15	2.28		ug/Kg	☼	106	72 - 132
Perfluorononanoic acid (PFNA)	0.041	J	2.15	2.44		ug/Kg	☼	111	73 - 133
Perfluorodecanoic acid (PFDA)	ND		2.15	2.50		ug/Kg	☼	116	72 - 132
Perfluoroundecanoic acid (PFUnA)	ND		2.15	2.39		ug/Kg	☼	111	66 - 126
Perfluorododecanoic acid (PFDoA)	ND		2.15	2.58		ug/Kg	☼	120	71 - 131
Perfluorotridecanoic acid (PFTriA)	ND		2.15	2.53		ug/Kg	☼	118	71 - 131
Perfluorotetradecanoic acid (PFTeA)	ND		2.15	2.30		ug/Kg	☼	107	67 - 127
Perfluorobutanesulfonic acid (PFBS)	ND		1.90	2.11		ug/Kg	☼	111	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	0.084	J	1.96	2.15		ug/Kg	☼	105	62 - 122
Perfluorooctanesulfonic acid (PFOS)	1.5		2.00	3.99		ug/Kg	☼	123	68 - 141
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.01	2.37		ug/Kg	☼	118	74 - 134
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		2.15	2.31		ug/Kg	☼	107	53 - 158
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.03	2.47		ug/Kg	☼	122	66 - 136
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.03	2.54		ug/Kg	☼	125	79 - 139

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	MS %Recovery	MS Qualifier	Limits
13C2 PFHxA	90		25 - 150
13C4 PFHpA	89		25 - 150
13C4 PFOA	85		25 - 150
13C5 PFNA	85		25 - 150
13C2 PFDA	84		25 - 150
13C2 PFUnA	87		25 - 150
13C2 PFDoA	82		25 - 150
13C2 PFTeDA	83		25 - 150
13C3 PFBS	80		25 - 150
18O2 PFHxS	80		25 - 150
13C4 PFOS	80		25 - 150
d3-NMeFOSAA	82		25 - 150
d5-NEtFOSAA	71		25 - 150
13C3 HFPO-DA	84		25 - 150

Lab Sample ID: 320-66250-10 MSD
Matrix: Solid
Analysis Batch: 431044

Client Sample ID: SS-17
Prep Type: Total/NA
Prep Batch: 430059

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	ND		2.11	2.34		ug/Kg	☼	111	71 - 131	2	30
Perfluoroheptanoic acid (PFHpA)	ND		2.11	2.43		ug/Kg	☼	115	71 - 131	5	30
Perfluorooctanoic acid (PFOA)	ND		2.11	2.19		ug/Kg	☼	104	72 - 132	4	30
Perfluorononanoic acid (PFNA)	0.041	J	2.11	2.32		ug/Kg	☼	108	73 - 133	5	30
Perfluorodecanoic acid (PFDA)	ND		2.11	2.24		ug/Kg	☼	106	72 - 132	11	30
Perfluoroundecanoic acid (PFUnA)	ND		2.11	2.59		ug/Kg	☼	123	66 - 126	8	30
Perfluorododecanoic acid (PFDoA)	ND		2.11	2.12		ug/Kg	☼	101	71 - 131	19	30
Perfluorotridecanoic acid (PFTriA)	ND		2.11	1.98		ug/Kg	☼	94	71 - 131	25	30
Perfluorotetradecanoic acid (PFTeA)	ND		2.11	2.04		ug/Kg	☼	97	67 - 127	12	30
Perfluorobutanesulfonic acid (PFBS)	ND		1.86	2.04		ug/Kg	☼	109	69 - 129	3	30
Perfluorohexanesulfonic acid (PFHxS)	0.084	J	1.92	2.07		ug/Kg	☼	103	62 - 122	4	30
Perfluorooctanesulfonic acid (PFOS)	1.5		1.96	3.98		ug/Kg	☼	126	68 - 141	0	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.97	2.43		ug/Kg	☼	123	74 - 134	2	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		2.11	2.18		ug/Kg	☼	103	53 - 158	6	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.99	2.38		ug/Kg	☼	120	66 - 136	4	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.99	2.56		ug/Kg	☼	129	79 - 139	1	30

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C2 PFHxA	91		25 - 150
13C4 PFHpA	94		25 - 150
13C4 PFOA	89		25 - 150
13C5 PFNA	87		25 - 150
13C2 PFDA	91		25 - 150
13C2 PFUnA	80		25 - 150

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-66250-10 MSD
Matrix: Solid
Analysis Batch: 431044

Client Sample ID: SS-17
Prep Type: Total/NA
Prep Batch: 430059

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C2 PFDoA	93		25 - 150
13C2 PFTeDA	86		25 - 150
13C3 PFBS	83		25 - 150
18O2 PFHxS	85		25 - 150
13C4 PFOS	77		25 - 150
d3-NMeFOSAA	77		25 - 150
d5-NEtFOSAA	73		25 - 150
13C3 HFPO-DA	89		25 - 150

Lab Sample ID: MB 320-430060/1-A
Matrix: Solid
Analysis Batch: 431259

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 430060

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.042	ug/Kg		11/10/20 06:19	11/12/20 22:37	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.029	ug/Kg		11/10/20 06:19	11/12/20 22:37	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.086	ug/Kg		11/10/20 06:19	11/12/20 22:37	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.036	ug/Kg		11/10/20 06:19	11/12/20 22:37	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg		11/10/20 06:19	11/12/20 22:37	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036	ug/Kg		11/10/20 06:19	11/12/20 22:37	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.067	ug/Kg		11/10/20 06:19	11/12/20 22:37	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051	ug/Kg		11/10/20 06:19	11/12/20 22:37	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054	ug/Kg		11/10/20 06:19	11/12/20 22:37	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg		11/10/20 06:19	11/12/20 22:37	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.031	ug/Kg		11/10/20 06:19	11/12/20 22:37	1
Perfluorooctanesulfonic acid (PFOS)	0.239	J	0.50	0.20	ug/Kg		11/10/20 06:19	11/12/20 22:37	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg		11/10/20 06:19	11/12/20 22:37	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg		11/10/20 06:19	11/12/20 22:37	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.027	ug/Kg		11/10/20 06:19	11/12/20 22:37	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.25	0.11	ug/Kg		11/10/20 06:19	11/12/20 22:37	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.022	ug/Kg		11/10/20 06:19	11/12/20 22:37	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg		11/10/20 06:19	11/12/20 22:37	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	87		25 - 150	11/10/20 06:19	11/12/20 22:37	1
13C4 PFHpA	94		25 - 150	11/10/20 06:19	11/12/20 22:37	1
13C4 PFOA	93		25 - 150	11/10/20 06:19	11/12/20 22:37	1
13C5 PFNA	87		25 - 150	11/10/20 06:19	11/12/20 22:37	1
13C2 PFDA	89		25 - 150	11/10/20 06:19	11/12/20 22:37	1
13C2 PFUnA	83		25 - 150	11/10/20 06:19	11/12/20 22:37	1
13C2 PFDoA	85		25 - 150	11/10/20 06:19	11/12/20 22:37	1
13C2 PFTeDA	85		25 - 150	11/10/20 06:19	11/12/20 22:37	1
13C3 PFBS	84		25 - 150	11/10/20 06:19	11/12/20 22:37	1
18O2 PFHxS	90		25 - 150	11/10/20 06:19	11/12/20 22:37	1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-430060/1-A
Matrix: Solid
Analysis Batch: 431259

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 430060

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFOS	89		25 - 150	11/10/20 06:19	11/12/20 22:37	1
d3-NMeFOSAA	66		25 - 150	11/10/20 06:19	11/12/20 22:37	1
d5-NEtFOSAA	67		25 - 150	11/10/20 06:19	11/12/20 22:37	1
13C3 HFPO-DA	82		25 - 150	11/10/20 06:19	11/12/20 22:37	1

Lab Sample ID: LCS 320-430060/2-A
Matrix: Solid
Analysis Batch: 431259

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 430060

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	2.00	2.26		ug/Kg		113	71 - 131
Perfluoroheptanoic acid (PFHpA)	2.00	2.12		ug/Kg		106	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	2.01		ug/Kg		101	72 - 132
Perfluorononanoic acid (PFNA)	2.00	2.28		ug/Kg		114	73 - 133
Perfluorodecanoic acid (PFDA)	2.00	2.37		ug/Kg		119	72 - 132
Perfluoroundecanoic acid (PFUnA)	2.00	2.33		ug/Kg		117	66 - 126
Perfluorododecanoic acid (PFDoA)	2.00	2.22		ug/Kg		111	71 - 131
Perfluorotridecanoic acid (PFTriA)	2.00	2.44		ug/Kg		122	71 - 131
Perfluorotetradecanoic acid (PFTeA)	2.00	2.35		ug/Kg		118	67 - 127
Perfluorobutanesulfonic acid (PFBS)	1.77	2.03		ug/Kg		115	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.93		ug/Kg		106	62 - 122
Perfluorooctanesulfonic acid (PFOS)	1.86	2.19		ug/Kg		118	68 - 141
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	1.86	2.18		ug/Kg		117	74 - 134
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	2.00	2.17		ug/Kg		108	53 - 158
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	1.88	2.19		ug/Kg		116	66 - 136
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.88	2.22		ug/Kg		118	79 - 139

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C2 PFHxA	84		25 - 150
13C4 PFHpA	97		25 - 150
13C4 PFOA	92		25 - 150
13C5 PFNA	87		25 - 150
13C2 PFDA	86		25 - 150
13C2 PFUnA	82		25 - 150
13C2 PFDoA	84		25 - 150
13C2 PFTeDA	85		25 - 150
13C3 PFBS	82		25 - 150
18O2 PFHxS	88		25 - 150
13C4 PFOS	86		25 - 150
d3-NMeFOSAA	66		25 - 150
d5-NEtFOSAA	68		25 - 150

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-430060/2-A
Matrix: Solid
Analysis Batch: 431259

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 430060

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C3 HFPO-DA	80		25 - 150

Lab Sample ID: 320-66250-19 MS
Matrix: Solid
Analysis Batch: 431259

Client Sample ID: SS-26
Prep Type: Total/NA
Prep Batch: 430060

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	ND		2.19	2.46		ug/Kg	☼	112	71 - 131
Perfluoroheptanoic acid (PFHpA)	ND		2.19	2.39		ug/Kg	☼	109	71 - 131
Perfluorooctanoic acid (PFOA)	ND		2.19	2.30		ug/Kg	☼	105	72 - 132
Perfluorononanoic acid (PFNA)	ND		2.19	2.37		ug/Kg	☼	108	73 - 133
Perfluorodecanoic acid (PFDA)	0.066	J	2.19	2.53		ug/Kg	☼	112	72 - 132
Perfluoroundecanoic acid (PFUnA)	ND		2.19	2.54		ug/Kg	☼	116	66 - 126
Perfluorododecanoic acid (PFDoA)	ND		2.19	2.41		ug/Kg	☼	110	71 - 131
Perfluorotridecanoic acid (PFTriA)	ND		2.19	2.43		ug/Kg	☼	111	71 - 131
Perfluorotetradecanoic acid (PFTeA)	ND		2.19	2.64		ug/Kg	☼	120	67 - 127
Perfluorobutanesulfonic acid (PFBS)	ND		1.94	2.21		ug/Kg	☼	114	69 - 129
Perfluorohexanesulfonic acid (PFHxS)	0.037	J	2.00	2.12		ug/Kg	☼	104	62 - 122
Perfluorooctanesulfonic acid (PFOS)	0.72	B	2.04	3.17		ug/Kg	☼	120	68 - 141
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.04	2.53		ug/Kg	☼	124	74 - 134
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		2.19	2.43		ug/Kg	☼	111	53 - 158
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.07	2.44		ug/Kg	☼	118	66 - 136
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.07	2.46		ug/Kg	☼	119	79 - 139

Isotope Dilution	MS %Recovery	MS Qualifier	Limits
13C2 PFHxA	82		25 - 150
13C4 PFHpA	89		25 - 150
13C4 PFOA	88		25 - 150
13C5 PFNA	87		25 - 150
13C2 PFDA	86		25 - 150
13C2 PFUnA	83		25 - 150
13C2 PFDoA	88		25 - 150
13C2 PFTeDA	85		25 - 150
13C3 PFBS	75		25 - 150
18O2 PFHxS	81		25 - 150
13C4 PFOS	78		25 - 150
d3-NMeFOSAA	71		25 - 150
d5-NEtFOSAA	74		25 - 150
13C3 HFPO-DA	74		25 - 150

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 320-66250-19 MSD
Matrix: Solid
Analysis Batch: 431259

Client Sample ID: SS-26
Prep Type: Total/NA
Prep Batch: 430060

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	ND		2.29	2.60		ug/Kg	☼	114	71 - 131	6	30
Perfluoroheptanoic acid (PFHpA)	ND		2.29	2.53		ug/Kg	☼	111	71 - 131	6	30
Perfluorooctanoic acid (PFOA)	ND		2.29	2.31		ug/Kg	☼	101	72 - 132	0	30
Perfluorononanoic acid (PFNA)	ND		2.29	2.44		ug/Kg	☼	107	73 - 133	3	30
Perfluorodecanoic acid (PFDA)	0.066	J	2.29	2.54		ug/Kg	☼	108	72 - 132	0	30
Perfluoroundecanoic acid (PFUnA)	ND		2.29	2.83		ug/Kg	☼	124	66 - 126	11	30
Perfluorododecanoic acid (PFDoA)	ND		2.29	2.63		ug/Kg	☼	115	71 - 131	9	30
Perfluorotridecanoic acid (PFTriA)	ND		2.29	2.63		ug/Kg	☼	115	71 - 131	8	30
Perfluorotetradecanoic acid (PFTeA)	ND		2.29	2.85		ug/Kg	☼	124	67 - 127	8	30
Perfluorobutanesulfonic acid (PFBS)	ND		2.02	2.31		ug/Kg	☼	114	69 - 129	4	30
Perfluorohexanesulfonic acid (PFHxS)	0.037	J	2.08	2.23		ug/Kg	☼	105	62 - 122	5	30
Perfluorooctanesulfonic acid (PFOS)	0.72	B	2.12	3.31		ug/Kg	☼	122	68 - 141	5	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.13	2.53		ug/Kg	☼	119	74 - 134	0	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		2.29	2.53		ug/Kg	☼	110	53 - 158	4	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.15	2.51		ug/Kg	☼	116	66 - 136	3	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.15	2.56		ug/Kg	☼	119	79 - 139	4	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C2 PFHxA	*90*		*25 - 150*
13C4 PFHpA	*93*		*25 - 150*
13C4 PFOA	*96*		*25 - 150*
13C5 PFNA	*90*		*25 - 150*
13C2 PFDA	*92*		*25 - 150*
13C2 PFUnA	*90*		*25 - 150*
13C2 PFDoA	*89*		*25 - 150*
13C2 PFTeDA	*87*		*25 - 150*
13C3 PFBS	*81*		*25 - 150*
18O2 PFHxS	*85*		*25 - 150*
13C4 PFOS	*83*		*25 - 150*
d3-NMeFOSAA	*80*		*25 - 150*
d5-NEtFOSAA	*80*		*25 - 150*
13C3 HFPO-DA	*82*		*25 - 150*

LCMS

Prep Batch: 428478

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66250-28	FB-SS-12	Total/NA	Water	3535	
320-66250-29	EB-SS-12	Total/NA	Water	3535	
320-66250-30	EB-SS-22	Total/NA	Water	3535	
MB 320-428478/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-428478/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-428478/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 429272

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66250-28	FB-SS-12	Total/NA	Water	537 (modified)	428478
320-66250-29	EB-SS-12	Total/NA	Water	537 (modified)	428478
320-66250-30	EB-SS-22	Total/NA	Water	537 (modified)	428478
MB 320-428478/1-A	Method Blank	Total/NA	Water	537 (modified)	428478
LCS 320-428478/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	428478

Analysis Batch: 429793

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 320-428478/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	428478

Prep Batch: 430058

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66250-1	SS-08	Total/NA	Solid	SHAKE	
320-66250-2	SS-09	Total/NA	Solid	SHAKE	
320-66250-3	SS-10	Total/NA	Solid	SHAKE	
320-66250-4	SS-11	Total/NA	Solid	SHAKE	
320-66250-5	SS-12	Total/NA	Solid	SHAKE	
320-66250-6	SS-13	Total/NA	Solid	SHAKE	
320-66250-7	SS-14	Total/NA	Solid	SHAKE	
320-66250-8	SS-15	Total/NA	Solid	SHAKE	
320-66250-9	SS-16	Total/NA	Solid	SHAKE	
MB 320-430058/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-430058/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-66250-1 MS	SS-08	Total/NA	Solid	SHAKE	
320-66250-1 MSD	SS-08	Total/NA	Solid	SHAKE	

Prep Batch: 430059

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66250-10	SS-17	Total/NA	Solid	SHAKE	
320-66250-11	SS-18	Total/NA	Solid	SHAKE	
320-66250-12	SS-19	Total/NA	Solid	SHAKE	
320-66250-13	SS-20	Total/NA	Solid	SHAKE	
320-66250-14	SS-21	Total/NA	Solid	SHAKE	
320-66250-15	SS-22	Total/NA	Solid	SHAKE	
320-66250-16	SS-23	Total/NA	Solid	SHAKE	
320-66250-17	SS-24	Total/NA	Solid	SHAKE	
320-66250-18	SS-25	Total/NA	Solid	SHAKE	
MB 320-430059/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-430059/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-66250-10 MS	SS-17	Total/NA	Solid	SHAKE	
320-66250-10 MSD	SS-17	Total/NA	Solid	SHAKE	

LCMS

Prep Batch: 430060

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66250-19	SS-26	Total/NA	Solid	SHAKE	
320-66250-20	SS-27	Total/NA	Solid	SHAKE	
320-66250-21	SS-28	Total/NA	Solid	SHAKE	
320-66250-22	SS-29	Total/NA	Solid	SHAKE	
320-66250-23	SS-30	Total/NA	Solid	SHAKE	
320-66250-24	SS-31	Total/NA	Solid	SHAKE	
320-66250-25	AKA-SB1-01	Total/NA	Solid	SHAKE	
320-66250-26	AKA-SB1-02	Total/NA	Solid	SHAKE	
320-66250-27	AKA-SB1-12	Total/NA	Solid	SHAKE	
MB 320-430060/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-430060/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-66250-19 MS	SS-26	Total/NA	Solid	SHAKE	
320-66250-19 MSD	SS-26	Total/NA	Solid	SHAKE	

Analysis Batch: 431044

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66250-10	SS-17	Total/NA	Solid	537 (modified)	430059
320-66250-11	SS-18	Total/NA	Solid	537 (modified)	430059
320-66250-12	SS-19	Total/NA	Solid	537 (modified)	430059
320-66250-13	SS-20	Total/NA	Solid	537 (modified)	430059
320-66250-14	SS-21	Total/NA	Solid	537 (modified)	430059
320-66250-15	SS-22	Total/NA	Solid	537 (modified)	430059
320-66250-16	SS-23	Total/NA	Solid	537 (modified)	430059
320-66250-17	SS-24	Total/NA	Solid	537 (modified)	430059
320-66250-18	SS-25	Total/NA	Solid	537 (modified)	430059
MB 320-430059/1-A	Method Blank	Total/NA	Solid	537 (modified)	430059
LCS 320-430059/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	430059
320-66250-10 MS	SS-17	Total/NA	Solid	537 (modified)	430059
320-66250-10 MSD	SS-17	Total/NA	Solid	537 (modified)	430059

Analysis Batch: 431259

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66250-19	SS-26	Total/NA	Solid	537 (modified)	430060
320-66250-20	SS-27	Total/NA	Solid	537 (modified)	430060
320-66250-21	SS-28	Total/NA	Solid	537 (modified)	430060
320-66250-22	SS-29	Total/NA	Solid	537 (modified)	430060
320-66250-23	SS-30	Total/NA	Solid	537 (modified)	430060
320-66250-24	SS-31	Total/NA	Solid	537 (modified)	430060
320-66250-25	AKA-SB1-01	Total/NA	Solid	537 (modified)	430060
320-66250-26	AKA-SB1-02	Total/NA	Solid	537 (modified)	430060
320-66250-27	AKA-SB1-12	Total/NA	Solid	537 (modified)	430060
MB 320-430060/1-A	Method Blank	Total/NA	Solid	537 (modified)	430060
LCS 320-430060/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	430060
320-66250-19 MS	SS-26	Total/NA	Solid	537 (modified)	430060
320-66250-19 MSD	SS-26	Total/NA	Solid	537 (modified)	430060

Analysis Batch: 431265

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66250-1	SS-08	Total/NA	Solid	537 (modified)	430058
320-66250-2	SS-09	Total/NA	Solid	537 (modified)	430058
320-66250-3	SS-10	Total/NA	Solid	537 (modified)	430058

LCMS (Continued)

Analysis Batch: 431265 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66250-4	SS-11	Total/NA	Solid	537 (modified)	430058
320-66250-5	SS-12	Total/NA	Solid	537 (modified)	430058
320-66250-6	SS-13	Total/NA	Solid	537 (modified)	430058
320-66250-7	SS-14	Total/NA	Solid	537 (modified)	430058
320-66250-8	SS-15	Total/NA	Solid	537 (modified)	430058
320-66250-9	SS-16	Total/NA	Solid	537 (modified)	430058
MB 320-430058/1-A	Method Blank	Total/NA	Solid	537 (modified)	430058
LCS 320-430058/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	430058
320-66250-1 MS	SS-08	Total/NA	Solid	537 (modified)	430058
320-66250-1 MSD	SS-08	Total/NA	Solid	537 (modified)	430058

General Chemistry

Analysis Batch: 428849

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66250-1	SS-08	Total/NA	Solid	D 2216	
320-66250-2	SS-09	Total/NA	Solid	D 2216	
320-66250-3	SS-10	Total/NA	Solid	D 2216	
320-66250-4	SS-11	Total/NA	Solid	D 2216	
320-66250-5	SS-12	Total/NA	Solid	D 2216	
320-66250-6	SS-13	Total/NA	Solid	D 2216	
320-66250-7	SS-14	Total/NA	Solid	D 2216	
320-66250-8	SS-15	Total/NA	Solid	D 2216	
320-66250-9	SS-16	Total/NA	Solid	D 2216	
320-66250-10	SS-17	Total/NA	Solid	D 2216	
320-66250-11	SS-18	Total/NA	Solid	D 2216	
320-66250-12	SS-19	Total/NA	Solid	D 2216	
320-66250-13	SS-20	Total/NA	Solid	D 2216	
320-66250-14	SS-21	Total/NA	Solid	D 2216	
320-66250-15	SS-22	Total/NA	Solid	D 2216	
320-66250-16	SS-23	Total/NA	Solid	D 2216	
320-66250-17	SS-24	Total/NA	Solid	D 2216	
320-66250-18	SS-25	Total/NA	Solid	D 2216	
320-66250-19	SS-26	Total/NA	Solid	D 2216	
320-66250-1 DU	SS-08	Total/NA	Solid	D 2216	

Analysis Batch: 428879

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66250-20	SS-27	Total/NA	Solid	D 2216	
320-66250-21	SS-28	Total/NA	Solid	D 2216	
320-66250-22	SS-29	Total/NA	Solid	D 2216	
320-66250-23	SS-30	Total/NA	Solid	D 2216	
320-66250-24	SS-31	Total/NA	Solid	D 2216	
320-66250-25	AKA-SB1-01	Total/NA	Solid	D 2216	
320-66250-26	AKA-SB1-02	Total/NA	Solid	D 2216	
320-66250-27	AKA-SB1-12	Total/NA	Solid	D 2216	
320-66250-20 DU	SS-27	Total/NA	Solid	D 2216	

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-08
Date Collected: 10/29/20 12:30
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-1
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			428849	11/05/20 14:49	TCS	TAL SAC

Client Sample ID: SS-08
Date Collected: 10/29/20 12:30
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-1
Matrix: Solid
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			5.07 g	10.00 mL	430058	11/10/20 06:12	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431265	11/13/20 02:22	JY1	TAL SAC

Client Sample ID: SS-09
Date Collected: 10/29/20 13:00
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-2
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			428849	11/05/20 14:49	TCS	TAL SAC

Client Sample ID: SS-09
Date Collected: 10/29/20 13:00
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-2
Matrix: Solid
Percent Solids: 89.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.13 g	10.00 mL	430058	11/10/20 06:12	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431265	11/13/20 02:50	JY1	TAL SAC

Client Sample ID: SS-10
Date Collected: 10/29/20 20:30
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-3
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			428849	11/05/20 14:49	TCS	TAL SAC

Client Sample ID: SS-10
Date Collected: 10/29/20 20:30
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-3
Matrix: Solid
Percent Solids: 93.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.40 g	10.00 mL	430058	11/10/20 06:12	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431265	11/13/20 02:59	JY1	TAL SAC

Client Sample ID: SS-11
Date Collected: 10/29/20 20:35
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-4
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			428849	11/05/20 14:49	TCS	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-11
Date Collected: 10/29/20 20:35
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-4
Matrix: Solid
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			5.37 g	10.00 mL	430058	11/10/20 06:12	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431265	11/13/20 03:09	JY1	TAL SAC

Client Sample ID: SS-12
Date Collected: 10/29/20 21:00
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-5
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			428849	11/05/20 14:49	TCS	TAL SAC

Client Sample ID: SS-12
Date Collected: 10/29/20 21:00
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-5
Matrix: Solid
Percent Solids: 92.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.27 g	10.00 mL	430058	11/10/20 06:12	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431265	11/13/20 03:37	JY1	TAL SAC

Client Sample ID: SS-13
Date Collected: 10/29/20 15:35
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-6
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			428849	11/05/20 14:49	TCS	TAL SAC

Client Sample ID: SS-13
Date Collected: 10/29/20 15:35
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-6
Matrix: Solid
Percent Solids: 82.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.11 g	10.00 mL	430058	11/10/20 06:12	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431265	11/13/20 03:46	JY1	TAL SAC

Client Sample ID: SS-14
Date Collected: 10/29/20 16:05
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-7
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			428849	11/05/20 14:49	TCS	TAL SAC

Client Sample ID: SS-14
Lab Sample ID: 320-66250-7
Date Collected: 10/29/20 16:05
Matrix: Solid
Date Received: 11/03/20 12:10
Percent Solids: 88.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.18 g	10.00 mL	430058	11/10/20 06:12	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431265	11/13/20 03:55	JY1	TAL SAC

Client Sample ID: SS-15
Lab Sample ID: 320-66250-8
Date Collected: 10/29/20 16:25
Matrix: Solid
Date Received: 11/03/20 12:10

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			428849	11/05/20 14:49	TCS	TAL SAC

Client Sample ID: SS-15
Lab Sample ID: 320-66250-8
Date Collected: 10/29/20 16:25
Matrix: Solid
Date Received: 11/03/20 12:10
Percent Solids: 85.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.20 g	10.00 mL	430058	11/10/20 06:12	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431265	11/13/20 04:05	JY1	TAL SAC

Client Sample ID: SS-16
Lab Sample ID: 320-66250-9
Date Collected: 10/29/20 16:50
Matrix: Solid
Date Received: 11/03/20 12:10

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			428849	11/05/20 14:49	TCS	TAL SAC

Client Sample ID: SS-16
Lab Sample ID: 320-66250-9
Date Collected: 10/29/20 16:50
Matrix: Solid
Date Received: 11/03/20 12:10
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			5.35 g	10.00 mL	430058	11/10/20 06:12	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431265	11/13/20 04:14	JY1	TAL SAC

Client Sample ID: SS-17
Lab Sample ID: 320-66250-10
Date Collected: 10/29/20 19:55
Matrix: Solid
Date Received: 11/03/20 12:10

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			428849	11/05/20 14:49	TCS	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-17
Date Collected: 10/29/20 19:55
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-10
Matrix: Solid
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			5.38 g	10.00 mL	430059	11/10/20 06:18	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431044	11/12/20 19:03	K1S	TAL SAC

Client Sample ID: SS-18
Date Collected: 10/30/20 14:35
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-11
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			428849	11/05/20 14:49	TCS	TAL SAC

Client Sample ID: SS-18
Date Collected: 10/30/20 14:35
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-11
Matrix: Solid
Percent Solids: 90.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.44 g	10.00 mL	430059	11/10/20 06:18	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431044	11/12/20 19:32	K1S	TAL SAC

Client Sample ID: SS-19
Date Collected: 10/30/20 15:55
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-12
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			428849	11/05/20 14:49	TCS	TAL SAC

Client Sample ID: SS-19
Date Collected: 10/30/20 15:55
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-12
Matrix: Solid
Percent Solids: 90.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.20 g	10.00 mL	430059	11/10/20 06:18	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431044	11/12/20 19:41	K1S	TAL SAC

Client Sample ID: SS-20
Date Collected: 10/30/20 16:05
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-13
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			428849	11/05/20 14:49	TCS	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-20
Lab Sample ID: 320-66250-13
Date Collected: 10/30/20 16:05
Matrix: Solid
Date Received: 11/03/20 12:10
Percent Solids: 86.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.50 g	10.00 mL	430059	11/10/20 06:18	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431044	11/12/20 19:50	K1S	TAL SAC

Client Sample ID: SS-21
Lab Sample ID: 320-66250-14
Date Collected: 10/30/20 16:20
Matrix: Solid
Date Received: 11/03/20 12:10

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			428849	11/05/20 14:49	TCS	TAL SAC

Client Sample ID: SS-21
Lab Sample ID: 320-66250-14
Date Collected: 10/30/20 16:20
Matrix: Solid
Date Received: 11/03/20 12:10
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			5.38 g	10.00 mL	430059	11/10/20 06:18	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431044	11/12/20 20:19	K1S	TAL SAC

Client Sample ID: SS-22
Lab Sample ID: 320-66250-15
Date Collected: 10/30/20 21:45
Matrix: Solid
Date Received: 11/03/20 12:10

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			428849	11/05/20 14:49	TCS	TAL SAC

Client Sample ID: SS-22
Lab Sample ID: 320-66250-15
Date Collected: 10/30/20 21:45
Matrix: Solid
Date Received: 11/03/20 12:10
Percent Solids: 92.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.15 g	10.00 mL	430059	11/10/20 06:18	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431044	11/12/20 20:28	K1S	TAL SAC

Client Sample ID: SS-23
Lab Sample ID: 320-66250-16
Date Collected: 10/30/20 21:35
Matrix: Solid
Date Received: 11/03/20 12:10

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			428849	11/05/20 14:49	TCS	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-23
Lab Sample ID: 320-66250-16
Date Collected: 10/30/20 21:35
Matrix: Solid
Date Received: 11/03/20 12:10
Percent Solids: 68.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.32 g	10.00 mL	430059	11/10/20 06:18	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431044	11/12/20 20:37	K1S	TAL SAC

Client Sample ID: SS-24
Lab Sample ID: 320-66250-17
Date Collected: 10/30/20 17:10
Matrix: Solid
Date Received: 11/03/20 12:10

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			428849	11/05/20 14:49	TCS	TAL SAC

Client Sample ID: SS-24
Lab Sample ID: 320-66250-17
Date Collected: 10/30/20 17:10
Matrix: Solid
Date Received: 11/03/20 12:10
Percent Solids: 75.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.23 g	10.00 mL	430059	11/10/20 06:18	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431044	11/12/20 20:47	K1S	TAL SAC

Client Sample ID: SS-25
Lab Sample ID: 320-66250-18
Date Collected: 10/30/20 17:25
Matrix: Solid
Date Received: 11/03/20 12:10

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			428849	11/05/20 14:49	TCS	TAL SAC

Client Sample ID: SS-25
Lab Sample ID: 320-66250-18
Date Collected: 10/30/20 17:25
Matrix: Solid
Date Received: 11/03/20 12:10
Percent Solids: 83.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.06 g	10.00 mL	430059	11/10/20 06:18	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431044	11/12/20 20:56	K1S	TAL SAC

Client Sample ID: SS-26
Lab Sample ID: 320-66250-19
Date Collected: 10/30/20 17:55
Matrix: Solid
Date Received: 11/03/20 12:10

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			428849	11/05/20 14:49	TCS	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-26
Lab Sample ID: 320-66250-19
Date Collected: 10/30/20 17:55
Matrix: Solid
Date Received: 11/03/20 12:10
Percent Solids: 84.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.38 g	10.00 mL	430060	11/10/20 06:19	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431259	11/12/20 23:15	D1R	TAL SAC

Client Sample ID: SS-27
Lab Sample ID: 320-66250-20
Date Collected: 10/30/20 18:00
Matrix: Solid
Date Received: 11/03/20 12:10

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			428879	11/05/20 15:48	TCS	TAL SAC

Client Sample ID: SS-27
Lab Sample ID: 320-66250-20
Date Collected: 10/30/20 18:00
Matrix: Solid
Date Received: 11/03/20 12:10
Percent Solids: 86.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.32 g	10.00 mL	430060	11/10/20 06:19	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431259	11/12/20 23:43	D1R	TAL SAC

Client Sample ID: SS-28
Lab Sample ID: 320-66250-21
Date Collected: 10/30/20 17:45
Matrix: Solid
Date Received: 11/03/20 12:10

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			428879	11/05/20 15:48	TCS	TAL SAC

Client Sample ID: SS-28
Lab Sample ID: 320-66250-21
Date Collected: 10/30/20 17:45
Matrix: Solid
Date Received: 11/03/20 12:10
Percent Solids: 84.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.29 g	10.00 mL	430060	11/10/20 06:19	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431259	11/12/20 23:52	D1R	TAL SAC

Client Sample ID: SS-29
Lab Sample ID: 320-66250-22
Date Collected: 10/30/20 18:10
Matrix: Solid
Date Received: 11/03/20 12:10

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			428879	11/05/20 15:48	TCS	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: SS-29
Lab Sample ID: 320-66250-22
Date Collected: 10/30/20 18:10
Matrix: Solid
Date Received: 11/03/20 12:10
Percent Solids: 80.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.28 g	10.00 mL	430060	11/10/20 06:19	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431259	11/13/20 00:02	D1R	TAL SAC

Client Sample ID: SS-30
Lab Sample ID: 320-66250-23
Date Collected: 10/30/20 21:00
Matrix: Solid
Date Received: 11/03/20 12:10

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			428879	11/05/20 15:48	TCS	TAL SAC

Client Sample ID: SS-30
Lab Sample ID: 320-66250-23
Date Collected: 10/30/20 21:00
Matrix: Solid
Date Received: 11/03/20 12:10
Percent Solids: 88.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.20 g	10.00 mL	430060	11/10/20 06:19	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431259	11/13/20 00:30	D1R	TAL SAC

Client Sample ID: SS-31
Lab Sample ID: 320-66250-24
Date Collected: 10/30/20 21:10
Matrix: Solid
Date Received: 11/03/20 12:10

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			428879	11/05/20 15:48	TCS	TAL SAC

Client Sample ID: SS-31
Lab Sample ID: 320-66250-24
Date Collected: 10/30/20 21:10
Matrix: Solid
Date Received: 11/03/20 12:10
Percent Solids: 86.0

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	10.00 mL	430060	11/10/20 06:19	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431259	11/13/20 00:39	D1R	TAL SAC

Client Sample ID: AKA-SB1-01
Lab Sample ID: 320-66250-25
Date Collected: 10/27/20 18:00
Matrix: Solid
Date Received: 11/03/20 12:10

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			428879	11/05/20 15:48	TCS	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: AKA-SB1-01
Date Collected: 10/27/20 18:00
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-25
Matrix: Solid
Percent Solids: 93.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.33 g	10.00 mL	430060	11/10/20 06:19	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431259	11/13/20 00:48	D1R	TAL SAC

Client Sample ID: AKA-SB1-02
Date Collected: 10/27/20 18:15
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-26
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			428879	11/05/20 15:48	TCS	TAL SAC

Client Sample ID: AKA-SB1-02
Date Collected: 10/27/20 18:15
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-26
Matrix: Solid
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			5.42 g	10.00 mL	430060	11/10/20 06:19	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431259	11/13/20 00:58	D1R	TAL SAC

Client Sample ID: AKA-SB1-12
Date Collected: 10/27/20 18:05
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-27
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			428879	11/05/20 15:48	TCS	TAL SAC

Client Sample ID: AKA-SB1-12
Date Collected: 10/27/20 18:05
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-27
Matrix: Solid
Percent Solids: 88.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.23 g	10.00 mL	430060	11/10/20 06:19	MA	TAL SAC
Total/NA	Analysis	537 (modified)		1			431259	11/13/20 01:07	D1R	TAL SAC

Client Sample ID: FB-SS-12
Date Collected: 10/29/20 21:00
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66250-28
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			280.8 mL	10.00 mL	428478	11/04/20 20:28	VP	TAL SAC
Total/NA	Analysis	537 (modified)		1			429272	11/07/20 07:32	K1S	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Client Sample ID: EB-SS-12

Lab Sample ID: 320-66250-29

Date Collected: 10/29/20 21:15

Matrix: Water

Date Received: 11/03/20 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			263 mL	10.00 mL	428478	11/04/20 20:28	VP	TAL SAC
Total/NA	Analysis	537 (modified)		1			429272	11/07/20 07:41	K1S	TAL SAC

Client Sample ID: EB-SS-22

Lab Sample ID: 320-66250-30

Date Collected: 10/30/20 22:00

Matrix: Water

Date Received: 11/03/20 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			255.9 mL	10.00 mL	428478	11/04/20 20:28	VP	TAL SAC
Total/NA	Analysis	537 (modified)		1			429272	11/07/20 07:50	K1S	TAL SAC

Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Laboratory: Eurofins TestAmerica, Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	01-20-21
ANAB	Dept. of Defense ELAP	L2468	01-20-21
ANAB	Dept. of Energy	L2468.01	01-20-21
ANAB	ISO/IEC 17025	L2468	01-20-21
Arizona	State	AZ0708	08-11-21
Arkansas DEQ	State	88-0691	06-17-21
California	State	2897	01-31-22
Colorado	State	CA0004	08-31-21
Connecticut	State	PH-0691	06-30-21
Florida	NELAP	E87570	06-30-21
Georgia	State	4040	01-30-21
Hawaii	State	<cert No.>	01-29-21
Illinois	NELAP	200060	03-17-21
Kansas	NELAP	E-10375	10-31-20 *
Louisiana	NELAP	01944	06-30-21
Maine	State	CA00004	04-14-22
Michigan	State	9947	08-03-23
Nevada	State	CA000442021-1	07-31-21
New Hampshire	NELAP	2997	04-18-21
New Jersey	NELAP	CA005	06-30-21
New York	NELAP	11666	04-01-21
Oregon	NELAP	4040	01-29-21
Pennsylvania	NELAP	68-01272	03-31-21
Texas	NELAP	T104704399-19-13	06-01-21
US Fish & Wildlife	US Federal Programs	58448	07-31-21
USDA	US Federal Programs	P330-18-00239	07-31-21
Utah	NELAP	CA000442019-01	02-28-21
Vermont	State	VT-4040	04-16-21
Virginia	NELAP	460278	03-14-21
Washington	State	C581	05-05-21
West Virginia (DW)	State	9930C	12-31-20
Wisconsin	State	998204680	08-31-21
Wyoming	State Program	8TMS-L	01-28-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

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 TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66250-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
320-66250-1	SS-08	Solid	10/29/20 12:30	11/03/20 12:10	
320-66250-2	SS-09	Solid	10/29/20 13:00	11/03/20 12:10	
320-66250-3	SS-10	Solid	10/29/20 20:30	11/03/20 12:10	
320-66250-4	SS-11	Solid	10/29/20 20:35	11/03/20 12:10	
320-66250-5	SS-12	Solid	10/29/20 21:00	11/03/20 12:10	
320-66250-6	SS-13	Solid	10/29/20 15:35	11/03/20 12:10	
320-66250-7	SS-14	Solid	10/29/20 16:05	11/03/20 12:10	
320-66250-8	SS-15	Solid	10/29/20 16:25	11/03/20 12:10	
320-66250-9	SS-16	Solid	10/29/20 16:50	11/03/20 12:10	
320-66250-10	SS-17	Solid	10/29/20 19:55	11/03/20 12:10	
320-66250-11	SS-18	Solid	10/30/20 14:35	11/03/20 12:10	
320-66250-12	SS-19	Solid	10/30/20 15:55	11/03/20 12:10	
320-66250-13	SS-20	Solid	10/30/20 16:05	11/03/20 12:10	
320-66250-14	SS-21	Solid	10/30/20 16:20	11/03/20 12:10	
320-66250-15	SS-22	Solid	10/30/20 21:45	11/03/20 12:10	
320-66250-16	SS-23	Solid	10/30/20 21:35	11/03/20 12:10	
320-66250-17	SS-24	Solid	10/30/20 17:10	11/03/20 12:10	
320-66250-18	SS-25	Solid	10/30/20 17:25	11/03/20 12:10	
320-66250-19	SS-26	Solid	10/30/20 17:55	11/03/20 12:10	
320-66250-20	SS-27	Solid	10/30/20 18:00	11/03/20 12:10	
320-66250-21	SS-28	Solid	10/30/20 17:45	11/03/20 12:10	
320-66250-22	SS-29	Solid	10/30/20 18:10	11/03/20 12:10	
320-66250-23	SS-30	Solid	10/30/20 21:00	11/03/20 12:10	
320-66250-24	SS-31	Solid	10/30/20 21:10	11/03/20 12:10	
320-66250-25	AKA-SB1-01	Solid	10/27/20 18:00	11/03/20 12:10	
320-66250-26	AKA-SB1-02	Solid	10/27/20 18:15	11/03/20 12:10	
320-66250-27	AKA-SB1-12	Solid	10/27/20 18:05	11/03/20 12:10	
320-66250-28	FB-SS-12	Water	10/29/20 21:00	11/03/20 12:10	
320-66250-29	EB-SS-12	Water	10/29/20 21:15	11/03/20 12:10	
320-66250-30	EB-SS-22	Water	10/30/20 22:00	11/03/20 12:10	

CHAIN-OF-CUSTODY RECORD

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600
www.shannonwilson.com

Page 1 of 3

Laboratory Test America / Eurofins
Attn: David Althaeke

Turn Around Time: [X] Normal [ ] Rush — Please Specify

Quote No: —

J-Flags: [X] Yes [ ] No

Analytical Methods (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	PFAS +18 LBP (537.1 Mod)	Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
SS-08		12:30	10/29/20	X	1	Soil
SS-09		13:00		X		
SS-10		20:30		X		
SS-11		20:35		X		
SS-12		21:00		X		
SS-13		15:35		X		
SS-14		16:05		X		
SS-15		16:25		X		
SS-16		16:50		X		
SS-17		19:55		X		

320-66250 Chain of Custody

Project Information	
Number:	105745
Name:	Nome DOT&PF
Contact:	MDN
Ongoing Project?	Yes [X] No [ ]
Sampler:	MDN / APW / VTY

Sample Receipt	
Total No. of Containers:	
COC Seals/Intact? Y/N/NA	
Received Good Cond./Cold	
Temp:	
Delivery Method:	Goldstreak

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: M. Nadel Time: 1300	Signature: Time:	Signature: Time:
Printed Name: Marcy Nadel Date: 11/1/20	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 1210	Signature: Time:	Signature: Time:
Printed Name: David Hu Date: 11/2/20	Printed Name: Date:	Printed Name: Date:
Company: ETA	Company:	Company:

Notes:

Please bill to 105745-002

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

30c

No. 411593

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600
www.shannonwilson.com

CHAIN-OF-CUSTODY RECORD

Page
Laboratory Test America
Attn: David Althoff

Turn Around Time: [X] Normal [ ] Rush — Please Specify

Quote No: —

J-Flags: [X] Yes [ ] No

Analytical Methods (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	PFAS 18 (537.1M 1.1)	Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
SS-18		1435	10/30/20	X	1	Soil
SS-19		1555		X		
SS-20		16:05		X		
SS-21		16:20		X		
SS-22		2135		X		
SS-23		2135		X		
SS-24		1710		X		
SS-25		17:25		X		
SS-26		17:55		X		
SS-27		1800		X		

Project Information	
Number:	
Name:	
Contact:	
Ongoing Project? Yes [ ] No [ ]	
Sampler:	

Sample Receipt	
Total No. of Containers:	
COC Seals/Intact? Y/N/NA	
Received Good Cond/Cold	
Temp:	
Delivery Method:	

Notes: See

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Marcy Nadel Time: 1300	Signature: Time:	Signature: Time:
Printed Name: Marcy Nadel Date: 11/1/20	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson, Inc.	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 1210	Signature: Time:	Signature: Time:
Printed Name: David Hu Date: 11/2/20	Printed Name: Date:	Printed Name: Date:
Company: ETA SV	Company:	Company:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

No. 411594

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN-OF-CUSTODY RECORD

Laboratory Test Am/Eurofins
Attn: David Allhuckey

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2043 Westport Center Drive
St. Louis, MO 63146-3564
(314) 699-9660

303 Wellsian Way
Richland, WA 99352
(509) 946-6309

3355 Hill Road
Fairbanks, AK 99709
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

2265 S.W. Canyon Road
Portland, OR 97201-2498
(503) 223-6147

1200 17th Street, Suite 1024
Denver, Co 80202
(303) 825-3800

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	PFAS +18 (EPA 537.1 LSI)						Total Number of Containers	Remarks/Matrix
SS-28		17:45	10/30/20		X	X						1	Soil
SS-29		18:10			X	X							
SS-30		2100			X	X							
SS-31		21:10			X	X							
AKA-SB1-01		1800	10/27/20		X	X							
AKA-SB1-02		1815			X	X							
AKA-SB1-12		1805			X	X							
FB-SS-12		21:00	10/29/20	—		X							Field blk
EB-SS-12		21:15	10/29/20	—		X							Equiptment blk
EB-SS-22		22:00	10/30/20	—		X							~~Field blk~~

Project Information	Sample Receipt
Project Number:	Total Number of Containers:
Project Name:	COC Seals/Intact? Y/N/NA
Contact:	Received Good Cond./Cold
Ongoing Project? Yes ☐ No ☐	Delivery Method:
Sampler:	(attach shipping bill, if any)

Instructions
Requested Turnaround Time:
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Marcy Nadel Time: 1300	Signature: Time:	Signature: Time:
Printed Name: Marcy Nadel Date: 11/1/20	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 12:16	Signature: Time:	Signature: Time:
Printed Name: Date: 11/3/20	Printed Name: Date:	Printed Name: Date:
Company: ETTS	Company:	Company:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

F-19-91/UR

30C

No. ~~30000~~

Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 320-66250-1

Login Number: 66250
List Number: 1
Creator: Her, David A

List Source: Eurofins TestAmerica, Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	SEALS
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 <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Laboratory Data Review Checklist

Completed By:

Veselina Yakimova

Title:

Geologist

Date:

November 20, 2020

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

Eurofins / TestAmerica Laboratories, Inc.

Laboratory Report Number:

320-66250-1

Laboratory Report Date:

November 16, 2020

CS Site Name:

Nome Airport Statewide PFAS

ADEC File Number:

400.38.056

Hazard Identification Number:

27154

320-66250-1

Laboratory Report Date:

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☒ No☐ N/A☐ Comments:

   The DEC certified TestAmerica of West Sacramento, CA for the analysis of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) on February 6, 2018 by method 537. These compounds were included in the DEC's Contaminated Sites Laboratory Approval 17-020.

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☐ No☐ N/A☒ Comments:

   The requested analyses were conducted by TestAmerica Laboratories in West Sacramento, CA.

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:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☐ No☐ N/A☒ Comments:

   PFAS samples do not require preservation other than temperature control.

   c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

   Yes☒ No☐ N/A☐ Comments:

   The sample receipt form notes that the samples arrived in good condition.

Laboratory Report Date:

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:

No discrepancies were noted by the laboratory in the sample receipt documentation.

e. Data quality or usability affected?

Comments:

The data quality and/or usability was not affected; see above.

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

Laboratory Report Date:

b. Discrepancies, errors, or QC failures identified by the lab?

Yes☒ No☐ N/A☐ Comments:

The laboratory applied the "I" qualifier to the PFHxS result of sample *SS-20,* PFDA result of sample *SS-23,* and PFHxA result of sample *AKA-SB1-01* to indicate that the transition mass ratio was outside of the established ratio limits. The qualitative identification of the analytes has some degree of uncertainty and analyst judgment was used to positively identify the analytes. These results have been flagged with a 'J' in the analytical database.

The concentration of PFOS associated with samples *SS-13, AKA-SB1-02,* and *AKA-SB1-12* 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. These results have been flagged with a 'J' in the analytical database.

The matrix spike (MS) recoveries for preparation batch 430058 were outside control limits for PFHxS and PFDA. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

The matrix spike duplicate (MSD) recoveries for preparation batch 430058 were outside control limits for several analytes. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Insufficient sample volume was available to perform a MS/MSD associated with preparation batch 428478.

The following samples were yellow and cloudy after final volume/extraction: *SS-10, SS-11* and *SS-12*.

The following samples were yellow after final volume/extraction: *SS-18, SS-20, SS-23* and *SS-24*.

Sample *SS-25* was cloudy after final volume/extraction.

Samples *SS-28, SS-29,* and *SS-30* were yellow after 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:

Yes, see above.

320-66250-1

Laboratory Report Date:

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 reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☒ No☐ N/A☐ Comments:

The reporting limit (RL) is less than the applicable DEC regulatory limits for the project.

e. Data quality or usability affected?

The data quality and/or usability was not affected; see above.

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 limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

There were no detections above LOQ in the method blank; however, PFOS was detected below the LOQ in the method blank associated with preparation batch 430060.

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

Samples *SS-26, SS-27, SS-28, SS-29, SS-30, SS-31, AKA-SB1-01, AKA-SB1-02*, and *AKA-SB1-12* are included in preparation batch 430060. Of the included samples, only *SS-26, SS-27, SS-28, SS-29,* and *SS-31* contained PFOS concentrations within ten times that of the concentration detected in the method blank. Sample *SS-30* had no analyte detections.

Laboratory Report Date:

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

The PFOS results of the samples *SS-26, SS-27, SS-28, SS-29,* and *SS-31* are considered to be impacted by external contamination and have been flagged 'UB' at the LOQ or detected concentration (whichever is greater) in the analytical tables.

v. Data quality or usability affected?

Comments:

The data quality/usability is affected. See above.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes☒ No☐ N/A☐ Comments:

An LCS was reported for each of the soil preparatory batches (430058, 430059, and 430060).

An LCS/LCSD pair was reported for the water preparatory batch (428478).

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

Metals and/or inorganics were not analyzed as part of this work order.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

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. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

LCSDs were not reported for the soil batches. Refer to MS/MSD results for assessment of method precision.

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

NA; method accuracy was demonstrated to be within acceptable limits.

Laboratory Report Date:

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

Qualification of the data was not required; see above.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and/or usability was not affected; see above.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☐ No☒ N/A☐ Comments:

An MS/MSD pair was reported for each of the soil preparatory batches.

Insufficient sample volume was available to perform a MS/MSD associated with the water preparation batch 428478.

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

Metals and/or inorganics were not analyzed as part of 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 recovery of PFDA and PFHxS were below their lower control limits in the MS sample associated with preparation batch 430058.

The recoveries of PFDA, PFHxS and PFOS were below their lower control limits in the MSD samples associated with preparation batch 430058.

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:

Sample *SS-08* was used as a parent sample for the MS/MSD reported in preparation batch 430058.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

The spiking concentrations added to the matrix were low relative to the native concentrations in the parent sample. The uncertainty introduced into the recovery calculations may render the MS/MSD results unrepresentative of actual method performance. Results are not affected by the MS/MSD failures.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and/or usability was not 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:

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:

There were no IDA recovery failures associated with this work order.

iv. Data quality or usability affected?

Comments:

The data quality and/or usability was 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. A trip blank is not required for the requested analysis.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes☐ No☐ N/A☒ Comments:

A trip blank is not required for the requested analysis.

iii. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

A trip blank is not required for the requested analysis.

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

NA; a trip blank is not required for the requested analysis.

v. Data quality or usability affected?

Comments:

The data quality and/or usability was not affected; see above.

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☒ No☐ N/A☐ Comments:

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

The field duplicate pairs *AKA-SB1-02 / AKA-SB1-12, SS-10 / SS-11,* and *SS-26 / SS-27* were submitted with this work order.

iii. Precision – All relative percent differences (RPD) less than specified project objectives? (Recommended: 30% water, 50% soil)

RPD (%) = 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:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

The data quality and/or usability was not affected; see above.

Laboratory Report Date:

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☒ No☐ N/A☐ Comments:

Field blank *FB-SS-12* and equipment blanks *EB-SS-12* and *EB-SS-22* were submitted with this work order.

i. All results less than LOQ and project specified objectives?

Yes☒ No☐ N/A☐ Comments:

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

No analytes were detected in the equipment blank.

iii. Data quality or usability affected?

Comments:

No; see above.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes☐ No☐ N/A☒ Comments:

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

Laboratory Job ID: 320-66252-1
Client Project/Site: Nome DOT&PF

For:
Shannon & Wilson, Inc
2355 Hill Rd.
Fairbanks, Alaska 99709-5244

Attn: Marcy Nadel

Authorized for release by:
11/12/2020 9:45:43 AM

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Definitions/Glossary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

Qualifiers

LCMS

Qualifier	Qualifier Description
*1	LCS/LCSD RPD exceeds control limits.
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.
¤	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

Job ID: 320-66252-1

Laboratory: Eurofins TestAmerica, Sacramento

Narrative

Job Narrative
320-66252-1

Receipt
The samples were received on 11/3/2020 12:10 PM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.2º C.

LCMS
Method 537 (modified): The RPD of the laboratory control sample duplicate (LCSD) for preparation batch 320-428802 and analytical batch 320-429387 recovered outside control limits for the following analytes: Perfluorotetradecanoic acid (PFTeA).

Method 537 (modified): Results for samples AKA-TWP-01 (320-66252-6) were reported from the analysis of a diluted extract due to high concentration and matrix interference 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

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method 3535: The following samples ANG-TWP-02 (320-66252-1), ANG-TWP-01 (320-66252-2), AKA-TWP-01 (320-66252-6), OME-MW01-15 (320-66252-7), OME-MW01-30 (320-66252-8), GP-TWP-01 (320-66252-11), MW-6 (320-66252-12) and MW-5 (320-66252-13) in preparation batch 320-428802 were observed to be yellow / orange in color prior to extraction.

Method 3535: The following samples ANG-TWP-02 (320-66252-1), ANG-TWP-01 (320-66252-2), OME-MW02-15 (320-66252-4), OME-MW03-15 (320-66252-5), AKA-TWP-01 (320-66252-6), OME-MW01-15 (320-66252-7), OME-MW01-30 (320-66252-8), GP-TWP-01 (320-66252-11), MW-6 (320-66252-12), MW-5 (320-66252-13), MW-D5-01 (320-66252-14) and GAC-POST (320-66252-15) in preparation batch 320-428802 were observed to contain a thin layer of sediment at the bottom of the bottle.

Method 3535: The following samples MW-D5-01 (320-66252-14) and GAC-POST (320-66252-15) in preparation batch 320-428802 were observed to be gray in color prior to extraction.

Method 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-428802.

Method 3535: During the solid phase extraction process, the following samples ANG-TWP-02 (320-66252-1), ANG-TWP-01 (320-66252-2), OME-MW02-15 (320-66252-4), OME-MW03-15 (320-66252-5), OME-MW01-15 (320-66252-7), OME-MW01-30 (320-66252-8), GP-TWP-01 (320-66252-11), MW-D5-01 (320-66252-14) and GAC-POST (320-66252-15) in preparation batch 320-428802 contained non-settable particulates which clogged the solid phase extraction column.

Method 537.1 DW: Sample is reddish-brown with a small amount of dark-brown sediment. Sample is turbid. Extract is reddish-brown and opaque. PW-181 (320-66252-3)

Method 537.1 DW: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-428484.

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: Nome DOT&PF

Job ID: 320-66252-1

Client Sample ID: ANG-TWP-02 — Lab Sample ID: 320-66252-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	100		1.8	0.53	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	11		1.8	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	4.4		1.8	0.77	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.44	J	1.8	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	12		1.8	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	33		1.8	0.52	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	26		1.8	0.49	ng/L	1		537 (modified)	Total/NA

Client Sample ID: ANG-TWP-01 — Lab Sample ID: 320-66252-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	100		1.9	0.55	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	12		1.9	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	4.6		1.9	0.81	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.52	J	1.9	0.26	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	12		1.9	0.19	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	32		1.9	0.54	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	27		1.9	0.51	ng/L	1		537 (modified)	Total/NA

Client Sample ID: PW-181 — Lab Sample ID: 320-66252-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	4.0		2.0	0.50	ng/L	1		537.1 DW	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.6	J	2.0	0.50	ng/L	1		537.1 DW	Total/NA
Perfluorooctanoic acid (PFOA)	1.8	J	2.0	0.50	ng/L	1		537.1 DW	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.0	J	2.0	0.50	ng/L	1		537.1 DW	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.2		2.0	0.50	ng/L	1		537.1 DW	Total/NA
Perfluorooctanesulfonic acid (PFOS)	6.3		2.0	0.50	ng/L	1		537.1 DW	Total/NA

Client Sample ID: OME-MW02-15 — Lab Sample ID: 320-66252-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	260		1.9	0.56	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	54		1.9	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	54		1.9	0.83	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	1.5	J	1.9	0.26	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	19		1.9	0.19	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	190		1.9	0.55	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	91		1.9	0.52	ng/L	1		537 (modified)	Total/NA

Client Sample ID: OME-MW03-15 — Lab Sample ID: 320-66252-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	270		1.8	0.54	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	49		1.8	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	55		1.8	0.79	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	1.5	J	1.8	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	18		1.8	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	180		1.8	0.53	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	86		1.8	0.50	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

Client Sample ID: AKA-TWP-01 — Lab Sample ID: 320-66252-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorononanoic acid (PFNA)	8.3		1.9	0.26	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.43	J	1.9	0.30	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	57		1.9	0.19	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	6500		190	56	ng/L	100		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	2000		190	24	ng/L	100		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	760		190	82	ng/L	100		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	1300		190	55	ng/L	100		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	2900		190	52	ng/L	100		537 (modified)	Total/NA

Client Sample ID: OME-MW01-15 — Lab Sample ID: 320-66252-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	65		1.7	0.50	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	15		1.7	0.22	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	8.0		1.7	0.74	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	21		1.7	0.17	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	80		1.7	0.49	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	53		1.7	0.47	ng/L	1		537 (modified)	Total/NA

Client Sample ID: OME-MW01-30 — Lab Sample ID: 320-66252-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	29		1.7	0.49	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	5.9		1.7	0.21	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	4.8		1.7	0.72	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	5.3		1.7	0.17	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	32		1.7	0.48	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	65		1.7	0.46	ng/L	1		537 (modified)	Total/NA

Client Sample ID: EB-MW01-15 — Lab Sample ID: 320-66252-9

No Detections.

Client Sample ID: FB-MW02-15 — Lab Sample ID: 320-66252-10

No Detections.

Client Sample ID: GP-TWP-01 — Lab Sample ID: 320-66252-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	1.1	J	1.9	0.56	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	1.4	J	1.9	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.88	J	1.9	0.26	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.98	J	1.9	0.55	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.7	J	1.9	0.52	ng/L	1		537 (modified)	Total/NA

Client Sample ID: MW-6 — Lab Sample ID: 320-66252-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	10		1.7	0.50	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.6		1.7	0.22	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	6.2		1.7	0.73	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.51	J	1.7	0.23	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-6 (Continued) — Lab Sample ID: 320-66252-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	2.0		1.7	0.17	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	15		1.7	0.49	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	20		1.7	0.47	ng/L	1		537 (modified)	Total/NA

Client Sample ID: MW-5 — Lab Sample ID: 320-66252-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	12		1.7	0.50	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.7		1.7	0.21	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	6.7		1.7	0.73	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.45	J	1.7	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	2.1		1.7	0.17	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	14		1.7	0.49	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	15		1.7	0.46	ng/L	1		537 (modified)	Total/NA

Client Sample ID: MW-D5-01 — Lab Sample ID: 320-66252-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	3.3		2.0	0.57	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.0		2.0	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	4.0		2.0	0.84	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.70	J	2.0	0.27	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.22	J	2.0	0.20	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.3	J	2.0	0.56	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.8	J	2.0	0.53	ng/L	1		537 (modified)	Total/NA

Client Sample ID: GAC-POST — Lab Sample ID: 320-66252-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanoic acid (PFHxA)	1.0	J	1.9	0.54	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.49	J	1.9	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.6	J	1.9	0.53	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	2.3		1.9	0.50	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

Client Sample ID: ANG-TWP-02

Date Collected: 10/27/20 18:12
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66252-1

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**100**		1.8	0.53	ng/L		11/05/20 12:38	11/07/20 14:15	1
Perfluoroheptanoic acid (PFHpA)	**11**		1.8	0.23	ng/L		11/05/20 12:38	11/07/20 14:15	1
Perfluorooctanoic acid (PFOA)	**4.4**		1.8	0.77	ng/L		11/05/20 12:38	11/07/20 14:15	1
Perfluorononanoic acid (PFNA)	**0.44**	**J**	1.8	0.25	ng/L		11/05/20 12:38	11/07/20 14:15	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.28	ng/L		11/05/20 12:38	11/07/20 14:15	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	1.0	ng/L		11/05/20 12:38	11/07/20 14:15	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.50	ng/L		11/05/20 12:38	11/07/20 14:15	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		11/05/20 12:38	11/07/20 14:15	1
Perfluorotetradecanoic acid (PFTeA)	ND	*1	1.8	0.66	ng/L		11/05/20 12:38	11/07/20 14:15	1
Perfluorobutanesulfonic acid (PFBS)	**12**		1.8	0.18	ng/L		11/05/20 12:38	11/07/20 14:15	1
Perfluorohexanesulfonic acid (PFHxS)	**33**		1.8	0.52	ng/L		11/05/20 12:38	11/07/20 14:15	1
Perfluorooctanesulfonic acid (PFOS)	**26**		1.8	0.49	ng/L		11/05/20 12:38	11/07/20 14:15	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.6	1.1	ng/L		11/05/20 12:38	11/07/20 14:15	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.6	1.2	ng/L		11/05/20 12:38	11/07/20 14:15	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.8	0.22	ng/L		11/05/20 12:38	11/07/20 14:15	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.6	1.4	ng/L		11/05/20 12:38	11/07/20 14:15	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.8	0.29	ng/L		11/05/20 12:38	11/07/20 14:15	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.8	0.36	ng/L		11/05/20 12:38	11/07/20 14:15	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*85*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:15*	*1*
13C4 PFHpA	*100*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:15*	*1*
13C4 PFOA	*97*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:15*	*1*
13C5 PFNA	*86*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:15*	*1*
13C2 PFDA	*81*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:15*	*1*
13C2 PFUnA	*86*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:15*	*1*
13C2 PFDoA	*97*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:15*	*1*
13C2 PFTeDA	*93*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:15*	*1*
13C3 PFBS	*91*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:15*	*1*
18O2 PFHxS	*101*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:15*	*1*
13C4 PFOS	*94*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:15*	*1*
d3-NMeFOSAA	*83*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:15*	*1*
d5-NEtFOSAA	*87*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:15*	*1*
13C3 HFPO-DA	*82*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:15*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

Client Sample ID: ANG-TWP-01

Date Collected: 10/27/20 18:02
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66252-2

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**100**		1.9	0.55	ng/L		11/05/20 12:38	11/07/20 14:24	1
Perfluoroheptanoic acid (PFHpA)	**12**		1.9	0.24	ng/L		11/05/20 12:38	11/07/20 14:24	1
Perfluorooctanoic acid (PFOA)	**4.6**		1.9	0.81	ng/L		11/05/20 12:38	11/07/20 14:24	1
Perfluorononanoic acid (PFNA)	**0.52**	**J**	1.9	0.26	ng/L		11/05/20 12:38	11/07/20 14:24	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.30	ng/L		11/05/20 12:38	11/07/20 14:24	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.0	ng/L		11/05/20 12:38	11/07/20 14:24	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.52	ng/L		11/05/20 12:38	11/07/20 14:24	1
Perfluorotridecanoic acid (PFTriA)	ND		1.9	1.2	ng/L		11/05/20 12:38	11/07/20 14:24	1
Perfluorotetradecanoic acid (PFTeA)	ND	*1	1.9	0.69	ng/L		11/05/20 12:38	11/07/20 14:24	1
Perfluorobutanesulfonic acid (PFBS)	**12**		1.9	0.19	ng/L		11/05/20 12:38	11/07/20 14:24	1
Perfluorohexanesulfonic acid (PFHxS)	**32**		1.9	0.54	ng/L		11/05/20 12:38	11/07/20 14:24	1
Perfluorooctanesulfonic acid (PFOS)	**27**		1.9	0.51	ng/L		11/05/20 12:38	11/07/20 14:24	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.8	1.1	ng/L		11/05/20 12:38	11/07/20 14:24	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.8	1.2	ng/L		11/05/20 12:38	11/07/20 14:24	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.9	0.23	ng/L		11/05/20 12:38	11/07/20 14:24	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.8	1.4	ng/L		11/05/20 12:38	11/07/20 14:24	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.9	0.30	ng/L		11/05/20 12:38	11/07/20 14:24	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.38	ng/L		11/05/20 12:38	11/07/20 14:24	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*102*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:24*	*1*
13C4 PFHpA	*109*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:24*	*1*
13C4 PFOA	*104*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:24*	*1*
13C5 PFNA	*102*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:24*	*1*
13C2 PFDA	*103*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:24*	*1*
13C2 PFUnA	*98*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:24*	*1*
13C2 PFDoA	*88*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:24*	*1*
13C2 PFTeDA	*97*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:24*	*1*
13C3 PFBS	*103*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:24*	*1*
18O2 PFHxS	*115*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:24*	*1*
13C4 PFOS	*103*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:24*	*1*
d3-NMeFOSAA	*88*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:24*	*1*
d5-NEtFOSAA	*90*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:24*	*1*
13C3 HFPO-DA	*92*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:24*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

Client Sample ID: PW-181
Date Collected: 10/28/20 19:33
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66252-3
Matrix: Water

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**4.0**		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:27	1
Perfluoroheptanoic acid (PFHpA)	**1.6**	**J**	2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:27	1
Perfluorooctanoic acid (PFOA)	**1.8**	**J**	2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:27	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:27	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:27	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:27	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:27	1
Perfluorotridecanoic acid (PFTriA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:27	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:27	1
Perfluorobutanesulfonic acid (PFBS)	**1.0**	**J**	2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:27	1
Perfluorohexanesulfonic acid (PFHxS)	**6.2**		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:27	1
Perfluorooctanesulfonic acid (PFOS)	**6.3**		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:27	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:27	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:27	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:27	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:27	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:27	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*88*		*70 - 130*	*11/04/20 21:24*	*11/05/20 09:27*	*1*
13C2 PFDA	*84*		*70 - 130*	*11/04/20 21:24*	*11/05/20 09:27*	*1*
d5-NEtFOSAA	*81*		*70 - 130*	*11/04/20 21:24*	*11/05/20 09:27*	*1*
13C3 HFPO-DA	*82*		*70 - 130*	*11/04/20 21:24*	*11/05/20 09:27*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

Client Sample ID: OME-MW02-15

Date Collected: 10/31/20 12:30
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66252-4

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**260**		1.9	0.56	ng/L		11/05/20 12:38	11/07/20 14:33	1
Perfluoroheptanoic acid (PFHpA)	**54**		1.9	0.24	ng/L		11/05/20 12:38	11/07/20 14:33	1
Perfluorooctanoic acid (PFOA)	**54**		1.9	0.83	ng/L		11/05/20 12:38	11/07/20 14:33	1
Perfluorononanoic acid (PFNA)	**1.5**	**J**	1.9	0.26	ng/L		11/05/20 12:38	11/07/20 14:33	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.30	ng/L		11/05/20 12:38	11/07/20 14:33	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.1	ng/L		11/05/20 12:38	11/07/20 14:33	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.53	ng/L		11/05/20 12:38	11/07/20 14:33	1
Perfluorotridecanoic acid (PFTriA)	ND		1.9	1.3	ng/L		11/05/20 12:38	11/07/20 14:33	1
Perfluorotetradecanoic acid (PFTeA)	ND	*1	1.9	0.71	ng/L		11/05/20 12:38	11/07/20 14:33	1
Perfluorobutanesulfonic acid (PFBS)	**19**		1.9	0.19	ng/L		11/05/20 12:38	11/07/20 14:33	1
Perfluorohexanesulfonic acid (PFHxS)	**190**		1.9	0.55	ng/L		11/05/20 12:38	11/07/20 14:33	1
Perfluorooctanesulfonic acid (PFOS)	**91**		1.9	0.52	ng/L		11/05/20 12:38	11/07/20 14:33	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.9	1.2	ng/L		11/05/20 12:38	11/07/20 14:33	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.9	1.3	ng/L		11/05/20 12:38	11/07/20 14:33	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.9	0.23	ng/L		11/05/20 12:38	11/07/20 14:33	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.9	1.5	ng/L		11/05/20 12:38	11/07/20 14:33	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.9	0.31	ng/L		11/05/20 12:38	11/07/20 14:33	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.39	ng/L		11/05/20 12:38	11/07/20 14:33	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*97*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:33*	*1*
13C4 PFHpA	*107*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:33*	*1*
13C4 PFOA	*105*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:33*	*1*
13C5 PFNA	*106*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:33*	*1*
13C2 PFDA	*96*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:33*	*1*
13C2 PFUnA	*88*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:33*	*1*
13C2 PFDoA	*76*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:33*	*1*
13C2 PFTeDA	*91*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:33*	*1*
13C3 PFBS	*96*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:33*	*1*
18O2 PFHxS	*113*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:33*	*1*
13C4 PFOS	*105*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:33*	*1*
d3-NMeFOSAA	*91*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:33*	*1*
d5-NEtFOSAA	*94*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:33*	*1*
13C3 HFPO-DA	*94*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:33*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

Client Sample ID: OME-MW03-15

Date Collected: 10/31/20 12:40
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66252-5

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**270**		1.8	0.54	ng/L		11/05/20 12:38	11/07/20 14:42	1
Perfluoroheptanoic acid (PFHpA)	**49**		1.8	0.23	ng/L		11/05/20 12:38	11/07/20 14:42	1
Perfluorooctanoic acid (PFOA)	**55**		1.8	0.79	ng/L		11/05/20 12:38	11/07/20 14:42	1
Perfluorononanoic acid (PFNA)	**1.5**	**J**	1.8	0.25	ng/L		11/05/20 12:38	11/07/20 14:42	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.29	ng/L		11/05/20 12:38	11/07/20 14:42	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	1.0	ng/L		11/05/20 12:38	11/07/20 14:42	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.51	ng/L		11/05/20 12:38	11/07/20 14:42	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		11/05/20 12:38	11/07/20 14:42	1
Perfluorotetradecanoic acid (PFTeA)	ND	*1	1.8	0.68	ng/L		11/05/20 12:38	11/07/20 14:42	1
Perfluorobutanesulfonic acid (PFBS)	**18**		1.8	0.18	ng/L		11/05/20 12:38	11/07/20 14:42	1
Perfluorohexanesulfonic acid (PFHxS)	**180**		1.8	0.53	ng/L		11/05/20 12:38	11/07/20 14:42	1
Perfluorooctanesulfonic acid (PFOS)	**86**		1.8	0.50	ng/L		11/05/20 12:38	11/07/20 14:42	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.6	1.1	ng/L		11/05/20 12:38	11/07/20 14:42	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.6	1.2	ng/L		11/05/20 12:38	11/07/20 14:42	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.8	0.22	ng/L		11/05/20 12:38	11/07/20 14:42	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.7	1.4	ng/L		11/05/20 12:38	11/07/20 14:42	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.8	0.30	ng/L		11/05/20 12:38	11/07/20 14:42	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.8	0.37	ng/L		11/05/20 12:38	11/07/20 14:42	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*89*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:42*	*1*
13C4 PFHpA	*91*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:42*	*1*
13C4 PFOA	*92*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:42*	*1*
13C5 PFNA	*94*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:42*	*1*
13C2 PFDA	*84*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:42*	*1*
13C2 PFUnA	*74*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:42*	*1*
13C2 PFDoA	*75*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:42*	*1*
13C2 PFTeDA	*82*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:42*	*1*
13C3 PFBS	*91*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:42*	*1*
18O2 PFHxS	*104*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:42*	*1*
13C4 PFOS	*98*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:42*	*1*
d3-NMeFOSAA	*76*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:42*	*1*
d5-NEtFOSAA	*83*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:42*	*1*
13C3 HFPO-DA	*82*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:42*	*1*

Client Sample ID: AKA-TWP-01

Date Collected: 10/31/20 15:04
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66252-6

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorononanoic acid (PFNA)	**8.3**		1.9	0.26	ng/L		11/05/20 12:38	11/07/20 14:51	1
Perfluorodecanoic acid (PFDA)	**0.43**	**J**	1.9	0.30	ng/L		11/05/20 12:38	11/07/20 14:51	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.1	ng/L		11/05/20 12:38	11/07/20 14:51	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.53	ng/L		11/05/20 12:38	11/07/20 14:51	1
Perfluorotridecanoic acid (PFTriA)	ND		1.9	1.3	ng/L		11/05/20 12:38	11/07/20 14:51	1
Perfluorotetradecanoic acid (PFTeA)	ND	*1	1.9	0.70	ng/L		11/05/20 12:38	11/07/20 14:51	1
Perfluorobutanesulfonic acid (PFBS)	**57**		1.9	0.19	ng/L		11/05/20 12:38	11/07/20 14:51	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.8	1.2	ng/L		11/05/20 12:38	11/07/20 14:51	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.8	1.3	ng/L		11/05/20 12:38	11/07/20 14:51	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.9	0.23	ng/L		11/05/20 12:38	11/07/20 14:51	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.8	1.4	ng/L		11/05/20 12:38	11/07/20 14:51	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.9	0.31	ng/L		11/05/20 12:38	11/07/20 14:51	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.38	ng/L		11/05/20 12:38	11/07/20 14:51	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C5 PFNA	*94*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:51*	*1*
13C2 PFDA	*108*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:51*	*1*
13C2 PFUnA	*115*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:51*	*1*
13C2 PFDoA	*126*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:51*	*1*
13C2 PFTeDA	*125*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:51*	*1*
13C3 PFBS	*113*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:51*	*1*
13C4 PFOS	*109*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:51*	*1*
d3-NMeFOSAA	*100*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:51*	*1*
d5-NEtFOSAA	*110*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:51*	*1*
13C3 HFPO-DA	*100*		*25 - 150*	*11/05/20 12:38*	*11/07/20 14:51*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**6500**		190	56	ng/L		11/05/20 12:38	11/08/20 19:50	100
Perfluoroheptanoic acid (PFHpA)	**2000**		190	24	ng/L		11/05/20 12:38	11/08/20 19:50	100
Perfluorooctanoic acid (PFOA)	**760**		190	82	ng/L		11/05/20 12:38	11/08/20 19:50	100
Perfluorohexanesulfonic acid (PFHxS)	**1300**		190	55	ng/L		11/05/20 12:38	11/08/20 19:50	100
Perfluorooctanesulfonic acid (PFOS)	**2900**		190	52	ng/L		11/05/20 12:38	11/08/20 19:50	100

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*85*		*25 - 150*	*11/05/20 12:38*	*11/08/20 19:50*	*100*
13C4 PFHpA	*87*		*25 - 150*	*11/05/20 12:38*	*11/08/20 19:50*	*100*
13C4 PFOA	*96*		*25 - 150*	*11/05/20 12:38*	*11/08/20 19:50*	*100*
18O2 PFHxS	*101*		*25 - 150*	*11/05/20 12:38*	*11/08/20 19:50*	*100*
13C4 PFOS	*97*		*25 - 150*	*11/05/20 12:38*	*11/08/20 19:50*	*100*

Client Sample ID: OME-MW01-15

Date Collected: 10/31/20 17:35
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66252-7

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**65**		1.7	0.50	ng/L		11/05/20 12:38	11/07/20 15:00	1
Perfluoroheptanoic acid (PFHpA)	**15**		1.7	0.22	ng/L		11/05/20 12:38	11/07/20 15:00	1
Perfluorooctanoic acid (PFOA)	**8.0**		1.7	0.74	ng/L		11/05/20 12:38	11/07/20 15:00	1
Perfluorononanoic acid (PFNA)	ND		1.7	0.23	ng/L		11/05/20 12:38	11/07/20 15:00	1
Perfluorodecanoic acid (PFDA)	ND		1.7	0.27	ng/L		11/05/20 12:38	11/07/20 15:00	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.95	ng/L		11/05/20 12:38	11/07/20 15:00	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.48	ng/L		11/05/20 12:38	11/07/20 15:00	1
Perfluorotridecanoic acid (PFTriA)	ND		1.7	1.1	ng/L		11/05/20 12:38	11/07/20 15:00	1
Perfluorotetradecanoic acid (PFTeA)	ND	*1	1.7	0.63	ng/L		11/05/20 12:38	11/07/20 15:00	1
Perfluorobutanesulfonic acid (PFBS)	**21**		1.7	0.17	ng/L		11/05/20 12:38	11/07/20 15:00	1
Perfluorohexanesulfonic acid (PFHxS)	**80**		1.7	0.49	ng/L		11/05/20 12:38	11/07/20 15:00	1
Perfluorooctanesulfonic acid (PFOS)	**53**		1.7	0.47	ng/L		11/05/20 12:38	11/07/20 15:00	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.3	1.0	ng/L		11/05/20 12:38	11/07/20 15:00	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.3	1.1	ng/L		11/05/20 12:38	11/07/20 15:00	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.7	0.21	ng/L		11/05/20 12:38	11/07/20 15:00	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.5	1.3	ng/L		11/05/20 12:38	11/07/20 15:00	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.7	0.28	ng/L		11/05/20 12:38	11/07/20 15:00	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.7	0.35	ng/L		11/05/20 12:38	11/07/20 15:00	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*74*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:00*	*1*
13C4 PFHpA	*80*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:00*	*1*
13C4 PFOA	*82*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:00*	*1*
13C5 PFNA	*81*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:00*	*1*
13C2 PFDA	*76*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:00*	*1*
13C2 PFUnA	*72*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:00*	*1*
13C2 PFDoA	*74*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:00*	*1*
13C2 PFTeDA	*71*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:00*	*1*
13C3 PFBS	*79*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:00*	*1*
18O2 PFHxS	*85*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:00*	*1*
13C4 PFOS	*84*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:00*	*1*
d3-NMeFOSAA	*66*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:00*	*1*
d5-NEtFOSAA	*74*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:00*	*1*
13C3 HFPO-DA	*73*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:00*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

Client Sample ID: OME-MW01-30

Date Collected: 10/31/20 16:40
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66252-8

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**29**		1.7	0.49	ng/L		11/05/20 12:38	11/07/20 15:09	1
Perfluoroheptanoic acid (PFHpA)	**5.9**		1.7	0.21	ng/L		11/05/20 12:38	11/07/20 15:09	1
Perfluorooctanoic acid (PFOA)	**4.8**		1.7	0.72	ng/L		11/05/20 12:38	11/07/20 15:09	1
Perfluorononanoic acid (PFNA)	ND		1.7	0.23	ng/L		11/05/20 12:38	11/07/20 15:09	1
Perfluorodecanoic acid (PFDA)	ND		1.7	0.26	ng/L		11/05/20 12:38	11/07/20 15:09	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.93	ng/L		11/05/20 12:38	11/07/20 15:09	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.47	ng/L		11/05/20 12:38	11/07/20 15:09	1
Perfluorotridecanoic acid (PFTriA)	ND		1.7	1.1	ng/L		11/05/20 12:38	11/07/20 15:09	1
Perfluorotetradecanoic acid (PFTeA)	ND	*1	1.7	0.62	ng/L		11/05/20 12:38	11/07/20 15:09	1
Perfluorobutanesulfonic acid (PFBS)	**5.3**		1.7	0.17	ng/L		11/05/20 12:38	11/07/20 15:09	1
Perfluorohexanesulfonic acid (PFHxS)	**32**		1.7	0.48	ng/L		11/05/20 12:38	11/07/20 15:09	1
Perfluorooctanesulfonic acid (PFOS)	**65**		1.7	0.46	ng/L		11/05/20 12:38	11/07/20 15:09	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.2	1.0	ng/L		11/05/20 12:38	11/07/20 15:09	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.2	1.1	ng/L		11/05/20 12:38	11/07/20 15:09	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.7	0.20	ng/L		11/05/20 12:38	11/07/20 15:09	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.4	1.3	ng/L		11/05/20 12:38	11/07/20 15:09	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.7	0.27	ng/L		11/05/20 12:38	11/07/20 15:09	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.7	0.34	ng/L		11/05/20 12:38	11/07/20 15:09	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*77*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:09*	*1*
13C4 PFHpA	*76*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:09*	*1*
13C4 PFOA	*80*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:09*	*1*
13C5 PFNA	*76*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:09*	*1*
13C2 PFDA	*76*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:09*	*1*
13C2 PFUnA	*67*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:09*	*1*
13C2 PFDoA	*66*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:09*	*1*
13C2 PFTeDA	*73*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:09*	*1*
13C3 PFBS	*82*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:09*	*1*
18O2 PFHxS	*84*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:09*	*1*
13C4 PFOS	*85*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:09*	*1*
d3-NMeFOSAA	*70*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:09*	*1*
d5-NEtFOSAA	*70*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:09*	*1*
13C3 HFPO-DA	*71*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:09*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

Client Sample ID: EB-MW01-15

Date Collected: 10/31/20 18:00
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66252-9

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.58	ng/L		11/05/20 12:38	11/07/20 15:37	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.25	ng/L		11/05/20 12:38	11/07/20 15:37	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.84	ng/L		11/05/20 12:38	11/07/20 15:37	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.27	ng/L		11/05/20 12:38	11/07/20 15:37	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.31	ng/L		11/05/20 12:38	11/07/20 15:37	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		11/05/20 12:38	11/07/20 15:37	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.55	ng/L		11/05/20 12:38	11/07/20 15:37	1
Perfluorotridecanoic acid (PFTriA)	ND		2.0	1.3	ng/L		11/05/20 12:38	11/07/20 15:37	1
Perfluorotetradecanoic acid (PFTeA)	ND	*1	2.0	0.72	ng/L		11/05/20 12:38	11/07/20 15:37	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.20	ng/L		11/05/20 12:38	11/07/20 15:37	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.57	ng/L		11/05/20 12:38	11/07/20 15:37	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	0.54	ng/L		11/05/20 12:38	11/07/20 15:37	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		5.0	1.2	ng/L		11/05/20 12:38	11/07/20 15:37	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		5.0	1.3	ng/L		11/05/20 12:38	11/07/20 15:37	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.0	0.24	ng/L		11/05/20 12:38	11/07/20 15:37	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		4.0	1.5	ng/L		11/05/20 12:38	11/07/20 15:37	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.0	0.32	ng/L		11/05/20 12:38	11/07/20 15:37	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0	0.40	ng/L		11/05/20 12:38	11/07/20 15:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*116*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:37*	*1*
13C4 PFHpA	*122*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:37*	*1*
13C4 PFOA	*122*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:37*	*1*
13C5 PFNA	*118*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:37*	*1*
13C2 PFDA	*112*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:37*	*1*
13C2 PFUnA	*109*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:37*	*1*
13C2 PFDoA	*114*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:37*	*1*
13C2 PFTeDA	*103*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:37*	*1*
13C3 PFBS	*116*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:37*	*1*
18O2 PFHxS	*127*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:37*	*1*
13C4 PFOS	*125*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:37*	*1*
d3-NMeFOSAA	*123*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:37*	*1*
d5-NEtFOSAA	*113*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:37*	*1*
13C3 HFPO-DA	*106*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:37*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

Client Sample ID: FB-MW02-15

Date Collected: 10/31/20 12:45
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66252-10

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		1.7	0.50	ng/L		11/05/20 12:38	11/07/20 15:46	1
Perfluoroheptanoic acid (PFHpA)	ND		1.7	0.22	ng/L		11/05/20 12:38	11/07/20 15:46	1
Perfluorooctanoic acid (PFOA)	ND		1.7	0.73	ng/L		11/05/20 12:38	11/07/20 15:46	1
Perfluorononanoic acid (PFNA)	ND		1.7	0.23	ng/L		11/05/20 12:38	11/07/20 15:46	1
Perfluorodecanoic acid (PFDA)	ND		1.7	0.27	ng/L		11/05/20 12:38	11/07/20 15:46	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.95	ng/L		11/05/20 12:38	11/07/20 15:46	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.47	ng/L		11/05/20 12:38	11/07/20 15:46	1
Perfluorotridecanoic acid (PFTriA)	ND		1.7	1.1	ng/L		11/05/20 12:38	11/07/20 15:46	1
Perfluorotetradecanoic acid (PFTeA)	ND	*1	1.7	0.63	ng/L		11/05/20 12:38	11/07/20 15:46	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.7	0.17	ng/L		11/05/20 12:38	11/07/20 15:46	1
Perfluorohexanesulfonic acid (PFHxS)	ND		1.7	0.49	ng/L		11/05/20 12:38	11/07/20 15:46	1
Perfluorooctanesulfonic acid (PFOS)	ND		1.7	0.47	ng/L		11/05/20 12:38	11/07/20 15:46	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.3	1.0	ng/L		11/05/20 12:38	11/07/20 15:46	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.3	1.1	ng/L		11/05/20 12:38	11/07/20 15:46	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.7	0.21	ng/L		11/05/20 12:38	11/07/20 15:46	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.5	1.3	ng/L		11/05/20 12:38	11/07/20 15:46	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.7	0.28	ng/L		11/05/20 12:38	11/07/20 15:46	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.7	0.35	ng/L		11/05/20 12:38	11/07/20 15:46	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*104*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:46*	*1*
13C4 PFHpA	*108*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:46*	*1*
13C4 PFOA	*105*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:46*	*1*
13C5 PFNA	*99*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:46*	*1*
13C2 PFDA	*100*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:46*	*1*
13C2 PFUnA	*104*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:46*	*1*
13C2 PFDoA	*96*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:46*	*1*
13C2 PFTeDA	*114*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:46*	*1*
13C3 PFBS	*111*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:46*	*1*
18O2 PFHxS	*111*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:46*	*1*
13C4 PFOS	*106*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:46*	*1*
d3-NMeFOSAA	*107*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:46*	*1*
d5-NEtFOSAA	*102*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:46*	*1*
13C3 HFPO-DA	*94*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:46*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

Client Sample ID: GP-TWP-01

Date Collected: 10/27/20 21:16
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66252-11

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**1.1**	**J**	1.9	0.56	ng/L		11/05/20 12:38	11/07/20 15:55	1
Perfluoroheptanoic acid (PFHpA)	**1.4**	**J**	1.9	0.24	ng/L		11/05/20 12:38	11/07/20 15:55	1
Perfluorooctanoic acid (PFOA)	ND		1.9	0.82	ng/L		11/05/20 12:38	11/07/20 15:55	1
Perfluorononanoic acid (PFNA)	**0.88**	**J**	1.9	0.26	ng/L		11/05/20 12:38	11/07/20 15:55	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.30	ng/L		11/05/20 12:38	11/07/20 15:55	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.1	ng/L		11/05/20 12:38	11/07/20 15:55	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.53	ng/L		11/05/20 12:38	11/07/20 15:55	1
Perfluorotridecanoic acid (PFTriA)	ND		1.9	1.2	ng/L		11/05/20 12:38	11/07/20 15:55	1
Perfluorotetradecanoic acid (PFTeA)	ND	*1	1.9	0.70	ng/L		11/05/20 12:38	11/07/20 15:55	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.9	0.19	ng/L		11/05/20 12:38	11/07/20 15:55	1
Perfluorohexanesulfonic acid (PFHxS)	**0.98**	**J**	1.9	0.55	ng/L		11/05/20 12:38	11/07/20 15:55	1
Perfluorooctanesulfonic acid (PFOS)	**1.7**	**J**	1.9	0.52	ng/L		11/05/20 12:38	11/07/20 15:55	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.8	1.2	ng/L		11/05/20 12:38	11/07/20 15:55	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.8	1.2	ng/L		11/05/20 12:38	11/07/20 15:55	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.9	0.23	ng/L		11/05/20 12:38	11/07/20 15:55	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.8	1.4	ng/L		11/05/20 12:38	11/07/20 15:55	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.9	0.31	ng/L		11/05/20 12:38	11/07/20 15:55	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.38	ng/L		11/05/20 12:38	11/07/20 15:55	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*72*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:55*	*1*
13C4 PFHpA	*77*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:55*	*1*
13C4 PFOA	*84*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:55*	*1*
13C5 PFNA	*79*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:55*	*1*
13C2 PFDA	*77*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:55*	*1*
13C2 PFUnA	*69*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:55*	*1*
13C2 PFDoA	*71*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:55*	*1*
13C2 PFTeDA	*70*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:55*	*1*
13C3 PFBS	*86*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:55*	*1*
18O2 PFHxS	*90*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:55*	*1*
13C4 PFOS	*83*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:55*	*1*
d3-NMeFOSAA	*67*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:55*	*1*
d5-NEtFOSAA	*73*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:55*	*1*
13C3 HFPO-DA	*71*		*25 - 150*	*11/05/20 12:38*	*11/07/20 15:55*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

Client Sample ID: MW-6

Date Collected: 10/28/20 15:05
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66252-12

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**10**		1.7	0.50	ng/L		11/05/20 12:38	11/07/20 16:04	1
Perfluoroheptanoic acid (PFHpA)	**4.6**		1.7	0.22	ng/L		11/05/20 12:38	11/07/20 16:04	1
Perfluorooctanoic acid (PFOA)	**6.2**		1.7	0.73	ng/L		11/05/20 12:38	11/07/20 16:04	1
Perfluorononanoic acid (PFNA)	**0.51**	**J**	1.7	0.23	ng/L		11/05/20 12:38	11/07/20 16:04	1
Perfluorodecanoic acid (PFDA)	ND		1.7	0.27	ng/L		11/05/20 12:38	11/07/20 16:04	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.95	ng/L		11/05/20 12:38	11/07/20 16:04	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.47	ng/L		11/05/20 12:38	11/07/20 16:04	1
Perfluorotridecanoic acid (PFTriA)	ND		1.7	1.1	ng/L		11/05/20 12:38	11/07/20 16:04	1
Perfluorotetradecanoic acid (PFTeA)	ND	*1	1.7	0.63	ng/L		11/05/20 12:38	11/07/20 16:04	1
Perfluorobutanesulfonic acid (PFBS)	**2.0**		1.7	0.17	ng/L		11/05/20 12:38	11/07/20 16:04	1
Perfluorohexanesulfonic acid (PFHxS)	**15**		1.7	0.49	ng/L		11/05/20 12:38	11/07/20 16:04	1
Perfluorooctanesulfonic acid (PFOS)	**20**		1.7	0.47	ng/L		11/05/20 12:38	11/07/20 16:04	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.3	1.0	ng/L		11/05/20 12:38	11/07/20 16:04	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.3	1.1	ng/L		11/05/20 12:38	11/07/20 16:04	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.7	0.21	ng/L		11/05/20 12:38	11/07/20 16:04	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.4	1.3	ng/L		11/05/20 12:38	11/07/20 16:04	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.7	0.28	ng/L		11/05/20 12:38	11/07/20 16:04	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.7	0.34	ng/L		11/05/20 12:38	11/07/20 16:04	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*98*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:04*	*1*
13C4 PFHpA	*115*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:04*	*1*
13C4 PFOA	*112*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:04*	*1*
13C5 PFNA	*97*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:04*	*1*
13C2 PFDA	*107*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:04*	*1*
13C2 PFUnA	*104*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:04*	*1*
13C2 PFDoA	*107*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:04*	*1*
13C2 PFTeDA	*110*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:04*	*1*
13C3 PFBS	*107*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:04*	*1*
18O2 PFHxS	*112*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:04*	*1*
13C4 PFOS	*111*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:04*	*1*
d3-NMeFOSAA	*91*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:04*	*1*
d5-NEtFOSAA	*96*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:04*	*1*
13C3 HFPO-DA	*97*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:04*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

Client Sample ID: MW-5

Date Collected: 10/28/20 15:15
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66252-13

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**12**		1.7	0.50	ng/L		11/05/20 12:38	11/07/20 16:13	1
Perfluoroheptanoic acid (PFHpA)	**4.7**		1.7	0.21	ng/L		11/05/20 12:38	11/07/20 16:13	1
Perfluorooctanoic acid (PFOA)	**6.7**		1.7	0.73	ng/L		11/05/20 12:38	11/07/20 16:13	1
Perfluorononanoic acid (PFNA)	**0.45**	**J**	1.7	0.23	ng/L		11/05/20 12:38	11/07/20 16:13	1
Perfluorodecanoic acid (PFDA)	ND		1.7	0.27	ng/L		11/05/20 12:38	11/07/20 16:13	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.94	ng/L		11/05/20 12:38	11/07/20 16:13	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.47	ng/L		11/05/20 12:38	11/07/20 16:13	1
Perfluorotridecanoic acid (PFTriA)	ND		1.7	1.1	ng/L		11/05/20 12:38	11/07/20 16:13	1
Perfluorotetradecanoic acid (PFTeA)	ND	*1	1.7	0.63	ng/L		11/05/20 12:38	11/07/20 16:13	1
Perfluorobutanesulfonic acid (PFBS)	**2.1**		1.7	0.17	ng/L		11/05/20 12:38	11/07/20 16:13	1
Perfluorohexanesulfonic acid (PFHxS)	**14**		1.7	0.49	ng/L		11/05/20 12:38	11/07/20 16:13	1
Perfluorooctanesulfonic acid (PFOS)	**15**		1.7	0.46	ng/L		11/05/20 12:38	11/07/20 16:13	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.3	1.0	ng/L		11/05/20 12:38	11/07/20 16:13	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.3	1.1	ng/L		11/05/20 12:38	11/07/20 16:13	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.7	0.21	ng/L		11/05/20 12:38	11/07/20 16:13	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.4	1.3	ng/L		11/05/20 12:38	11/07/20 16:13	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.7	0.27	ng/L		11/05/20 12:38	11/07/20 16:13	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.7	0.34	ng/L		11/05/20 12:38	11/07/20 16:13	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*115*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:13*	*1*
13C4 PFHpA	*130*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:13*	*1*
13C4 PFOA	*126*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:13*	*1*
13C5 PFNA	*124*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:13*	*1*
13C2 PFDA	*129*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:13*	*1*
13C2 PFUnA	*117*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:13*	*1*
13C2 PFDoA	*132*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:13*	*1*
13C2 PFTeDA	*128*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:13*	*1*
13C3 PFBS	*115*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:13*	*1*
18O2 PFHxS	*135*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:13*	*1*
13C4 PFOS	*124*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:13*	*1*
d3-NMeFOSAA	*107*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:13*	*1*
d5-NEtFOSAA	*113*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:13*	*1*
13C3 HFPO-DA	*112*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:13*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

Client Sample ID: MW-D5-01

Date Collected: 10/28/20 20:48
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66252-14

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**3.3**		2.0	0.57	ng/L		11/05/20 12:38	11/07/20 16:22	1
Perfluoroheptanoic acid (PFHpA)	**3.0**		2.0	0.25	ng/L		11/05/20 12:38	11/07/20 16:22	1
Perfluorooctanoic acid (PFOA)	**4.0**		2.0	0.84	ng/L		11/05/20 12:38	11/07/20 16:22	1
Perfluorononanoic acid (PFNA)	**0.70**	**J**	2.0	0.27	ng/L		11/05/20 12:38	11/07/20 16:22	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.31	ng/L		11/05/20 12:38	11/07/20 16:22	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		11/05/20 12:38	11/07/20 16:22	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.54	ng/L		11/05/20 12:38	11/07/20 16:22	1
Perfluorotridecanoic acid (PFTriA)	ND		2.0	1.3	ng/L		11/05/20 12:38	11/07/20 16:22	1
Perfluorotetradecanoic acid (PFTeA)	ND	*1	2.0	0.72	ng/L		11/05/20 12:38	11/07/20 16:22	1
Perfluorobutanesulfonic acid (PFBS)	**0.22**	**J**	2.0	0.20	ng/L		11/05/20 12:38	11/07/20 16:22	1
Perfluorohexanesulfonic acid (PFHxS)	**1.3**	**J**	2.0	0.56	ng/L		11/05/20 12:38	11/07/20 16:22	1
Perfluorooctanesulfonic acid (PFOS)	**1.8**	**J**	2.0	0.53	ng/L		11/05/20 12:38	11/07/20 16:22	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.9	1.2	ng/L		11/05/20 12:38	11/07/20 16:22	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.9	1.3	ng/L		11/05/20 12:38	11/07/20 16:22	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.0	0.24	ng/L		11/05/20 12:38	11/07/20 16:22	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.9	1.5	ng/L		11/05/20 12:38	11/07/20 16:22	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.0	0.32	ng/L		11/05/20 12:38	11/07/20 16:22	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0	0.39	ng/L		11/05/20 12:38	11/07/20 16:22	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*91*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:22*	*1*
13C4 PFHpA	*86*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:22*	*1*
13C4 PFOA	*94*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:22*	*1*
13C5 PFNA	*92*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:22*	*1*
13C2 PFDA	*74*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:22*	*1*
13C2 PFUnA	*67*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:22*	*1*
13C2 PFDoA	*67*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:22*	*1*
13C2 PFTeDA	*79*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:22*	*1*
13C3 PFBS	*88*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:22*	*1*
18O2 PFHxS	*90*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:22*	*1*
13C4 PFOS	*82*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:22*	*1*
d3-NMeFOSAA	*75*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:22*	*1*
d5-NEtFOSAA	*76*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:22*	*1*
13C3 HFPO-DA	*83*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:22*	*1*

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

Client Sample ID: GAC-POST

Date Collected: 11/01/20 16:00
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66252-15

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	**1.0**	**J**	1.9	0.54	ng/L		11/05/20 12:38	11/07/20 16:32	1
Perfluoroheptanoic acid (PFHpA)	**0.49**	**J**	1.9	0.23	ng/L		11/05/20 12:38	11/07/20 16:32	1
Perfluorooctanoic acid (PFOA)	ND		1.9	0.79	ng/L		11/05/20 12:38	11/07/20 16:32	1
Perfluorononanoic acid (PFNA)	ND		1.9	0.25	ng/L		11/05/20 12:38	11/07/20 16:32	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.29	ng/L		11/05/20 12:38	11/07/20 16:32	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.0	ng/L		11/05/20 12:38	11/07/20 16:32	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.51	ng/L		11/05/20 12:38	11/07/20 16:32	1
Perfluorotridecanoic acid (PFTriA)	ND		1.9	1.2	ng/L		11/05/20 12:38	11/07/20 16:32	1
Perfluorotetradecanoic acid (PFTeA)	ND	*1	1.9	0.68	ng/L		11/05/20 12:38	11/07/20 16:32	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.9	0.19	ng/L		11/05/20 12:38	11/07/20 16:32	1
Perfluorohexanesulfonic acid (PFHxS)	**1.6**	**J**	1.9	0.53	ng/L		11/05/20 12:38	11/07/20 16:32	1
Perfluorooctanesulfonic acid (PFOS)	**2.3**		1.9	0.50	ng/L		11/05/20 12:38	11/07/20 16:32	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.6	1.1	ng/L		11/05/20 12:38	11/07/20 16:32	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.6	1.2	ng/L		11/05/20 12:38	11/07/20 16:32	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		1.9	0.22	ng/L		11/05/20 12:38	11/07/20 16:32	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		3.7	1.4	ng/L		11/05/20 12:38	11/07/20 16:32	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		1.9	0.30	ng/L		11/05/20 12:38	11/07/20 16:32	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		1.9	0.37	ng/L		11/05/20 12:38	11/07/20 16:32	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*39*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:32*	*1*
13C4 PFHpA	*38*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:32*	*1*
13C4 PFOA	*38*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:32*	*1*
13C5 PFNA	*37*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:32*	*1*
13C2 PFDA	*37*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:32*	*1*
13C2 PFUnA	*36*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:32*	*1*
13C2 PFDoA	*38*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:32*	*1*
13C2 PFTeDA	*47*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:32*	*1*
13C3 PFBS	*36*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:32*	*1*
18O2 PFHxS	*39*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:32*	*1*
13C4 PFOS	*39*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:32*	*1*
d3-NMeFOSAA	*37*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:32*	*1*
d5-NEtFOSAA	*37*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:32*	*1*
13C3 HFPO-DA	*40*		*25 - 150*	*11/05/20 12:38*	*11/07/20 16:32*	*1*

Surrogate Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	PFHxA (70-130)	PFDA (70-130)	d5NEFOS (70-130)	HFPODA (70-130)
320-66252-3	PW-181	88	84	81	82
LLCS 320-428484/2-A	Lab Control Sample	92	90	89	86
LLCSD 320-428484/3-A	Lab Control Sample Dup	92	87	86	88
MB 320-428484/1-A	Method Blank	90	90	90	88

Surrogate Legend

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA
d5NEFOS = d5-NEtFOSAA
HFPODA = 13C3 HFPO-DA

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

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)	PFDoA (25-150)	PFTDA (25-150)
320-66252-1	ANG-TWP-02	85	100	97	86	81	86	97	93
320-66252-2	ANG-TWP-01	102	109	104	102	103	98	88	97
320-66252-4	OME-MW02-15	97	107	105	106	96	88	76	91
320-66252-5	OME-MW03-15	89	91	92	94	84	74	75	82
320-66252-6	AKA-TWP-01				94	108	115	126	125
320-66252-6 - DL	AKA-TWP-01	85	87	96					
320-66252-7	OME-MW01-15	74	80	82	81	76	72	74	71
320-66252-8	OME-MW01-30	77	76	80	76	76	67	66	73
320-66252-9	EB-MW01-15	116	122	122	118	112	109	114	103
320-66252-10	FB-MW02-15	104	108	105	99	100	104	96	114
320-66252-11	GP-TWP-01	72	77	84	79	77	69	71	70
320-66252-12	MW-6	98	115	112	97	107	104	107	110
320-66252-13	MW-5	115	130	126	124	129	117	132	128
320-66252-14	MW-D5-01	91	86	94	92	74	67	67	79
320-66252-15	GAC-POST	39	38	38	37	37	36	38	47
LCS 320-428802/2-A	Lab Control Sample	109	112	112	110	106	101	119	123
LCSD 320-428802/3-A	Lab Control Sample Dup	97	101	102	103	100	93	113	103
MB 320-428802/1-A	Method Blank	93	97	101	97	95	97	100	113

		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)		
320-66252-1	ANG-TWP-02	91	101	94	83	87	82		
320-66252-2	ANG-TWP-01	103	115	103	88	90	92		
320-66252-4	OME-MW02-15	96	113	105	91	94	94		
320-66252-5	OME-MW03-15	91	104	98	76	83	82		
320-66252-6	AKA-TWP-01	113		109	100	110	100		
320-66252-6 - DL	AKA-TWP-01		101	97					
320-66252-7	OME-MW01-15	79	85	84	66	74	73		
320-66252-8	OME-MW01-30	82	84	85	70	70	71		
320-66252-9	EB-MW01-15	116	127	125	123	113	106		
320-66252-10	FB-MW02-15	111	111	106	107	102	94		
320-66252-11	GP-TWP-01	86	90	83	67	73	71		
320-66252-12	MW-6	107	112	111	91	96	97		
320-66252-13	MW-5	115	135	124	107	113	112		
320-66252-14	MW-D5-01	88	90	82	75	76	83		
320-66252-15	GAC-POST	36	39	39	37	37	40		
LCS 320-428802/2-A	Lab Control Sample	106	115	119	119	129	100		
LCSD 320-428802/3-A	Lab Control Sample Dup	101	105	103	110	118	94		
MB 320-428802/1-A	Method Blank	104	111	99	104	105	91		

Surrogate Legend

PFHxA = 13C2 PFHxA
C4PFHA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA
PFUnA = 13C2 PFUnA
PFDoA = 13C2 PFDoA
PFTDA = 13C2 PFTeDA
C3PFBS = 13C3 PFBS

Isotope Dilution Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

PFHxS = 18O2 PFHxS
PFOS = 13C4 PFOS
d3NMFOS = d3-NMeFOSAA
d5NEFOS = d5-NEtFOSAA
HFPODA = 13C3 HFPO-DA

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-428802/1-A
Matrix: Water
Analysis Batch: 429387

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 428802

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.58	ng/L		11/05/20 12:38	11/07/20 13:47	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.25	ng/L		11/05/20 12:38	11/07/20 13:47	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.85	ng/L		11/05/20 12:38	11/07/20 13:47	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.27	ng/L		11/05/20 12:38	11/07/20 13:47	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.31	ng/L		11/05/20 12:38	11/07/20 13:47	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		11/05/20 12:38	11/07/20 13:47	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.55	ng/L		11/05/20 12:38	11/07/20 13:47	1
Perfluorotridecanoic acid (PFTriA)	ND		2.0	1.3	ng/L		11/05/20 12:38	11/07/20 13:47	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.73	ng/L		11/05/20 12:38	11/07/20 13:47	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.20	ng/L		11/05/20 12:38	11/07/20 13:47	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.57	ng/L		11/05/20 12:38	11/07/20 13:47	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	0.54	ng/L		11/05/20 12:38	11/07/20 13:47	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		5.0	1.2	ng/L		11/05/20 12:38	11/07/20 13:47	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		5.0	1.3	ng/L		11/05/20 12:38	11/07/20 13:47	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		2.0	0.24	ng/L		11/05/20 12:38	11/07/20 13:47	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		4.0	1.5	ng/L		11/05/20 12:38	11/07/20 13:47	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		2.0	0.32	ng/L		11/05/20 12:38	11/07/20 13:47	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0	0.40	ng/L		11/05/20 12:38	11/07/20 13:47	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*93*		*25 - 150*	*11/05/20 12:38*	*11/07/20 13:47*	*1*
13C4 PFHpA	*97*		*25 - 150*	*11/05/20 12:38*	*11/07/20 13:47*	*1*
13C4 PFOA	*101*		*25 - 150*	*11/05/20 12:38*	*11/07/20 13:47*	*1*
13C5 PFNA	*97*		*25 - 150*	*11/05/20 12:38*	*11/07/20 13:47*	*1*
13C2 PFDA	*95*		*25 - 150*	*11/05/20 12:38*	*11/07/20 13:47*	*1*
13C2 PFUnA	*97*		*25 - 150*	*11/05/20 12:38*	*11/07/20 13:47*	*1*
13C2 PFDoA	*100*		*25 - 150*	*11/05/20 12:38*	*11/07/20 13:47*	*1*
13C2 PFTeDA	*113*		*25 - 150*	*11/05/20 12:38*	*11/07/20 13:47*	*1*
13C3 PFBS	*104*		*25 - 150*	*11/05/20 12:38*	*11/07/20 13:47*	*1*
18O2 PFHxS	*111*		*25 - 150*	*11/05/20 12:38*	*11/07/20 13:47*	*1*
13C4 PFOS	*99*		*25 - 150*	*11/05/20 12:38*	*11/07/20 13:47*	*1*
d3-NMeFOSAA	*104*		*25 - 150*	*11/05/20 12:38*	*11/07/20 13:47*	*1*
d5-NEtFOSAA	*105*		*25 - 150*	*11/05/20 12:38*	*11/07/20 13:47*	*1*
13C3 HFPO-DA	*91*		*25 - 150*	*11/05/20 12:38*	*11/07/20 13:47*	*1*

Lab Sample ID: LCS 320-428802/2-A
Matrix: Water
Analysis Batch: 429387

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 428802

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	40.0	37.1		ng/L		93	73 - 133
Perfluoroheptanoic acid (PFHpA)	40.0	34.9		ng/L		87	72 - 132
Perfluorooctanoic acid (PFOA)	40.0	33.2		ng/L		83	70 - 130
Perfluorononanoic acid (PFNA)	40.0	40.5		ng/L		101	75 - 135

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-428802/2-A
Matrix: Water
Analysis Batch: 429387

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 428802

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorodecanoic acid (PFDA)	40.0	36.6		ng/L		92	76 - 136
Perfluoroundecanoic acid (PFUnA)	40.0	35.9		ng/L		90	68 - 128
Perfluorododecanoic acid (PFDoA)	40.0	42.6		ng/L		107	71 - 131
Perfluorotridecanoic acid (PFTriA)	40.0	34.0		ng/L		85	71 - 131
Perfluorotetradecanoic acid (PFTeA)	40.0	33.6		ng/L		84	70 - 130
Perfluorobutanesulfonic acid (PFBS)	35.4	36.0		ng/L		102	67 - 127
Perfluorohexanesulfonic acid (PFHxS)	36.4	35.3		ng/L		97	59 - 119
Perfluorooctanesulfonic acid (PFOS)	37.1	40.9		ng/L		110	70 - 130
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	37.3	32.5		ng/L		87	75 - 135
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	40.0	36.7		ng/L		92	51 - 173
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	37.7	33.8		ng/L		90	54 - 114
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	37.7	34.7		ng/L		92	79 - 139

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*109*		*25 - 150*
13C4 PFHpA	*112*		*25 - 150*
13C4 PFOA	*112*		*25 - 150*
13C5 PFNA	*110*		*25 - 150*
13C2 PFDA	*106*		*25 - 150*
13C2 PFUnA	*101*		*25 - 150*
13C2 PFDoA	*119*		*25 - 150*
13C2 PFTeDA	*123*		*25 - 150*
13C3 PFBS	*106*		*25 - 150*
18O2 PFHxS	*115*		*25 - 150*
13C4 PFOS	*119*		*25 - 150*
d3-NMeFOSAA	*119*		*25 - 150*
d5-NEtFOSAA	*129*		*25 - 150*
13C3 HFPO-DA	*100*		*25 - 150*

Lab Sample ID: LCSD 320-428802/3-A
Matrix: Water
Analysis Batch: 429387

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 428802

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	40.0	41.2		ng/L		103	73 - 133	10	30
Perfluoroheptanoic acid (PFHpA)	40.0	41.7		ng/L		104	72 - 132	18	30
Perfluorooctanoic acid (PFOA)	40.0	40.2		ng/L		101	70 - 130	19	30
Perfluorononanoic acid (PFNA)	40.0	42.1		ng/L		105	75 - 135	4	30
Perfluorodecanoic acid (PFDA)	40.0	39.3		ng/L		98	76 - 136	7	30
Perfluoroundecanoic acid (PFUnA)	40.0	45.7		ng/L		114	68 - 128	24	30

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCSD 320-428802/3-A
Matrix: Water
Analysis Batch: 429387

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 428802

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorododecanoic acid (PFDoA)			40.0	50.7		ng/L		127	71 - 131	17	30
Perfluorotridecanoic acid (PFTriA)			40.0	44.1		ng/L		110	71 - 131	26	30
Perfluorotetradecanoic acid (PFTeA)			40.0	50.6	*1	ng/L		127	70 - 130	41	30
Perfluorobutanesulfonic acid (PFBS)			35.4	38.8		ng/L		110	67 - 127	7	30
Perfluorohexanesulfonic acid (PFHxS)			36.4	37.7		ng/L		104	59 - 119	7	30
Perfluorooctanesulfonic acid (PFOS)			37.1	38.7		ng/L		104	70 - 130	6	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid			37.3	40.7		ng/L		109	75 - 135	22	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)			40.0	42.0		ng/L		105	51 - 173	13	30
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid			37.7	41.1		ng/L		109	54 - 114	19	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)			37.7	42.1		ng/L		112	79 - 139	19	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C2 PFHxA	*97*		*25 - 150*
13C4 PFHpA	*101*		*25 - 150*
13C4 PFOA	*102*		*25 - 150*
13C5 PFNA	*103*		*25 - 150*
13C2 PFDA	*100*		*25 - 150*
13C2 PFUnA	*93*		*25 - 150*
13C2 PFDoA	*113*		*25 - 150*
13C2 PFTeDA	*103*		*25 - 150*
13C3 PFBS	*101*		*25 - 150*
18O2 PFHxS	*105*		*25 - 150*
13C4 PFOS	*103*		*25 - 150*
d3-NMeFOSAA	*110*		*25 - 150*
d5-NEtFOSAA	*118*		*25 - 150*
13C3 HFPO-DA	*94*		*25 - 150*

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Lab Sample ID: MB 320-428484/1-A
Matrix: Water
Analysis Batch: 428577

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 428484

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:20	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:20	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:20	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:20	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:20	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:20	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:20	1
Perfluorotridecanoic acid (PFTriA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:20	1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: MB 320-428484/1-A
Matrix: Water
Analysis Batch: 428577

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 428484

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:20	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:20	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:20	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:20	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:20	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:20	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:20	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:20	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:20	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		2.0	0.50	ng/L		11/04/20 21:24	11/05/20 09:20	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*90*		*70 - 130*	*11/04/20 21:24*	*11/05/20 09:20*	*1*
13C2 PFDA	*90*		*70 - 130*	*11/04/20 21:24*	*11/05/20 09:20*	*1*
d5-NEtFOSAA	*90*		*70 - 130*	*11/04/20 21:24*	*11/05/20 09:20*	*1*
13C3 HFPO-DA	*88*		*70 - 130*	*11/04/20 21:24*	*11/05/20 09:20*	*1*

Lab Sample ID: LLCS 320-428484/2-A
Matrix: Water
Analysis Batch: 428577

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 428484

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	4.00	3.26		ng/L		82	50 - 150
Perfluoroheptanoic acid (PFHpA)	4.00	3.25		ng/L		81	50 - 150
Perfluorooctanoic acid (PFOA)	4.00	3.54		ng/L		88	50 - 150
Perfluorononanoic acid (PFNA)	4.00	3.49		ng/L		87	50 - 150
Perfluorodecanoic acid (PFDA)	4.00	3.26		ng/L		82	50 - 150
Perfluoroundecanoic acid (PFUnA)	4.00	3.15		ng/L		79	50 - 150
Perfluorododecanoic acid (PFDoA)	4.00	3.18		ng/L		80	50 - 150
Perfluorotridecanoic acid (PFTriA)	4.00	3.33		ng/L		83	50 - 150
Perfluorotetradecanoic acid (PFTeA)	4.00	3.47		ng/L		87	50 - 150
Perfluorobutanesulfonic acid (PFBS)	3.54	2.98		ng/L		84	50 - 150
Perfluorohexanesulfonic acid (PFHxS)	3.64	3.28		ng/L		90	50 - 150
Perfluorooctanesulfonic acid (PFOS)	3.71	3.21		ng/L		87	50 - 150
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	4.00	3.29		ng/L		82	50 - 150
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	4.00	3.32		ng/L		83	50 - 150

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: LLCS 320-428484/2-A
Matrix: Water
Analysis Batch: 428577

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 428484

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	3.73	3.18		ng/L		85	50 - 150
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	3.77	3.36		ng/L		89	50 - 150
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	4.00	3.35		ng/L		84	50 - 150
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	3.77	3.18		ng/L		84	50 - 150

Surrogate	*LLCS %Recovery*	*LLCS Qualifier*	*Limits*
13C2 PFHxA	*92*		*70 - 130*
13C2 PFDA	*90*		*70 - 130*
d5-NEtFOSAA	*89*		*70 - 130*
13C3 HFPO-DA	*86*		*70 - 130*

Lab Sample ID: LLCSD 320-428484/3-A
Matrix: Water
Analysis Batch: 428577

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 428484

Analyte	Spike Added	LLCSD Result	LLCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	4.00	3.36		ng/L		84	50 - 150	3	50
Perfluoroheptanoic acid (PFHpA)	4.00	3.36		ng/L		84	50 - 150	3	50
Perfluorooctanoic acid (PFOA)	4.00	3.20		ng/L		80	50 - 150	10	50
Perfluorononanoic acid (PFNA)	4.00	3.36		ng/L		84	50 - 150	4	50
Perfluorodecanoic acid (PFDA)	4.00	3.19		ng/L		80	50 - 150	2	50
Perfluoroundecanoic acid (PFUnA)	4.00	3.26		ng/L		82	50 - 150	4	50
Perfluorododecanoic acid (PFDoA)	4.00	3.13		ng/L		78	50 - 150	1	50
Perfluorotridecanoic acid (PFTriA)	4.00	3.23		ng/L		81	50 - 150	3	50
Perfluorotetradecanoic acid (PFTeA)	4.00	3.47		ng/L		87	50 - 150	0.05	50
Perfluorobutanesulfonic acid (PFBS)	3.54	2.85		ng/L		81	50 - 150	5	50
Perfluorohexanesulfonic acid (PFHxS)	3.64	3.08		ng/L		85	50 - 150	6	50
Perfluorooctanesulfonic acid (PFOS)	3.71	3.18		ng/L		86	50 - 150	0.9	50
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	4.00	2.93		ng/L		73	50 - 150	11	50
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	4.00	3.24		ng/L		81	50 - 150	3	50
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	3.73	3.11		ng/L		83	50 - 150	3	50
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	3.77	3.15		ng/L		84	50 - 150	7	50
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	4.00	3.50		ng/L		88	50 - 150	4	50
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	3.77	3.37		ng/L		89	50 - 150	6	50

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: LLCSD 320-428484/3-A
Matrix: Water
Analysis Batch: 428577

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 428484

Surrogate	LLCSD %Recovery	LLCSD Qualifier	Limits
13C2 PFHxA	92		70 - 130
13C2 PFDA	87		70 - 130
d5-NEtFOSAA	86		70 - 130
13C3 HFPO-DA	88		70 - 130

LCMS

Prep Batch: 428484

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66252-3	PW-181	Total/NA	Water	537.1 DW	
MB 320-428484/1-A	Method Blank	Total/NA	Water	537.1 DW	
LLCS 320-428484/2-A	Lab Control Sample	Total/NA	Water	537.1 DW	
LLCSD 320-428484/3-A	Lab Control Sample Dup	Total/NA	Water	537.1 DW	

Analysis Batch: 428577

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66252-3	PW-181	Total/NA	Water	537.1 DW	428484
MB 320-428484/1-A	Method Blank	Total/NA	Water	537.1 DW	428484
LLCS 320-428484/2-A	Lab Control Sample	Total/NA	Water	537.1 DW	428484
LLCSD 320-428484/3-A	Lab Control Sample Dup	Total/NA	Water	537.1 DW	428484

Prep Batch: 428802

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66252-1	ANG-TWP-02	Total/NA	Water	3535	
320-66252-2	ANG-TWP-01	Total/NA	Water	3535	
320-66252-4	OME-MW02-15	Total/NA	Water	3535	
320-66252-5	OME-MW03-15	Total/NA	Water	3535	
320-66252-6 - DL	AKA-TWP-01	Total/NA	Water	3535	
320-66252-6	AKA-TWP-01	Total/NA	Water	3535	
320-66252-7	OME-MW01-15	Total/NA	Water	3535	
320-66252-8	OME-MW01-30	Total/NA	Water	3535	
320-66252-9	EB-MW01-15	Total/NA	Water	3535	
320-66252-10	FB-MW02-15	Total/NA	Water	3535	
320-66252-11	GP-TWP-01	Total/NA	Water	3535	
320-66252-12	MW-6	Total/NA	Water	3535	
320-66252-13	MW-5	Total/NA	Water	3535	
320-66252-14	MW-D5-01	Total/NA	Water	3535	
320-66252-15	GAC-POST	Total/NA	Water	3535	
MB 320-428802/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-428802/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-428802/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 429387

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66252-1	ANG-TWP-02	Total/NA	Water	537 (modified)	428802
320-66252-2	ANG-TWP-01	Total/NA	Water	537 (modified)	428802
320-66252-4	OME-MW02-15	Total/NA	Water	537 (modified)	428802
320-66252-5	OME-MW03-15	Total/NA	Water	537 (modified)	428802
320-66252-6	AKA-TWP-01	Total/NA	Water	537 (modified)	428802
320-66252-7	OME-MW01-15	Total/NA	Water	537 (modified)	428802
320-66252-8	OME-MW01-30	Total/NA	Water	537 (modified)	428802
320-66252-9	EB-MW01-15	Total/NA	Water	537 (modified)	428802
320-66252-10	FB-MW02-15	Total/NA	Water	537 (modified)	428802
320-66252-11	GP-TWP-01	Total/NA	Water	537 (modified)	428802
320-66252-12	MW-6	Total/NA	Water	537 (modified)	428802
320-66252-13	MW-5	Total/NA	Water	537 (modified)	428802
320-66252-14	MW-D5-01	Total/NA	Water	537 (modified)	428802
320-66252-15	GAC-POST	Total/NA	Water	537 (modified)	428802
MB 320-428802/1-A	Method Blank	Total/NA	Water	537 (modified)	428802
LCS 320-428802/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	428802

LCMS (Continued)

Analysis Batch: 429387 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 320-428802/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	428802

Analysis Batch: 429691

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-66252-6 - DL	AKA-TWP-01	Total/NA	Water	537 (modified)	428802

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

Client Sample ID: ANG-TWP-02
Date Collected: 10/27/20 18:12
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66252-1
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			274.6 mL	10.0 mL	428802	11/05/20 12:38	EH	TAL SAC
Total/NA	Analysis	537 (modified)		1			429387	11/07/20 14:15	K1S	TAL SAC

Client Sample ID: ANG-TWP-01
Date Collected: 10/27/20 18:02
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66252-2
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			262.6 mL	10.0 mL	428802	11/05/20 12:38	EH	TAL SAC
Total/NA	Analysis	537 (modified)		1			429387	11/07/20 14:24	K1S	TAL SAC

Client Sample ID: PW-181
Date Collected: 10/28/20 19:33
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66252-3
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	537.1 DW			247.8 mL	1.00 mL	428484	11/04/20 21:24	JER	TAL SAC
Total/NA	Analysis	537.1 DW		1			428577	11/05/20 09:27	SK	TAL SAC

Client Sample ID: OME-MW02-15
Date Collected: 10/31/20 12:30
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66252-4
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			257.2 mL	10.0 mL	428802	11/05/20 12:38	EH	TAL SAC
Total/NA	Analysis	537 (modified)		1			429387	11/07/20 14:33	K1S	TAL SAC

Client Sample ID: OME-MW03-15
Date Collected: 10/31/20 12:40
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66252-5
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			270.3 mL	10.0 mL	428802	11/05/20 12:38	EH	TAL SAC
Total/NA	Analysis	537 (modified)		1			429387	11/07/20 14:42	K1S	TAL SAC

Client Sample ID: AKA-TWP-01
Date Collected: 10/31/20 15:04
Date Received: 11/03/20 12:10

Lab Sample ID: 320-66252-6
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	DL		260 mL	10.0 mL	428802	11/05/20 12:38	EH	TAL SAC
Total/NA	Analysis	537 (modified)	DL	100			429691	11/08/20 19:50	S1M	TAL SAC
Total/NA	Prep	3535			260 mL	10.0 mL	428802	11/05/20 12:38	EH	TAL SAC
Total/NA	Analysis	537 (modified)		1			429387	11/07/20 14:51	K1S	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

Client Sample ID: OME-MW01-15
Lab Sample ID: 320-66252-7
Date Collected: 10/31/20 17:35
Matrix: Water
Date Received: 11/03/20 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			288.4 mL	10.0 mL	428802	11/05/20 12:38	EH	TAL SAC
Total/NA	Analysis	537 (modified)		1			429387	11/07/20 15:00	K1S	TAL SAC

Client Sample ID: OME-MW01-30
Lab Sample ID: 320-66252-8
Date Collected: 10/31/20 16:40
Matrix: Water
Date Received: 11/03/20 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			295.1 mL	10.0 mL	428802	11/05/20 12:38	EH	TAL SAC
Total/NA	Analysis	537 (modified)		1			429387	11/07/20 15:09	K1S	TAL SAC

Client Sample ID: EB-MW01-15
Lab Sample ID: 320-66252-9
Date Collected: 10/31/20 18:00
Matrix: Water
Date Received: 11/03/20 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			251.8 mL	10.0 mL	428802	11/05/20 12:38	EH	TAL SAC
Total/NA	Analysis	537 (modified)		1			429387	11/07/20 15:37	K1S	TAL SAC

Client Sample ID: FB-MW02-15
Lab Sample ID: 320-66252-10
Date Collected: 10/31/20 12:45
Matrix: Water
Date Received: 11/03/20 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			289.6 mL	10.0 mL	428802	11/05/20 12:38	EH	TAL SAC
Total/NA	Analysis	537 (modified)		1			429387	11/07/20 15:46	K1S	TAL SAC

Client Sample ID: GP-TWP-01
Lab Sample ID: 320-66252-11
Date Collected: 10/27/20 21:16
Matrix: Water
Date Received: 11/03/20 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			260.1 mL	10.0 mL	428802	11/05/20 12:38	EH	TAL SAC
Total/NA	Analysis	537 (modified)		1			429387	11/07/20 15:55	K1S	TAL SAC

Client Sample ID: MW-6
Lab Sample ID: 320-66252-12
Date Collected: 10/28/20 15:05
Matrix: Water
Date Received: 11/03/20 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			290.3 mL	10.0 mL	428802	11/05/20 12:38	EH	TAL SAC
Total/NA	Analysis	537 (modified)		1			429387	11/07/20 16:04	K1S	TAL SAC

Lab Chronicle

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

Client Sample ID: MW-5

Lab Sample ID: 320-66252-13

Date Collected: 10/28/20 15:15

Matrix: Water

Date Received: 11/03/20 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			291.9 mL	10.0 mL	428802	11/05/20 12:38	EH	TAL SAC
Total/NA	Analysis	537 (modified)		1			429387	11/07/20 16:13	K1S	TAL SAC

Client Sample ID: MW-D5-01

Lab Sample ID: 320-66252-14

Date Collected: 10/28/20 20:48

Matrix: Water

Date Received: 11/03/20 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			253.4 mL	10.0 mL	428802	11/05/20 12:38	EH	TAL SAC
Total/NA	Analysis	537 (modified)		1			429387	11/07/20 16:22	K1S	TAL SAC

Client Sample ID: GAC-POST

Lab Sample ID: 320-66252-15

Date Collected: 11/01/20 16:00

Matrix: Water

Date Received: 11/03/20 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			270.2 mL	10.0 mL	428802	11/05/20 12:38	EH	TAL SAC
Total/NA	Analysis	537 (modified)		1			429387	11/07/20 16:32	K1S	TAL SAC

Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

Laboratory: Eurofins TestAmerica, Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	01-20-21
ANAB	Dept. of Defense ELAP	L2468	01-20-21
ANAB	Dept. of Energy	L2468.01	01-20-21
ANAB	ISO/IEC 17025	L2468	01-20-21
Arizona	State	AZ0708	08-11-21
Arkansas DEQ	State	88-0691	06-17-21
California	State	2897	01-31-22
Colorado	State	CA0004	08-31-21
Connecticut	State	PH-0691	06-30-21
Florida	NELAP	E87570	06-30-21
Georgia	State	4040	01-30-21
Hawaii	State	<cert No.>	01-29-21
Illinois	NELAP	200060	03-17-21
Kansas	NELAP	E-10375	10-31-20 *
Louisiana	NELAP	01944	06-30-21
Maine	State	CA00004	04-14-22
Michigan	State	9947	08-03-23
Nevada	State	CA000442021-1	07-31-21
New Hampshire	NELAP	2997	04-18-21
New Jersey	NELAP	CA005	06-30-21
New York	NELAP	11666	04-01-21
Oregon	NELAP	4040	01-29-21
Pennsylvania	NELAP	68-01272	03-31-21
Texas	NELAP	T104704399-19-13	06-01-21
US Fish & Wildlife	US Federal Programs	58448	07-31-21
USDA	US Federal Programs	P330-18-00239	07-31-21
Utah	NELAP	CA000442019-01	02-28-21
Vermont	State	VT-4040	04-16-21
Virginia	NELAP	460278	03-14-21
Washington	State	C581	05-05-21
West Virginia (DW)	State	9930C	12-31-20
Wisconsin	State	998204680	08-31-21
Wyoming	State Program	8TMS-L	01-28-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
537.1 DW	Perfluorinated Alkyl Acids (LC/MS)	EPA	TAL SAC
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC
537.1 DW	Extraction of Perfluorinated Alkyl Acids	EPA	TAL 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:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Shannon & Wilson, Inc
Project/Site: Nome DOT&PF

Job ID: 320-66252-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
320-66252-1	ANG-TWP-02	Water	10/27/20 18:12	11/03/20 12:10	
320-66252-2	ANG-TWP-01	Water	10/27/20 18:02	11/03/20 12:10	
320-66252-3	PW-181	Water	10/28/20 19:33	11/03/20 12:10	
320-66252-4	OME-MW02-15	Water	10/31/20 12:30	11/03/20 12:10	
320-66252-5	OME-MW03-15	Water	10/31/20 12:40	11/03/20 12:10	
320-66252-6	AKA-TWP-01	Water	10/31/20 15:04	11/03/20 12:10	
320-66252-7	OME-MW01-15	Water	10/31/20 17:35	11/03/20 12:10	
320-66252-8	OME-MW01-30	Water	10/31/20 16:40	11/03/20 12:10	
320-66252-9	EB-MW01-15	Water	10/31/20 18:00	11/03/20 12:10	
320-66252-10	FB-MW02-15	Water	10/31/20 12:45	11/03/20 12:10	
320-66252-11	GP-TWP-01	Water	10/27/20 21:16	11/03/20 12:10	
320-66252-12	MW-6	Water	10/28/20 15:05	11/03/20 12:10	
320-66252-13	MW-5	Water	10/28/20 15:15	11/03/20 12:10	
320-66252-14	MW-D5-01	Water	10/28/20 20:48	11/03/20 12:10	
320-66252-15	GAC-POST	Water	11/01/20 16:00	11/03/20 12:10	

320-66252 Chain of Custody

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN-OF-CUSTODY RECORD

Laboratory Test America
Attn: David Althoff

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600

2255 S.W. Canyon Road
Portland, OR 97201-2498
(503) 223-6147

2043 Westport Center Drive
St. Louis, MO 63146-3564
(314) 699-9660

5430 Fairbanks Street, Suite 3
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(907) 561-2120

1200 17th Street, Suite 1024
Denver, Co 80202
(303) 825-3800

303 Wellsian Way
Richland, WA 99352
(509) 946-6309

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	PFAS x18 (537.1 (M))	PFAS x18 (537.1)					Total Number of Containers	Remarks/Matrix
ANG-TWP-02		1812	10/27/20		X	X						2	groundwater
ANG-TWP-01		1802	↓		X	X						2	↓
PW-181		1933	10/28/20				X					2	GW used as drinking water
OME-MW02-15		1230	10/31/20		X	X						2	groundwater
OME-MW03-15		1240			X	X						2	
AKA-TWP-01		1504			X	X						2	
OME-MW01-15		1735			X	X						2	
OME-MW01-30		~~1805~~ 1640			X	X						2	↓
EB-MW01-15		1800			X	X						2	Equipt blank
FB-MW02-15		1245	↓		X	X						2	Field blank

Project Information		Sample Receipt	
Project Number:	105745	Total Number of Containers	28
Project Name:	None 537.1PF	COC Seals/Intact? Y/N/NA	
Contact:	MDN	Received Good Cond./Cold	
Ongoing Project?	Yes ☒ No ☐	Delivery Method:	Goldstreak
Sampler:	APW/KTY/MDN	(attach shipping bill, if any)	

Instructions	
Requested Turnaround Time:	Standard
Special Instructions:	Please bill to 105745-002

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: [signature] Time: 1600	Signature: Time:	Signature: Time:
Printed Name: Marcy Nobel Date: 11/4/20	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: [signature] Time: 1210	Signature: Time:	Signature: Time:
Printed Name: David Hoff Date: 11/3/20	Printed Name: Date:	Printed Name: Date:
Company: ETA	Company:	Company:

F-19-91/UR

4-2c

No. 30000

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CHAIN-OF-CUSTODY RECORD

Laboratory Test America
Attn: David Althacker

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	PFAS x18 (537.1 M)						Total Number of Containers	Remarks/Matrix
GP-TWP-01		21:16	10/27/20		X	X						2	groundwater
MW-6		15:05	10/28/20		X	X						2	
MW-5		15:15			X	X						2	
MW-D5-01		20:48			X	X						2	
GAC-POST		16:00	11/1/20		X	X						2	water

Project Information	Sample Receipt
Project Number:	Total Number of Containers
Project Name:	COC Seals/Intact? Y/N/NA
Contact:	Received Good Cond./Cold
Ongoing Project? Yes ☐ No ☑	Delivery Method:
Sampler:	(attach shipping bill, if any)

Instructions
Requested Turnaround Time:
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: M. Nadel Time: 1500 1600	Signature: Time:	Signature: Time:
Printed Name: Marcy Nadel Date: 11/1/20	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 12:10	Signature: Time:	Signature: Time:
Printed Name: Date: 11/8/20	Printed Name: Date:	Printed Name: Date:
Company: ETA	Company:	Company:

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

F-19-91/UR

No. 30000

Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 320-66252-1

Login Number: 66252
List Number: 1
Creator: Her, David A

List Source: Eurofins TestAmerica, Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	SEALS
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 <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Laboratory Data Review Checklist

Completed By:

Marcy Nadel

Title:

Geologist

Date:

November 13, 2020

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

Eurofins TestAmerica, Sacramento

Laboratory Report Number:

320-66252-1

Laboratory Report Date:

November 12, 2020

CS Site Name:

Nome Airport PFAS

ADEC File Number:

400.38.056

Hazard Identification Number:

27154

320-66252-1

Laboratory Report Date:

November 12, 2020

CS Site Name:

Nome Airport PFAS

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☒ No☐ N/A☐ Comments:

   The ADEC certified the TestAmerica/Eurofins Laboratories West Sacramento, CA location for the analysis of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) on February 6, 2018. These compounds were included in the ADEC's Contaminated Sites Laboratory Approval 17-020.

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☐ No☐ N/A☒ Comments:

   All analyses were performed by TestAmerica Laboratories, Inc. in West Sacramento, CA.

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:

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 blank was measured within the acceptable temperature range of 0 °C to 6 °C upon arrival at the laboratory. The temperature of the sample cooler upon receipt was 4.2°C.

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Nome Airport PFAS

b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

Yes☒ No☐ N/A☐ Comments:

Sample *PW-181* was preserved using Trizma. The other water samples in this work order were not preserved. Analysis of PFAS compounds in groundwater and surface water does not require chemical preservation.

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes☒ No☐ N/A☐ Comments:

The sample receipt form notes 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:

There were no discrepancies noted in the sample receipt documentation.

e. Data quality or usability affected?

Comments:

Data quality and/or usability are not affected; see above.

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 case narrative notes that the relative precision demonstrated between the perfluorotetradecanoic acid (PFTeA) recoveries of the laboratory control sample (LCS) and LCS duplicate (LCSD) associated with preparation batch 320-428802 was outside of acceptance criteria.

The results for sample *AKA-TWP-01* were reported from a diluted extract due to high analyte concentrations and matrix interferences.

Samples *ANG-TWP-02*, *ANG-TWP-01*, *AKA-TWP-01*, *OME-MW01-15*, *OME-MW01-30*, *GP-TWP-01*, *MW-6*, and *MW-5* were observed to be yellow to orange in hue prior to extraction.

Samples *ANG-TWP-02*, *ANG-TWP-01*, *OME-MW02-15*, *OME-MW03-15*, *AKA-TWP-01*, *OME-MW01-15*, *OME-MW01-30*, *GP-TWP-01*, *MW-6*, *MW-5*, *MW-D5-01*, and *GAC-POST* were noted to contain a thin layer of sediment at the bottom of the sample container.

Samples *MW-D5-01* and *GAC-POST* were observed to be gray in color prior to extraction.

Sample *PW-181* was observed to be turbid with a reddish-brown hue and trace sediment prior to extraction. The sample extract maintained that reddish-brown hue and was opaque.

Samples *ANG-TWP-02*, *ANG-TWP-01*, *OME-MW02-15*, *OME-MW03-15*, *OME-MW01-15*, *OME-MW01-30*, *GP-TWP-01*, *MW-D5-01*, and *GAC-POST* contained non-settable particulates which clogged the solid phase extraction column.

There was insufficient sample volume available to perform a matrix spike (MS) and MS duplicate (MSD) in conjunction with preparation batches 320-428802 and 320-428484.

c. Were all corrective actions documented?

Yes☒ No☐ N/A☐ Comments:

Sample *AKA-TWP-01* was diluted to bring the concentrations of target analytes within the instrument's calibration range and to control the effects of matrix interference. A dilution factor was applied to the IDA recovery calculations.

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

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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:

The samples were extracted within 14 days of collection and analyzed within 40 days, meeting the hold times required by EPA Method 537.1 and 537M.

c. All soils reported on a dry weight basis?

Yes☐ No☐ N/A☒ Comments:

This work order does not include soil samples.

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☒ No☐ N/A☐ Comments:

The LOQ, equivalent to the TestAmerica Reporting Limit (RL), is less than the applicable DEC regulatory limits for drinking water samples for non-detected results. The RLs for one sample do not meet applicable limits because the sample was diluted 100-fold prior to analysis.

e. Data quality or usability affected?

The data quality and/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:

The method blanks are reported for EPA methods 537.1 and 537M.

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ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

Target analytes were not detected in the method blank samples.

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

None; target analytes were not detected 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:

No samples are affected; therefore, qualification is not required.

v. Data quality or usability affected?

Comments:

The data quality and/or usability are not affected.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

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:

Metals and/or inorganics were not analyzed as part of this work order.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

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. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☐ No☒ N/A☐ Comments:

The RPD between the perfluorotetradecanoic acid (PFTeA) recoveries of the LCS/LCSD associated with preparation batch 320-428802 did not meet acceptance criteria.

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

Preparation batch 320-428802 contains all field samples associated with this work order except *PW-181*. The PFTeA results of the included samples are considered estimated due to the imprecision.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☒ No☐ N/A☐ Comments:

The PFTeA results of all samples included in this work order except PW-181 are considered estimated. These non-detect results are flagged 'UJ' to identify the possible method imprecision.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality for PFTeA may be affected; see above.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

Sufficient volume was not available to complete an MS/MSD for the project sample set. Analytical precision and accuracy were evaluated using the LCS/LCSD samples.

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

Metals and/or inorganics were not analyzed as part of this work order.

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CS Site Name:

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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 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:

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and/or 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:

EPA methods 537.1 and 537M use IDA, which entails adding 13C-isotopes of certain target analytes to assess recovery.

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:

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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:

There were no IDA recovery failures associated with this work order.

iv. Data quality or usability affected?

Comments:

The data quality and/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; 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? (If not, a comment explaining why must be entered below)

Yes☐ No☐ N/A☒ Comments:

iii. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

None; a trip blank was not submitted with this work order.

v. Data quality or usability affected?

Comments:

The data quality and/or usability are not affected; see above.

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f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☒ No☐ N/A☐ Comments:

Three field-duplicate samples were submitted with this work order.

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

The field-duplicate pairs were named *ANG-TWP-01* / *ANG-TWP-02*, *OME-MW02-15* / *OME-MW03-15*, and *MW-5* / *MW-6*.

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 relative precision demonstrated between the detected results of the field duplicate samples was within the DQO of 30% for all analytes.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

The data quality and/or usability are not affected; see above.

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☒ No☐ N/A☐ Comments:

Samples *OME-MW02-15* / *OME-MW03-15*, *OME-MW01-15*, *OME-MW01-30*, and *MW-5* / *MW-6* were collected using a reusable, submersible pump. The equipment blank sample *EB-MW01-15* was collected from this pump.

The other samples in this work order were not collected using reusable equipment.

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i. All results less than LOQ and project specified objectives?

Yes☒ No☐ N/A☐ Comments:

Target analytes were not detected in the equipment blank sample.

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

N/A; no samples are affected.

iii. Data quality or usability affected?

Comments:

The data quality and/or 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:

Field blank sample *FB-MW02-15* was collected at a likely PFAS source area. Project analytes were not detected in the equipment blank sample.

There were no additional flags/qualifiers required for this work order.

Laboratory Report of Analysis

To: Shannon & Wilson-Fairbanks
2355 Hill Rd
Fairbanks, AK 99707
(907)479-0600

Report Number: **1206052**

Client Project: **105745 DOT&PF Nome**

Dear Marcy Nadel,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Jennifer at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Stephen C. Ede
2020.12.02
08:05:44 -09'00'

Jennifer Dawkins Date
Project Manager
Jennifer.Dawkins@sgs.com

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Case Narrative

SGS Client: **Shannon & Wilson-Fairbanks**
SGS Project: **1206052**
Project Name/Site: **105745 DOT&PF Nome**
Project Contact: **Marcy Nadel**

Refer to sample receipt form for information on sample condition.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
8270D SIM (PAH)				
1206052011	SS-12	XMS12422	Benzo[k]fluoranthene	RP

Manual Integration Reason Code Descriptions

Code	Description
O	Original Chromatogram
M	Modified Chromatogram
SS	Skimmed surrogate
BLG	Closed baseline gap
RP	Reassign peak name
PIR	Pattern integration required
IT	Included tail
SP	Split peak
RSP	Removed split peak
FPS	Forced peak start/stop
BLC	Baseline correction
PNF	Peak not found by software

All DRO/RRO analysis are integrated per SOP.

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. The results apply to the samples as received. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020B, 7470A, 7471B, 8015C, 8021B, 8082A, 8260D, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
TNTC	Too Numerous To Count
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
ARFF-SB1-03	1206052001	10/24/2020	11/02/2020	Soil/Solid (dry weight)
ARFF-SB2-03	1206052002	10/24/2020	11/02/2020	Soil/Solid (dry weight)
10-28-SB4-03	1206052003	10/25/2020	11/02/2020	Soil/Solid (dry weight)
ARFF-SB3-03	1206052004	10/26/2020	11/02/2020	Soil/Solid (dry weight)
ARFF-SB3-13	1206052005	10/26/2020	11/02/2020	Soil/Solid (dry weight)
ARFF-SB4-03	1206052006	10/26/2020	11/02/2020	Soil/Solid (dry weight)
SS-08	1206052007	10/29/2020	11/02/2020	Soil/Solid (dry weight)
SS-09	1206052008	10/29/2020	11/02/2020	Soil/Solid (dry weight)
SS-10	1206052009	10/29/2020	11/02/2020	Soil/Solid (dry weight)
SS-11	1206052010	10/29/2020	11/02/2020	Soil/Solid (dry weight)
SS-12	1206052011	10/29/2020	11/02/2020	Soil/Solid (dry weight)
SS-13	1206052012	10/29/2020	11/02/2020	Soil/Solid (dry weight)
SS-14	1206052013	10/29/2020	11/02/2020	Soil/Solid (dry weight)
SS-15	1206052014	10/29/2020	11/02/2020	Soil/Solid (dry weight)
SS-16	1206052015	10/29/2020	11/02/2020	Soil/Solid (dry weight)
SS-17	1206052016	10/29/2020	11/02/2020	Soil/Solid (dry weight)
TB2/PW7-30-5	1206052017	10/29/2020	11/02/2020	Soil/Solid (dry weight)
TB1/PW7-30-8	1206052018	10/24/2020	11/02/2020	Soil/Solid (dry weight)

Method	Method Description
8270D SIM (PAH)	8270 PAH SIM Semi-Volatiles GC/MS
AK102	Diesel/Residual Range Organics
AK103	Diesel/Residual Range Organics
AK101	Gasoline Range Organics (S)
SM21 2540G	Percent Solids SM2540G
SW8260D	Volatile Organic Compounds (S) FIELD EXT

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Detectable Results Summary

Client Sample ID: **ARFF-SB1-03**
Lab Sample ID: 1206052001

Parameter	Result	Units
Semivolatile Organic Fuels		
Diesel Range Organics	14.8J	mg/kg
Volatile Fuels		
Gasoline Range Organics	1.33J	mg/kg

Client Sample ID: **ARFF-SB2-03**
Lab Sample ID: 1206052002

Parameter	Result	Units
Semivolatile Organic Fuels		
Diesel Range Organics	19.7J	mg/kg
Residual Range Organics	112J	mg/kg
Volatile Fuels		
Gasoline Range Organics	1.54J	mg/kg

Client Sample ID: **10-28-SB4-03**
Lab Sample ID: 1206052003

Parameter	Result	Units
Semivolatile Organic Fuels		
Diesel Range Organics	23.1J	mg/kg
Residual Range Organics	250	mg/kg
Volatile Fuels		
Gasoline Range Organics	2.51J	mg/kg

Client Sample ID: **ARFF-SB3-03**
Lab Sample ID: 1206052004

Parameter	Result	Units
Semivolatile Organic Fuels		
Diesel Range Organics	14.1J	mg/kg
Volatile Fuels		
Gasoline Range Organics	1.72J	mg/kg

Client Sample ID: **ARFF-SB3-13**
Lab Sample ID: 1206052005

Parameter	Result	Units
Semivolatile Organic Fuels		
Diesel Range Organics	14.1J	mg/kg
Volatile Fuels		
Gasoline Range Organics	1.62J	mg/kg

Client Sample ID: **ARFF-SB4-03**
Lab Sample ID: 1206052006

Parameter	Result	Units
Semivolatile Organic Fuels		
Diesel Range Organics	11.9J	mg/kg
Volatile Fuels		
Gasoline Range Organics	1.55J	mg/kg

Client Sample ID: **SS-08**
Lab Sample ID: 1206052007

Parameter	Result	Units
Semivolatile Organic Fuels		
Diesel Range Organics	23.7J	mg/kg
Residual Range Organics	304	mg/kg
Volatile Fuels		
Gasoline Range Organics	1.65J	mg/kg

Client Sample ID: **SS-09**
Lab Sample ID: 1206052008

Parameter	Result	Units
Semivolatile Organic Fuels		
Diesel Range Organics	23.3	mg/kg
Residual Range Organics	200	mg/kg
Volatile Fuels		
Gasoline Range Organics	1.11J	mg/kg

Client Sample ID: **SS-10**
Lab Sample ID: 1206052009

Parameter	Result	Units
Semivolatile Organic Fuels		
Diesel Range Organics	303	mg/kg
Residual Range Organics	4350	mg/kg
Volatile Fuels		
Gasoline Range Organics	2.08J	mg/kg

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Detectable Results Summary

Client Sample ID: **SS-11**
Lab Sample ID: 1206052010

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	360	mg/kg
	Residual Range Organics	4350	mg/kg
Volatile Fuels	Gasoline Range Organics	2.24J	mg/kg

Client Sample ID: **SS-12**
Lab Sample ID: 1206052011

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	Acenaphthene	0.0392J	mg/kg
	Anthracene	0.0781J	mg/kg
	Benzo(a)Anthracene	0.392	mg/kg
	Benzo[a]pyrene	0.217	mg/kg
	Benzo[b]Fluoranthene	0.365	mg/kg
	Benzo[g,h,i]perylene	0.0806J	mg/kg
	Benzo[k]fluoranthene	0.117J	mg/kg
	Chrysene	0.421	mg/kg
	Fluoranthene	0.797	mg/kg
	Fluorene	0.0398J	mg/kg
	Indeno[1,2,3-c,d] pyrene	0.0743J	mg/kg
	Phenanthrene	0.426	mg/kg
	Pyrene	0.650	mg/kg
Semivolatile Organic Fuels	Diesel Range Organics	61.8	mg/kg
	Residual Range Organics	966	mg/kg
Volatile Fuels	Gasoline Range Organics	2.08J	mg/kg

Client Sample ID: **SS-13**
Lab Sample ID: 1206052012

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	51.8	mg/kg
	Residual Range Organics	423	mg/kg
Volatile Fuels	Gasoline Range Organics	1.43J	mg/kg

Client Sample ID: **SS-14**
Lab Sample ID: 1206052013

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	56.1	mg/kg
	Residual Range Organics	580	mg/kg
Volatile Fuels	Gasoline Range Organics	1.66J	mg/kg

Client Sample ID: **SS-15**
Lab Sample ID: 1206052014

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	29.5	mg/kg
	Residual Range Organics	95.6J	mg/kg
Volatile Fuels	Gasoline Range Organics	1.82J	mg/kg

Client Sample ID: **SS-16**
Lab Sample ID: 1206052015

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	61.6	mg/kg
	Residual Range Organics	779	mg/kg
Volatile Fuels	Gasoline Range Organics	2.05J	mg/kg

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Detectable Results Summary

Client Sample ID: **SS-17**
Lab Sample ID: 1206052016

Semivolatile Organic Fuels

Parameter	Result	Units
Diesel Range Organics	31.4	mg/kg
Residual Range Organics	103J	mg/kg

Volatile Fuels

Parameter	Result	Units
Gasoline Range Organics	1.56J	mg/kg

Client Sample ID: **TB2/PW7-30-5**
Lab Sample ID: 1206052017

Volatile Fuels

Parameter	Result	Units
Gasoline Range Organics	1.03J	mg/kg

Client Sample ID: **TB1/PW7-30-8**
Lab Sample ID: 1206052018

Volatile Fuels

Parameter	Result	Units
Gasoline Range Organics	0.933J	mg/kg

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Results of **ARFF-SB1-03**

Client Sample ID: **ARFF-SB1-03**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052001
Lab Project ID: 1206052

Collection Date: 10/24/20 04:00
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):91.0
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	14.8	J	21.8	6.75	mg/kg	1		11/12/20 04:30
Surrogates								
5a Androstane (surr)	102		50-150		%	1		11/12/20 04:30

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/12/20 04:30
Container ID: 1206052001-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.299 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	54.5	U	109	46.8	mg/kg	1		11/12/20 04:30
Surrogates								
n-Triacontane-d62 (surr)	100		50-150		%	1		11/12/20 04:30

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/12/20 04:30
Container ID: 1206052001-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.299 g
Prep Extract Vol: 5 mL

Print Date: 12/01/2020 1:19:42PM

J flagging is activated

Results of **ARFF-SB1-03**

Client Sample ID: **ARFF-SB1-03**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052001
Lab Project ID: 1206052

Collection Date: 10/24/20 04:00
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):91.0
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.33	J	3.54	1.06	mg/kg	1		11/06/20 20:16
Surrogates								
4-Bromofluorobenzene (surr)	86.6		50-150		%	1		11/06/20 20:16

Batch Information

Analytical Batch: VFC15441
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/06/20 20:16
Container ID: 1206052001-B

Prep Batch: VXX36661
Prep Method: SW5035A
Prep Date/Time: 10/24/20 04:00
Prep Initial Wt./Vol.: 45.055 g
Prep Extract Vol: 29.0614 mL

Print Date: 12/01/2020 1:19:42PM

J flagging is activated

Results of **ARFF-SB1-03**

Client Sample ID: **ARFF-SB1-03**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052001
Lab Project ID: 1206052

Collection Date: 10/24/20 04:00
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):91.0
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.00885	U	0.0177	0.00553	mg/kg	1		11/03/20 11:46
Ethylbenzene	0.0177	U	0.0354	0.0111	mg/kg	1		11/03/20 11:46
o-Xylene	0.0177	U	0.0354	0.0111	mg/kg	1		11/03/20 11:46
P & M -Xylene	0.0355	U	0.0709	0.0213	mg/kg	1		11/03/20 11:46
Toluene	0.0177	U	0.0354	0.0111	mg/kg	1		11/03/20 11:46
Xylenes (total)	0.0530	U	0.106	0.0323	mg/kg	1		11/03/20 11:46
Surrogates								
1,2-Dichloroethane-D4 (surr)	92.4		71-136		%	1		11/03/20 11:46
4-Bromofluorobenzene (surr)	89.6		55-151		%	1		11/03/20 11:46
Toluene-d8 (surr)	102		85-116		%	1		11/03/20 11:46

Batch Information

Analytical Batch: VMS20478
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 11/03/20 11:46
Container ID: 1206052001-B

Prep Batch: VXX36647
Prep Method: SW5035A
Prep Date/Time: 10/24/20 04:00
Prep Initial Wt./Vol.: 45.055 g
Prep Extract Vol: 29.0614 mL

Print Date: 12/01/2020 1:19:42PM

J flagging is activated

Results of **ARFF-SB2-03**

Client Sample ID: **ARFF-SB2-03**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052002
Lab Project ID: 1206052

Collection Date: 10/24/20 04:55
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):84.0
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	19.7	J	23.7	7.35	mg/kg	1		11/12/20 04:40
Surrogates								
5a Androstane (surr)	103		50-150		%	1		11/12/20 04:40

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/12/20 04:40
Container ID: 1206052002-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.13 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	112	J	119	51.0	mg/kg	1		11/12/20 04:40
Surrogates								
n-Triacontane-d62 (surr)	100		50-150		%	1		11/12/20 04:40

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/12/20 04:40
Container ID: 1206052002-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.13 g
Prep Extract Vol: 5 mL

Results of **ARFF-SB2-03**

Client Sample ID: **ARFF-SB2-03**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052002
Lab Project ID: 1206052

Collection Date: 10/24/20 04:55
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):84.0
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.54	J	5.00	1.50	mg/kg	1		11/06/20 20:33
Surrogates								
4-Bromofluorobenzene (surr)	89.6		50-150		%	1		11/06/20 20:33

Batch Information

Analytical Batch: VFC15441
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/06/20 20:33
Container ID: 1206052002-B

Prep Batch: VXX36661
Prep Method: SW5035A
Prep Date/Time: 10/24/20 04:55
Prep Initial Wt./Vol.: 36.776 g
Prep Extract Vol: 30.8886 mL

Results of **ARFF-SB2-03**

Client Sample ID: **ARFF-SB2-03**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052002
Lab Project ID: 1206052

Collection Date: 10/24/20 04:55
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):84.0
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0125	U	0.0250	0.00780	mg/kg	1		11/03/20 12:02
Ethylbenzene	0.0250	U	0.0500	0.0156	mg/kg	1		11/03/20 12:02
o-Xylene	0.0250	U	0.0500	0.0156	mg/kg	1		11/03/20 12:02
P & M -Xylene	0.0500	U	0.100	0.0300	mg/kg	1		11/03/20 12:02
Toluene	0.0250	U	0.0500	0.0156	mg/kg	1		11/03/20 12:02
Xylenes (total)	0.0750	U	0.150	0.0456	mg/kg	1		11/03/20 12:02
Surrogates								
1,2-Dichloroethane-D4 (surr)	91.8		71-136		%	1		11/03/20 12:02
4-Bromofluorobenzene (surr)	95.8		55-151		%	1		11/03/20 12:02
Toluene-d8 (surr)	101		85-116		%	1		11/03/20 12:02

Batch Information

Analytical Batch: VMS20478
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 11/03/20 12:02
Container ID: 1206052002-B

Prep Batch: VXX36647
Prep Method: SW5035A
Prep Date/Time: 10/24/20 04:55
Prep Initial Wt./Vol.: 36.776 g
Prep Extract Vol: 30.8886 mL

Print Date: 12/01/2020 1:19:42PM

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Results of **10-28-SB4-03**

Client Sample ID: **10-28-SB4-03**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052003
Lab Project ID: 1206052

Collection Date: 10/25/20 03:30
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):82.2
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	23.1	J	24.1	7.48	mg/kg	1		11/12/20 04:51
Surrogates								
5a Androstane (surr)	98.5		50-150		%	1		11/12/20 04:51

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/12/20 04:51
Container ID: 1206052003-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.248 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	250		121	51.9	mg/kg	1		11/12/20 04:51
Surrogates								
n-Triacontane-d62 (surr)	98.6		50-150		%	1		11/12/20 04:51

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/12/20 04:51
Container ID: 1206052003-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.248 g
Prep Extract Vol: 5 mL

Results of **10-28-SB4-03**

Client Sample ID: **10-28-SB4-03**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052003
Lab Project ID: 1206052

Collection Date: 10/25/20 03:30
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):82.2
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.51	J	6.34	1.90	mg/kg	1		11/06/20 20:51
Surrogates								
4-Bromofluorobenzene (surr)	84.1		50-150		%	1		11/06/20 20:51

Batch Information

Analytical Batch: VFC15441
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/06/20 20:51
Container ID: 1206052003-B

Prep Batch: VXX36661
Prep Method: SW5035A
Prep Date/Time: 10/25/20 03:30
Prep Initial Wt./Vol.: 28.909 g
Prep Extract Vol: 30.136 mL

Results of **10-28-SB4-03**

Client Sample ID: **10-28-SB4-03**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052003
Lab Project ID: 1206052

Collection Date: 10/25/20 03:30
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):82.2
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0159	U	0.0317	0.00989	mg/kg	1		11/03/20 12:17
Ethylbenzene	0.0317	U	0.0634	0.0198	mg/kg	1		11/03/20 12:17
o-Xylene	0.0317	U	0.0634	0.0198	mg/kg	1		11/03/20 12:17
P & M -Xylene	0.0635	U	0.127	0.0380	mg/kg	1		11/03/20 12:17
Toluene	0.0317	U	0.0634	0.0198	mg/kg	1		11/03/20 12:17
Xylenes (total)	0.0950	U	0.190	0.0578	mg/kg	1		11/03/20 12:17
Surrogates								
1,2-Dichloroethane-D4 (surr)	96		71-136		%	1		11/03/20 12:17
4-Bromofluorobenzene (surr)	86.5		55-151		%	1		11/03/20 12:17
Toluene-d8 (surr)	103		85-116		%	1		11/03/20 12:17

Batch Information

Analytical Batch: VMS20478
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 11/03/20 12:17
Container ID: 1206052003-B

Prep Batch: VXX36647
Prep Method: SW5035A
Prep Date/Time: 10/25/20 03:30
Prep Initial Wt./Vol.: 28.909 g
Prep Extract Vol: 30.136 mL

Results of **ARFF-SB3-03**

Client Sample ID: **ARFF-SB3-03**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052004
Lab Project ID: 1206052

Collection Date: 10/26/20 16:50
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):82.1
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0150	U	0.0301	0.00752	mg/kg	1		11/25/20 20:23
2-Methylnaphthalene	0.0150	U	0.0301	0.00752	mg/kg	1		11/25/20 20:23
Acenaphthene	0.0150	U	0.0301	0.00752	mg/kg	1		11/25/20 20:23
Acenaphthylene	0.0150	U	0.0301	0.00752	mg/kg	1		11/25/20 20:23
Anthracene	0.0150	U	0.0301	0.00752	mg/kg	1		11/25/20 20:23
Benzo(a)Anthracene	0.0150	U	0.0301	0.00752	mg/kg	1		11/25/20 20:23
Benzo[a]pyrene	0.0150	U	0.0301	0.00752	mg/kg	1		11/25/20 20:23
Benzo[b]Fluoranthene	0.0150	U	0.0301	0.00752	mg/kg	1		11/25/20 20:23
Benzo[g,h,i]perylene	0.0150	U	0.0301	0.00752	mg/kg	1		11/25/20 20:23
Benzo[k]fluoranthene	0.0150	U	0.0301	0.00752	mg/kg	1		11/25/20 20:23
Chrysene	0.0150	U	0.0301	0.00752	mg/kg	1		11/25/20 20:23
Dibenzo[a,h]anthracene	0.0150	U	0.0301	0.00752	mg/kg	1		11/25/20 20:23
Fluoranthene	0.0150	U	0.0301	0.00752	mg/kg	1		11/25/20 20:23
Fluorene	0.0150	U	0.0301	0.00752	mg/kg	1		11/25/20 20:23
Indeno[1,2,3-c,d] pyrene	0.0150	U	0.0301	0.00752	mg/kg	1		11/25/20 20:23
Naphthalene	0.0121	U	0.0241	0.00601	mg/kg	1		11/25/20 20:23
Phenanthrene	0.0150	U	0.0301	0.00752	mg/kg	1		11/25/20 20:23
Pyrene	0.0150	U	0.0301	0.00752	mg/kg	1		11/25/20 20:23
Surrogates								
2-Methylnaphthalene-d10 (surr)	84.9		58-103		%	1		11/25/20 20:23
Fluoranthene-d10 (surr)	86.4		54-113		%	1		11/25/20 20:23

Batch Information

Analytical Batch: XMS12422
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 11/25/20 20:23
Container ID: 1206052004-A

Prep Batch: XXX44200
Prep Method: SW3550C
Prep Date/Time: 11/06/20 11:59
Prep Initial Wt./Vol.: 22.778 g
Prep Extract Vol: 5 mL

Print Date: 12/01/2020 1:19:42PM

J flagging is activated

Results of **ARFF-SB3-03**

Client Sample ID: **ARFF-SB3-03**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052004
Lab Project ID: 1206052

Collection Date: 10/26/20 16:50
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):82.1
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	14.1	J	24.1	7.46	mg/kg	1		11/12/20 05:01
Surrogates								
5a Androstane (surr)	102		50-150		%	1		11/12/20 05:01

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/12/20 05:01
Container ID: 1206052004-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.35 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	60.0	U	120	51.7	mg/kg	1		11/12/20 05:01
Surrogates								
n-Triacontane-d62 (surr)	98.4		50-150		%	1		11/12/20 05:01

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/12/20 05:01
Container ID: 1206052004-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.35 g
Prep Extract Vol: 5 mL

Print Date: 12/01/2020 1:19:42PM

J flagging is activated

Results of **ARFF-SB3-03**

Client Sample ID: **ARFF-SB3-03**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052004
Lab Project ID: 1206052

Collection Date: 10/26/20 16:50
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):82.1
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.72	J	5.16	1.55	mg/kg	1		11/06/20 21:09
Surrogates								
4-Bromofluorobenzene (surr)	88.5		50-150		%	1		11/06/20 21:09

Batch Information

Analytical Batch: VFC15441
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/06/20 21:09
Container ID: 1206052004-B

Prep Batch: VXX36661
Prep Method: SW5035A
Prep Date/Time: 10/26/20 16:50
Prep Initial Wt./Vol.: 37.397 g
Prep Extract Vol: 31.6799 mL

Results of **ARFF-SB3-03**

Client Sample ID: **ARFF-SB3-03**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052004
Lab Project ID: 1206052

Collection Date: 10/26/20 16:50
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):82.1
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0129	U	0.0258	0.00804	mg/kg	1		11/03/20 12:33
Ethylbenzene	0.0258	U	0.0516	0.0161	mg/kg	1		11/03/20 12:33
o-Xylene	0.0258	U	0.0516	0.0161	mg/kg	1		11/03/20 12:33
P & M -Xylene	0.0515	U	0.103	0.0309	mg/kg	1		11/03/20 12:33
Toluene	0.0258	U	0.0516	0.0161	mg/kg	1		11/03/20 12:33
Xylenes (total)	0.0775	U	0.155	0.0470	mg/kg	1		11/03/20 12:33
Surrogates								
1,2-Dichloroethane-D4 (surr)	96.5		71-136		%	1		11/03/20 12:33
4-Bromofluorobenzene (surr)	89.9		55-151		%	1		11/03/20 12:33
Toluene-d8 (surr)	100		85-116		%	1		11/03/20 12:33

Batch Information

Analytical Batch: VMS20478
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 11/03/20 12:33
Container ID: 1206052004-B

Prep Batch: VXX36647
Prep Method: SW5035A
Prep Date/Time: 10/26/20 16:50
Prep Initial Wt./Vol.: 37.397 g
Prep Extract Vol: 31.6799 mL

Results of **ARFF-SB3-13**

Client Sample ID: **ARFF-SB3-13**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052005
Lab Project ID: 1206052

Collection Date: 10/26/20 16:40
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):82.3
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0150	U	0.0301	0.00753	mg/kg	1		11/25/20 20:43
2-Methylnaphthalene	0.0150	U	0.0301	0.00753	mg/kg	1		11/25/20 20:43
Acenaphthene	0.0150	U	0.0301	0.00753	mg/kg	1		11/25/20 20:43
Acenaphthylene	0.0150	U	0.0301	0.00753	mg/kg	1		11/25/20 20:43
Anthracene	0.0150	U	0.0301	0.00753	mg/kg	1		11/25/20 20:43
Benzo(a)Anthracene	0.0150	U	0.0301	0.00753	mg/kg	1		11/25/20 20:43
Benzo[a]pyrene	0.0150	U	0.0301	0.00753	mg/kg	1		11/25/20 20:43
Benzo[b]Fluoranthene	0.0150	U	0.0301	0.00753	mg/kg	1		11/25/20 20:43
Benzo[g,h,i]perylene	0.0150	U	0.0301	0.00753	mg/kg	1		11/25/20 20:43
Benzo[k]fluoranthene	0.0150	U	0.0301	0.00753	mg/kg	1		11/25/20 20:43
Chrysene	0.0150	U	0.0301	0.00753	mg/kg	1		11/25/20 20:43
Dibenzo[a,h]anthracene	0.0150	U	0.0301	0.00753	mg/kg	1		11/25/20 20:43
Fluoranthene	0.0150	U	0.0301	0.00753	mg/kg	1		11/25/20 20:43
Fluorene	0.0150	U	0.0301	0.00753	mg/kg	1		11/25/20 20:43
Indeno[1,2,3-c,d] pyrene	0.0150	U	0.0301	0.00753	mg/kg	1		11/25/20 20:43
Naphthalene	0.0121	U	0.0241	0.00603	mg/kg	1		11/25/20 20:43
Phenanthrene	0.0150	U	0.0301	0.00753	mg/kg	1		11/25/20 20:43
Pyrene	0.0150	U	0.0301	0.00753	mg/kg	1		11/25/20 20:43
Surrogates								
2-Methylnaphthalene-d10 (surr)	83.4		58-103		%	1		11/25/20 20:43
Fluoranthene-d10 (surr)	84.9		54-113		%	1		11/25/20 20:43

Batch Information

Analytical Batch: XMS12422
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 11/25/20 20:43
Container ID: 1206052005-A

Prep Batch: XXX44200
Prep Method: SW3550C
Prep Date/Time: 11/06/20 11:59
Prep Initial Wt./Vol.: 22.671 g
Prep Extract Vol: 5 mL

Print Date: 12/01/2020 1:19:42PM

J flagging is activated

Results of **ARFF-SB3-13**

Client Sample ID: **ARFF-SB3-13**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052005
Lab Project ID: 1206052

Collection Date: 10/26/20 16:40
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):82.3
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	14.1	J	24.0	7.45	mg/kg	1		11/12/20 05:11
Surrogates								
5a Androstane (surr)	102		50-150		%	1		11/12/20 05:11

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/12/20 05:11
Container ID: 1206052005-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.319 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	60.0	U	120	51.7	mg/kg	1		11/12/20 05:11
Surrogates								
n-Triacontane-d62 (surr)	99.6		50-150		%	1		11/12/20 05:11

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/12/20 05:11
Container ID: 1206052005-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.319 g
Prep Extract Vol: 5 mL

Results of **ARFF-SB3-13**

Client Sample ID: **ARFF-SB3-13**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052005
Lab Project ID: 1206052

Collection Date: 10/26/20 16:40
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):82.3
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.62	J	4.87	1.46	mg/kg	1		11/06/20 21:26
Surrogates								
4-Bromofluorobenzene (surr)	87.9		50-150		%	1		11/06/20 21:26

Batch Information

Analytical Batch: VFC15441
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/06/20 21:26
Container ID: 1206052005-B

Prep Batch: VXX36661
Prep Method: SW5035A
Prep Date/Time: 10/26/20 16:40
Prep Initial Wt./Vol.: 39.97 g
Prep Extract Vol: 32.0577 mL

Results of **ARFF-SB3-13**

Client Sample ID: **ARFF-SB3-13**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052005
Lab Project ID: 1206052

Collection Date: 10/26/20 16:40
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):82.3
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0122	U	0.0244	0.00760	mg/kg	1		11/03/20 12:48
Ethylbenzene	0.0244	U	0.0487	0.0152	mg/kg	1		11/03/20 12:48
o-Xylene	0.0244	U	0.0487	0.0152	mg/kg	1		11/03/20 12:48
P & M -Xylene	0.0487	U	0.0974	0.0292	mg/kg	1		11/03/20 12:48
Toluene	0.0244	U	0.0487	0.0152	mg/kg	1		11/03/20 12:48
Xylenes (total)	0.0730	U	0.146	0.0444	mg/kg	1		11/03/20 12:48
Surrogates								
1,2-Dichloroethane-D4 (surr)	97.2		71-136		%	1		11/03/20 12:48
4-Bromofluorobenzene (surr)	90.3		55-151		%	1		11/03/20 12:48
Toluene-d8 (surr)	101		85-116		%	1		11/03/20 12:48

Batch Information

Analytical Batch: VMS20478
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 11/03/20 12:48
Container ID: 1206052005-B

Prep Batch: VXX36647
Prep Method: SW5035A
Prep Date/Time: 10/26/20 16:40
Prep Initial Wt./Vol.: 39.97 g
Prep Extract Vol: 32.0577 mL

Results of **ARFF-SB4-03**

Client Sample ID: **ARFF-SB4-03**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052006
Lab Project ID: 1206052

Collection Date: 10/26/20 19:45
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):89.3
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	11.9	J	22.1	6.85	mg/kg	1		11/12/20 05:21
Surrogates								
5a Androstane (surr)	103		50-150		%	1		11/12/20 05:21

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/12/20 05:21
Container ID: 1206052006-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.409 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	55.0	U	110	47.5	mg/kg	1		11/12/20 05:21
Surrogates								
n-Triacontane-d62 (surr)	100		50-150		%	1		11/12/20 05:21

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/12/20 05:21
Container ID: 1206052006-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.409 g
Prep Extract Vol: 5 mL

Print Date: 12/01/2020 1:19:42PM

J flagging is activated

Results of **ARFF-SB4-03**

Client Sample ID: **ARFF-SB4-03**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052006
Lab Project ID: 1206052

Collection Date: 10/26/20 19:45
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):89.3
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.55	J	3.75	1.13	mg/kg	1		11/06/20 21:44
Surrogates								
4-Bromofluorobenzene (surr)	86.5		50-150		%	1		11/06/20 21:44

Batch Information

Analytical Batch: VFC15441
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/06/20 21:44
Container ID: 1206052006-B

Prep Batch: VXX36661
Prep Method: SW5035A
Prep Date/Time: 10/26/20 19:45
Prep Initial Wt./Vol.: 44.396 g
Prep Extract Vol: 29.7537 mL

Results of **ARFF-SB4-03**

Client Sample ID: **ARFF-SB4-03**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052006
Lab Project ID: 1206052

Collection Date: 10/26/20 19:45
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):89.3
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.00940	U	0.0188	0.00585	mg/kg	1		11/03/20 13:04
Ethylbenzene	0.0187	U	0.0375	0.0117	mg/kg	1		11/03/20 13:04
o-Xylene	0.0187	U	0.0375	0.0117	mg/kg	1		11/03/20 13:04
P & M -Xylene	0.0376	U	0.0751	0.0225	mg/kg	1		11/03/20 13:04
Toluene	0.0187	U	0.0375	0.0117	mg/kg	1		11/03/20 13:04
Xylenes (total)	0.0565	U	0.113	0.0342	mg/kg	1		11/03/20 13:04
Surrogates								
1,2-Dichloroethane-D4 (surr)	92.3		71-136		%	1		11/03/20 13:04
4-Bromofluorobenzene (surr)	93.7		55-151		%	1		11/03/20 13:04
Toluene-d8 (surr)	101		85-116		%	1		11/03/20 13:04

Batch Information

Analytical Batch: VMS20478
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 11/03/20 13:04
Container ID: 1206052006-B

Prep Batch: VXX36647
Prep Method: SW5035A
Prep Date/Time: 10/26/20 19:45
Prep Initial Wt./Vol.: 44.396 g
Prep Extract Vol: 29.7537 mL

Results of **SS-08**

Client Sample ID: **SS-08**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052007
Lab Project ID: 1206052

Collection Date: 10/29/20 12:30
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):83.5
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	23.7	J	23.8	7.37	mg/kg	1		11/12/20 05:31
Surrogates								
5a Androstane (surr)	95.4		50-150		%	1		11/12/20 05:31

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/12/20 05:31
Container ID: 1206052007-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.22 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	304		119	51.1	mg/kg	1		11/12/20 05:31
Surrogates								
n-Triacontane-d62 (surr)	91.1		50-150		%	1		11/12/20 05:31

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/12/20 05:31
Container ID: 1206052007-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.22 g
Prep Extract Vol: 5 mL

Results of **SS-08**

Client Sample ID: **SS-08**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052007
Lab Project ID: 1206052

Collection Date: 10/29/20 12:30
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):83.5
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.65	J	5.21	1.56	mg/kg	1		11/06/20 22:01
Surrogates								
4-Bromofluorobenzene (surr)	88.3		50-150		%	1		11/06/20 22:01

Batch Information

Analytical Batch: VFC15441
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/06/20 22:01
Container ID: 1206052007-B

Prep Batch: VXX36661
Prep Method: SW5035A
Prep Date/Time: 10/29/20 12:30
Prep Initial Wt./Vol.: 35.41 g
Prep Extract Vol: 30.8404 mL

Results of **SS-08**

Client Sample ID: **SS-08**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052007
Lab Project ID: 1206052

Collection Date: 10/29/20 12:30
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):83.5
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0131	U	0.0261	0.00814	mg/kg	1		11/03/20 13:19
Ethylbenzene	0.0261	U	0.0521	0.0163	mg/kg	1		11/03/20 13:19
o-Xylene	0.0261	U	0.0521	0.0163	mg/kg	1		11/03/20 13:19
P & M -Xylene	0.0520	U	0.104	0.0313	mg/kg	1		11/03/20 13:19
Toluene	0.0261	U	0.0521	0.0163	mg/kg	1		11/03/20 13:19
Xylenes (total)	0.0780	U	0.156	0.0476	mg/kg	1		11/03/20 13:19
Surrogates								
1,2-Dichloroethane-D4 (surr)	92.4		71-136		%	1		11/03/20 13:19
4-Bromofluorobenzene (surr)	94		55-151		%	1		11/03/20 13:19
Toluene-d8 (surr)	99.8		85-116		%	1		11/03/20 13:19

Batch Information

Analytical Batch: VMS20478
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 11/03/20 13:19
Container ID: 1206052007-B

Prep Batch: VXX36647
Prep Method: SW5035A
Prep Date/Time: 10/29/20 12:30
Prep Initial Wt./Vol.: 35.41 g
Prep Extract Vol: 30.8404 mL

Results of **SS-09**

Client Sample ID: **SS-09**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052008
Lab Project ID: 1206052

Collection Date: 10/29/20 13:00
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):89.2
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	23.3		22.3	6.90	mg/kg	1		11/12/20 05:41
Surrogates								
5a Androstane (surr)	98.4		50-150		%	1		11/12/20 05:41

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/12/20 05:41
Container ID: 1206052008-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.212 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	200		111	47.9	mg/kg	1		11/12/20 05:41
Surrogates								
n-Triacontane-d62 (surr)	98.3		50-150		%	1		11/12/20 05:41

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/12/20 05:41
Container ID: 1206052008-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.212 g
Prep Extract Vol: 5 mL

Results of **SS-09**

Client Sample ID: **SS-09**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052008
Lab Project ID: 1206052

Collection Date: 10/29/20 13:00
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):89.2
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.11	J	3.28	0.984	mg/kg	1		11/06/20 22:19
Surrogates								
4-Bromofluorobenzene (surr)	88.1		50-150		%	1		11/06/20 22:19

Batch Information

Analytical Batch: VFC15441
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/06/20 22:19
Container ID: 1206052008-B

Prep Batch: VXX36661
Prep Method: SW5035A
Prep Date/Time: 10/29/20 13:00
Prep Initial Wt./Vol.: 52.442 g
Prep Extract Vol: 30.6817 mL

Results of **SS-09**

Client Sample ID: **SS-09**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052008
Lab Project ID: 1206052

Collection Date: 10/29/20 13:00
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):89.2
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.00820	U	0.0164	0.00512	mg/kg	1		11/03/20 13:34
Ethylbenzene	0.0164	U	0.0328	0.0102	mg/kg	1		11/03/20 13:34
o-Xylene	0.0164	U	0.0328	0.0102	mg/kg	1		11/03/20 13:34
P & M -Xylene	0.0328	U	0.0656	0.0197	mg/kg	1		11/03/20 13:34
Toluene	0.0164	U	0.0328	0.0102	mg/kg	1		11/03/20 13:34
Xylenes (total)	0.0492	U	0.0984	0.0299	mg/kg	1		11/03/20 13:34
Surrogates								
1,2-Dichloroethane-D4 (surr)	97.2		71-136		%	1		11/03/20 13:34
4-Bromofluorobenzene (surr)	92.3		55-151		%	1		11/03/20 13:34
Toluene-d8 (surr)	101		85-116		%	1		11/03/20 13:34

Batch Information

Analytical Batch: VMS20478
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 11/03/20 13:34
Container ID: 1206052008-B

Prep Batch: VXX36647
Prep Method: SW5035A
Prep Date/Time: 10/29/20 13:00
Prep Initial Wt./Vol.: 52.442 g
Prep Extract Vol: 30.6817 mL

Results of **SS-10**

Client Sample ID: **SS-10**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052009
Lab Project ID: 1206052

Collection Date: 10/29/20 20:30
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):89.6
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	303		88.7	27.5	mg/kg	4		11/13/20 13:20
Surrogates								
5a Androstane (surr)	107		50-150		%	4		11/13/20 13:20

Batch Information

Analytical Batch: XFC15810
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/13/20 13:20
Container ID: 1206052009-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.17 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	4350		444	191	mg/kg	4		11/13/20 13:20
Surrogates								
n-Triacontane-d62 (surr)	130		50-150		%	4		11/13/20 13:20

Batch Information

Analytical Batch: XFC15810
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/13/20 13:20
Container ID: 1206052009-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.17 g
Prep Extract Vol: 5 mL

Results of **SS-10**

Client Sample ID: **SS-10**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052009
Lab Project ID: 1206052

Collection Date: 10/29/20 20:30
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):89.6
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.08	J	4.90	1.47	mg/kg	1		11/06/20 22:37
Surrogates								
4-Bromofluorobenzene (surr)	84.5		50-150		%	1		11/06/20 22:37

Batch Information

Analytical Batch: VFC15441
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/06/20 22:37
Container ID: 1206052009-B

Prep Batch: VXX36661
Prep Method: SW5035A
Prep Date/Time: 10/29/20 20:30
Prep Initial Wt./Vol.: 32.231 g
Prep Extract Vol: 28.3387 mL

Results of **SS-10**

Client Sample ID: **SS-10**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052009
Lab Project ID: 1206052

Collection Date: 10/29/20 20:30
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):89.6
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0123	U	0.0245	0.00765	mg/kg	1		11/03/20 13:50
Ethylbenzene	0.0245	U	0.0490	0.0153	mg/kg	1		11/03/20 13:50
o-Xylene	0.0245	U	0.0490	0.0153	mg/kg	1		11/03/20 13:50
P & M -Xylene	0.0491	U	0.0981	0.0294	mg/kg	1		11/03/20 13:50
Toluene	0.0245	U	0.0490	0.0153	mg/kg	1		11/03/20 13:50
Xylenes (total)	0.0735	U	0.147	0.0447	mg/kg	1		11/03/20 13:50
Surrogates								
1,2-Dichloroethane-D4 (surr)	96.5		71-136		%	1		11/03/20 13:50
4-Bromofluorobenzene (surr)	87.7		55-151		%	1		11/03/20 13:50
Toluene-d8 (surr)	101		85-116		%	1		11/03/20 13:50

Batch Information

Analytical Batch: VMS20478
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 11/03/20 13:50
Container ID: 1206052009-B

Prep Batch: VXX36647
Prep Method: SW5035A
Prep Date/Time: 10/29/20 20:30
Prep Initial Wt./Vol.: 32.231 g
Prep Extract Vol: 28.3387 mL

Results of **SS-11**

Client Sample ID: **SS-11**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052010
Lab Project ID: 1206052

Collection Date: 10/29/20 20:35
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):89.6
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	360		88.5	27.4	mg/kg	4		11/13/20 13:30
Surrogates								
5a Androstane (surr)	117		50-150		%	4		11/13/20 13:30

Batch Information

Analytical Batch: XFC15810
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/13/20 13:30
Container ID: 1206052010-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.283 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	4350		442	190	mg/kg	4		11/13/20 13:30
Surrogates								
n-Triacontane-d62 (surr)	144		50-150		%	4		11/13/20 13:30

Batch Information

Analytical Batch: XFC15810
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/13/20 13:30
Container ID: 1206052010-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.283 g
Prep Extract Vol: 5 mL

Results of **SS-11**

Client Sample ID: **SS-11**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052010
Lab Project ID: 1206052

Collection Date: 10/29/20 20:35
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):89.6
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.24	J	6.24	1.87	mg/kg	1		11/06/20 22:54
Surrogates								
4-Bromofluorobenzene (surr)	80.3		50-150		%	1		11/06/20 22:54

Batch Information

Analytical Batch: VFC15441
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/06/20 22:54
Container ID: 1206052010-B

Prep Batch: VXX36661
Prep Method: SW5035A
Prep Date/Time: 10/29/20 20:35
Prep Initial Wt./Vol.: 24.658 g
Prep Extract Vol: 27.5759 mL

Results of **SS-11**

Client Sample ID: **SS-11**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052010
Lab Project ID: 1206052

Collection Date: 10/29/20 20:35
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):89.6
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0156	U	0.0312	0.00974	mg/kg	1		11/03/20 14:05
Ethylbenzene	0.0312	U	0.0624	0.0195	mg/kg	1		11/03/20 14:05
o-Xylene	0.0312	U	0.0624	0.0195	mg/kg	1		11/03/20 14:05
P & M -Xylene	0.0625	U	0.125	0.0375	mg/kg	1		11/03/20 14:05
Toluene	0.0312	U	0.0624	0.0195	mg/kg	1		11/03/20 14:05
Xylenes (total)	0.0935	U	0.187	0.0569	mg/kg	1		11/03/20 14:05
Surrogates								
1,2-Dichloroethane-D4 (surr)	95.6		71-136		%	1		11/03/20 14:05
4-Bromofluorobenzene (surr)	85.1		55-151		%	1		11/03/20 14:05
Toluene-d8 (surr)	101		85-116		%	1		11/03/20 14:05

Batch Information

Analytical Batch: VMS20478
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 11/03/20 14:05
Container ID: 1206052010-B

Prep Batch: VXX36647
Prep Method: SW5035A
Prep Date/Time: 10/29/20 20:35
Prep Initial Wt./Vol.: 24.658 g
Prep Extract Vol: 27.5759 mL

Results of **SS-12**

Client Sample ID: **SS-12**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052011
Lab Project ID: 1206052

Collection Date: 10/29/20 21:00
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):93.5
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0665	U	0.133	0.0332	mg/kg	5		11/25/20 21:24
2-Methylnaphthalene	0.0665	U	0.133	0.0332	mg/kg	5		11/25/20 21:24
Acenaphthene	0.0392	J	0.133	0.0332	mg/kg	5		11/25/20 21:24
Acenaphthylene	0.0665	U	0.133	0.0332	mg/kg	5		11/25/20 21:24
Anthracene	0.0781	J	0.133	0.0332	mg/kg	5		11/25/20 21:24
Benzo(a)Anthracene	0.392		0.133	0.0332	mg/kg	5		11/25/20 21:24
Benzo[a]pyrene	0.217		0.133	0.0332	mg/kg	5		11/25/20 21:24
Benzo[b]Fluoranthene	0.365		0.133	0.0332	mg/kg	5		11/25/20 21:24
Benzo[g,h,i]perylene	0.0806	J	0.133	0.0332	mg/kg	5		11/25/20 21:24
Benzo[k]fluoranthene	0.117	J	0.133	0.0332	mg/kg	5		11/25/20 21:24
Chrysene	0.421		0.133	0.0332	mg/kg	5		11/25/20 21:24
Dibenzo[a,h]anthracene	0.0665	U	0.133	0.0332	mg/kg	5		11/25/20 21:24
Fluoranthene	0.797		0.133	0.0332	mg/kg	5		11/25/20 21:24
Fluorene	0.0398	J	0.133	0.0332	mg/kg	5		11/25/20 21:24
Indeno[1,2,3-c,d] pyrene	0.0743	J	0.133	0.0332	mg/kg	5		11/25/20 21:24
Naphthalene	0.0530	U	0.106	0.0266	mg/kg	5		11/25/20 21:24
Phenanthrene	0.426		0.133	0.0332	mg/kg	5		11/25/20 21:24
Pyrene	0.650		0.133	0.0332	mg/kg	5		11/25/20 21:24
Surrogates								
2-Methylnaphthalene-d10 (surr)	82.7		58-103		%	5		11/25/20 21:24
Fluoranthene-d10 (surr)	85.8		54-113		%	5		11/25/20 21:24

Batch Information

Analytical Batch: XMS12422
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 11/25/20 21:24
Container ID: 1206052011-A

Prep Batch: XXX44200
Prep Method: SW3550C
Prep Date/Time: 11/06/20 11:59
Prep Initial Wt./Vol.: 22.629 g
Prep Extract Vol: 5 mL

Print Date: 12/01/2020 1:19:42PM

J flagging is activated

Results of **SS-12**

Client Sample ID: **SS-12**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052011
Lab Project ID: 1206052

Collection Date: 10/29/20 21:00
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):93.5
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	61.8		21.1	6.55	mg/kg	1		11/12/20 05:51
Surrogates								
5a Androstane (surr)	97.7		50-150		%	1		11/12/20 05:51

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/12/20 05:51
Container ID: 1206052011-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.355 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	966		106	45.4	mg/kg	1		11/12/20 05:51
Surrogates								
n-Triacontane-d62 (surr)	111		50-150		%	1		11/12/20 05:51

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/12/20 05:51
Container ID: 1206052011-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.355 g
Prep Extract Vol: 5 mL

Results of **SS-12**

Client Sample ID: **SS-12**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052011
Lab Project ID: 1206052

Collection Date: 10/29/20 21:00
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):93.5
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.08	J	6.59	1.98	mg/kg	1		11/06/20 23:12
Surrogates								
4-Bromofluorobenzene (surr)	84.8		50-150		%	1		11/06/20 23:12

Batch Information

Analytical Batch: VFC15441
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/06/20 23:12
Container ID: 1206052011-B

Prep Batch: VXX36661
Prep Method: SW5035A
Prep Date/Time: 10/29/20 21:00
Prep Initial Wt./Vol.: 21.425 g
Prep Extract Vol: 26.3907 mL

Results of **SS-12**

Client Sample ID: **SS-12**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052011
Lab Project ID: 1206052

Collection Date: 10/29/20 21:00
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):93.5
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0164	U	0.0329	0.0103	mg/kg	1		11/03/20 14:21
Ethylbenzene	0.0330	U	0.0659	0.0205	mg/kg	1		11/03/20 14:21
o-Xylene	0.0330	U	0.0659	0.0205	mg/kg	1		11/03/20 14:21
P & M -Xylene	0.0660	U	0.132	0.0395	mg/kg	1		11/03/20 14:21
Toluene	0.0330	U	0.0659	0.0205	mg/kg	1		11/03/20 14:21
Xylenes (total)	0.0990	U	0.198	0.0601	mg/kg	1		11/03/20 14:21
Surrogates								
1,2-Dichloroethane-D4 (surr)	96		71-136		%	1		11/03/20 14:21
4-Bromofluorobenzene (surr)	88.1		55-151		%	1		11/03/20 14:21
Toluene-d8 (surr)	101		85-116		%	1		11/03/20 14:21

Batch Information

Analytical Batch: VMS20478
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 11/03/20 14:21
Container ID: 1206052011-B

Prep Batch: VXX36647
Prep Method: SW5035A
Prep Date/Time: 10/29/20 21:00
Prep Initial Wt./Vol.: 21.425 g
Prep Extract Vol: 26.3907 mL

Print Date: 12/01/2020 1:19:42PM

J flagging is activated

Results of **SS-13**

Client Sample ID: **SS-13**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052012
Lab Project ID: 1206052

Collection Date: 10/29/20 15:35
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):84.9
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	51.8		22.5	6.98	mg/kg	1		11/12/20 06:01
Surrogates								
5a Androstane (surr)	96.1		50-150		%	1		11/12/20 06:01

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/12/20 06:01
Container ID: 1206052012-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 31.391 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	423		113	48.4	mg/kg	1		11/12/20 06:01
Surrogates								
n-Triacontane-d62 (surr)	110		50-150		%	1		11/12/20 06:01

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/12/20 06:01
Container ID: 1206052012-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 31.391 g
Prep Extract Vol: 5 mL

Results of **SS-13**

Client Sample ID: **SS-13**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052012
Lab Project ID: 1206052

Collection Date: 10/29/20 15:35
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):84.9
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.43	J	3.67	1.10	mg/kg	1		11/06/20 23:30
Surrogates								
4-Bromofluorobenzene (surr)	86.1		50-150		%	1		11/06/20 23:30

Batch Information

Analytical Batch: VFC15441
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/06/20 23:30
Container ID: 1206052012-B

Prep Batch: VXX36661
Prep Method: SW5035A
Prep Date/Time: 10/29/20 15:35
Prep Initial Wt./Vol.: 53.024 g
Prep Extract Vol: 33.0049 mL

Results of **SS-13**

Client Sample ID: **SS-13**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052012
Lab Project ID: 1206052

Collection Date: 10/29/20 15:35
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):84.9
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.00915	U	0.0183	0.00572	mg/kg	1		11/03/20 14:36
Ethylbenzene	0.0184	U	0.0367	0.0114	mg/kg	1		11/03/20 14:36
o-Xylene	0.0184	U	0.0367	0.0114	mg/kg	1		11/03/20 14:36
P & M -Xylene	0.0367	U	0.0733	0.0220	mg/kg	1		11/03/20 14:36
Toluene	0.0184	U	0.0367	0.0114	mg/kg	1		11/03/20 14:36
Xylenes (total)	0.0550	U	0.110	0.0334	mg/kg	1		11/03/20 14:36
Surrogates								
1,2-Dichloroethane-D4 (surr)	93.5		71-136		%	1		11/03/20 14:36
4-Bromofluorobenzene (surr)	92.9		55-151		%	1		11/03/20 14:36
Toluene-d8 (surr)	102		85-116		%	1		11/03/20 14:36

Batch Information

Analytical Batch: VMS20478
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 11/03/20 14:36
Container ID: 1206052012-B

Prep Batch: VXX36647
Prep Method: SW5035A
Prep Date/Time: 10/29/20 15:35
Prep Initial Wt./Vol.: 53.024 g
Prep Extract Vol: 33.0049 mL

Print Date: 12/01/2020 1:19:42PM

J flagging is activated

Results of **SS-14**

Client Sample ID: **SS-14**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052013
Lab Project ID: 1206052

Collection Date: 10/29/20 16:05
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):87.2
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	56.1		22.7	7.03	mg/kg	1		11/12/20 06:11
Surrogates								
5a Androstane (surr)	94.4		50-150		%	1		11/12/20 06:11

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/12/20 06:11
Container ID: 1206052013-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.364 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	580		113	48.7	mg/kg	1		11/12/20 06:11
Surrogates								
n-Triacontane-d62 (surr)	109		50-150		%	1		11/12/20 06:11

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/12/20 06:11
Container ID: 1206052013-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.364 g
Prep Extract Vol: 5 mL

Results of **SS-14**

Client Sample ID: **SS-14**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052013
Lab Project ID: 1206052

Collection Date: 10/29/20 16:05
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):87.2
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.66	J	5.15	1.55	mg/kg	1		11/06/20 23:47
Surrogates								
4-Bromofluorobenzene (surr)	83.2		50-150		%	1		11/06/20 23:47

Batch Information

Analytical Batch: VFC15441
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/06/20 23:47
Container ID: 1206052013-B

Prep Batch: VXX36661
Prep Method: SW5035A
Prep Date/Time: 10/29/20 16:05
Prep Initial Wt./Vol.: 32.469 g
Prep Extract Vol: 29.1652 mL

Results of **SS-14**

Client Sample ID: **SS-14**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052013
Lab Project ID: 1206052

Collection Date: 10/29/20 16:05
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):87.2
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0129	U	0.0258	0.00804	mg/kg	1		11/03/20 14:51
Ethylbenzene	0.0257	U	0.0515	0.0161	mg/kg	1		11/03/20 14:51
o-Xylene	0.0257	U	0.0515	0.0161	mg/kg	1		11/03/20 14:51
P & M -Xylene	0.0515	U	0.103	0.0309	mg/kg	1		11/03/20 14:51
Toluene	0.0257	U	0.0515	0.0161	mg/kg	1		11/03/20 14:51
Xylenes (total)	0.0775	U	0.155	0.0470	mg/kg	1		11/03/20 14:51
Surrogates								
1,2-Dichloroethane-D4 (surr)	96.8		71-136		%	1		11/03/20 14:51
4-Bromofluorobenzene (surr)	86.7		55-151		%	1		11/03/20 14:51
Toluene-d8 (surr)	102		85-116		%	1		11/03/20 14:51

Batch Information

Analytical Batch: VMS20478
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 11/03/20 14:51
Container ID: 1206052013-B

Prep Batch: VXX36647
Prep Method: SW5035A
Prep Date/Time: 10/29/20 16:05
Prep Initial Wt./Vol.: 32.469 g
Prep Extract Vol: 29.1652 mL

SGS North America Inc.
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Results of **SS-15**

Client Sample ID: **SS-15**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052014
Lab Project ID: 1206052

Collection Date: 10/29/20 16:25
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):90.3
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	29.5		21.9	6.80	mg/kg	1		11/12/20 06:21
Surrogates								
5a Androstane (surr)	97		50-150		%	1		11/12/20 06:21

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/12/20 06:21
Container ID: 1206052014-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.289 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	95.6	J	110	47.2	mg/kg	1		11/12/20 06:21
Surrogates								
n-Triacontane-d62 (surr)	108		50-150		%	1		11/12/20 06:21

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/12/20 06:21
Container ID: 1206052014-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.289 g
Prep Extract Vol: 5 mL

Print Date: 12/01/2020 1:19:42PM

J flagging is activated

Results of **SS-15**

Client Sample ID: **SS-15**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052014
Lab Project ID: 1206052

Collection Date: 10/29/20 16:25
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):90.3
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.82	J	4.75	1.42	mg/kg	1		11/07/20 00:05
Surrogates								
4-Bromofluorobenzene (surr)	81.7		50-150		%	1		11/07/20 00:05

Batch Information

Analytical Batch: VFC15441
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/07/20 00:05
Container ID: 1206052014-B

Prep Batch: VXX36661
Prep Method: SW5035A
Prep Date/Time: 10/29/20 16:25
Prep Initial Wt./Vol.: 32.904 g
Prep Extract Vol: 28.2038 mL

Results of **SS-15**

Client Sample ID: **SS-15**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052014
Lab Project ID: 1206052

Collection Date: 10/29/20 16:25
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):90.3
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0118	U	0.0237	0.00741	mg/kg	1		11/03/20 15:07
Ethylbenzene	0.0238	U	0.0475	0.0148	mg/kg	1		11/03/20 15:07
o-Xylene	0.0238	U	0.0475	0.0148	mg/kg	1		11/03/20 15:07
P & M -Xylene	0.0475	U	0.0950	0.0285	mg/kg	1		11/03/20 15:07
Toluene	0.0238	U	0.0475	0.0148	mg/kg	1		11/03/20 15:07
Xylenes (total)	0.0710	U	0.142	0.0433	mg/kg	1		11/03/20 15:07
Surrogates								
1,2-Dichloroethane-D4 (surr)	96.1		71-136		%	1		11/03/20 15:07
4-Bromofluorobenzene (surr)	85		55-151		%	1		11/03/20 15:07
Toluene-d8 (surr)	101		85-116		%	1		11/03/20 15:07

Batch Information

Analytical Batch: VMS20478
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 11/03/20 15:07
Container ID: 1206052014-B

Prep Batch: VXX36647
Prep Method: SW5035A
Prep Date/Time: 10/29/20 16:25
Prep Initial Wt./Vol.: 32.904 g
Prep Extract Vol: 28.2038 mL

Print Date: 12/01/2020 1:19:42PM

J flagging is activated

Results of **SS-16**

Client Sample ID: **SS-16**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052015
Lab Project ID: 1206052

Collection Date: 10/29/20 16:50
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):88.8
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	61.6		22.2	6.89	mg/kg	1		11/12/20 06:31
Surrogates								
5a Androstane (surr)	92.6		50-150		%	1		11/12/20 06:31

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/12/20 06:31
Container ID: 1206052015-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.408 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	779		111	47.8	mg/kg	1		11/12/20 06:31
Surrogates								
n-Triacontane-d62 (surr)	110		50-150		%	1		11/12/20 06:31

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/12/20 06:31
Container ID: 1206052015-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.408 g
Prep Extract Vol: 5 mL

Results of **SS-16**

Client Sample ID: **SS-16**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052015
Lab Project ID: 1206052

Collection Date: 10/29/20 16:50
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):88.8
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.05	J	4.86	1.46	mg/kg	1		11/07/20 02:08
Surrogates								
4-Bromofluorobenzene (surr)	84.7		50-150		%	1		11/07/20 02:08

Batch Information

Analytical Batch: VFC15441
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/07/20 02:08
Container ID: 1206052015-B

Prep Batch: VXX36661
Prep Method: SW5035A
Prep Date/Time: 10/29/20 16:50
Prep Initial Wt./Vol.: 33.32 g
Prep Extract Vol: 28.7454 mL

Results of **SS-16**

Client Sample ID: **SS-16**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052015
Lab Project ID: 1206052

Collection Date: 10/29/20 16:50
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):88.8
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0121	U	0.0243	0.00758	mg/kg	1		11/03/20 15:22
Ethylbenzene	0.0243	U	0.0486	0.0152	mg/kg	1		11/03/20 15:22
o-Xylene	0.0243	U	0.0486	0.0152	mg/kg	1		11/03/20 15:22
P & M -Xylene	0.0486	U	0.0972	0.0292	mg/kg	1		11/03/20 15:22
Toluene	0.0243	U	0.0486	0.0152	mg/kg	1		11/03/20 15:22
Xylenes (total)	0.0730	U	0.146	0.0443	mg/kg	1		11/03/20 15:22
Surrogates								
1,2-Dichloroethane-D4 (surr)	92.6		71-136		%	1		11/03/20 15:22
4-Bromofluorobenzene (surr)	90.7		55-151		%	1		11/03/20 15:22
Toluene-d8 (surr)	102		85-116		%	1		11/03/20 15:22

Batch Information

Analytical Batch: VMS20478
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 11/03/20 15:22
Container ID: 1206052015-B

Prep Batch: VXX36647
Prep Method: SW5035A
Prep Date/Time: 10/29/20 16:50
Prep Initial Wt./Vol.: 33.32 g
Prep Extract Vol: 28.7454 mL

Results of **SS-17**

Client Sample ID: **SS-17**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052016
Lab Project ID: 1206052

Collection Date: 10/29/20 19:55
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):90.3
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	31.4		21.9	6.78	mg/kg	1		11/12/20 06:41
Surrogates								
5a Androstane (surr)	99.4		50-150		%	1		11/12/20 06:41

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/12/20 06:41
Container ID: 1206052016-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.37 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	103	J	109	47.0	mg/kg	1		11/12/20 06:41
Surrogates								
n-Triacontane-d62 (surr)	110		50-150		%	1		11/12/20 06:41

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/12/20 06:41
Container ID: 1206052016-A

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/05/20 11:03
Prep Initial Wt./Vol.: 30.37 g
Prep Extract Vol: 5 mL

Print Date: 12/01/2020 1:19:42PM

J flagging is activated

Results of **SS-17**

Client Sample ID: **SS-17**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052016
Lab Project ID: 1206052

Collection Date: 10/29/20 19:55
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):90.3
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.56	J	4.91	1.47	mg/kg	1		11/07/20 00:40
Surrogates								
4-Bromofluorobenzene (surr)	82.6		50-150		%	1		11/07/20 00:40

Batch Information

Analytical Batch: VFC15441
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/07/20 00:40
Container ID: 1206052016-B

Prep Batch: VXX36661
Prep Method: SW5035A
Prep Date/Time: 10/29/20 19:55
Prep Initial Wt./Vol.: 31.668 g
Prep Extract Vol: 28.0626 mL

Results of **SS-17**

Client Sample ID: **SS-17**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052016
Lab Project ID: 1206052

Collection Date: 10/29/20 19:55
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):90.3
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0123	U	0.0245	0.00765	mg/kg	1		11/03/20 15:38
Ethylbenzene	0.0245	U	0.0491	0.0153	mg/kg	1		11/03/20 15:38
o-Xylene	0.0245	U	0.0491	0.0153	mg/kg	1		11/03/20 15:38
P & M -Xylene	0.0491	U	0.0981	0.0294	mg/kg	1		11/03/20 15:38
Toluene	0.0245	U	0.0491	0.0153	mg/kg	1		11/03/20 15:38
Xylenes (total)	0.0735	U	0.147	0.0447	mg/kg	1		11/03/20 15:38
Surrogates								
1,2-Dichloroethane-D4 (surr)	96.7		71-136		%	1		11/03/20 15:38
4-Bromofluorobenzene (surr)	87.7		55-151		%	1		11/03/20 15:38
Toluene-d8 (surr)	101		85-116		%	1		11/03/20 15:38

Batch Information

Analytical Batch: VMS20478
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 11/03/20 15:38
Container ID: 1206052016-B

Prep Batch: VXX36647
Prep Method: SW5035A
Prep Date/Time: 10/29/20 19:55
Prep Initial Wt./Vol.: 31.668 g
Prep Extract Vol: 28.0626 mL

Results of **TB2/PW7-30-5**

Client Sample ID: **TB2/PW7-30-5**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052017
Lab Project ID: 1206052

Collection Date: 10/29/20 13:00
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.03	J	2.55	0.766	mg/kg	1		11/06/20 13:12
Surrogates								
4-Bromofluorobenzene (surr)	83.3		50-150		%	1		11/06/20 13:12

Batch Information

Analytical Batch: VFC15441
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/06/20 13:12
Container ID: 1206052017-A

Prep Batch: VXX36660
Prep Method: SW5035A
Prep Date/Time: 10/29/20 13:00
Prep Initial Wt./Vol.: 48.981 g
Prep Extract Vol: 25 mL

Results of **TB2/PW7-30-5**

Client Sample ID: **TB2/PW7-30-5**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052017
Lab Project ID: 1206052

Collection Date: 10/29/20 13:00
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.00640	U	0.0128	0.00398	mg/kg	1		11/03/20 11:15
Ethylbenzene	0.0127	U	0.0255	0.00796	mg/kg	1		11/03/20 11:15
o-Xylene	0.0127	U	0.0255	0.00796	mg/kg	1		11/03/20 11:15
P & M -Xylene	0.0255	U	0.0510	0.0153	mg/kg	1		11/03/20 11:15
Toluene	0.0127	U	0.0255	0.00796	mg/kg	1		11/03/20 11:15
Xylenes (total)	0.0383	U	0.0766	0.0233	mg/kg	1		11/03/20 11:15
Surrogates								
1,2-Dichloroethane-D4 (surr)	93.5		71-136		%	1		11/03/20 11:15
4-Bromofluorobenzene (surr)	88.4		55-151		%	1		11/03/20 11:15
Toluene-d8 (surr)	101		85-116		%	1		11/03/20 11:15

Batch Information

Analytical Batch: VMS20478
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 11/03/20 11:15
Container ID: 1206052017-A

Prep Batch: VXX36647
Prep Method: SW5035A
Prep Date/Time: 10/29/20 13:00
Prep Initial Wt./Vol.: 48.981 g
Prep Extract Vol: 25 mL

Results of **TB1/PW7-30-8**

Client Sample ID: **TB1/PW7-30-8**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052018
Lab Project ID: 1206052

Collection Date: 10/24/20 04:00
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.933	J	2.52	0.755	mg/kg	1		11/06/20 13:29
Surrogates								
4-Bromofluorobenzene (surr)	82.9		50-150		%	1		11/06/20 13:29

Batch Information

Analytical Batch: VFC15441
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/06/20 13:29
Container ID: 1206052018-A

Prep Batch: VXX36660
Prep Method: SW5035A
Prep Date/Time: 10/24/20 04:00
Prep Initial Wt./Vol.: 49.678 g
Prep Extract Vol: 25 mL

Print Date: 12/01/2020 1:19:42PM

J flagging is activated

Results of **TB1/PW7-30-8**

Client Sample ID: **TB1/PW7-30-8**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206052018
Lab Project ID: 1206052

Collection Date: 10/24/20 04:00
Received Date: 11/02/20 16:04
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.00630	U	0.0126	0.00393	mg/kg	1		11/03/20 11:31
Ethylbenzene	0.0126	U	0.0252	0.00785	mg/kg	1		11/03/20 11:31
o-Xylene	0.0126	U	0.0252	0.00785	mg/kg	1		11/03/20 11:31
P & M -Xylene	0.0251	U	0.0503	0.0151	mg/kg	1		11/03/20 11:31
Toluene	0.0126	U	0.0252	0.00785	mg/kg	1		11/03/20 11:31
Xylenes (total)	0.0377	U	0.0755	0.0229	mg/kg	1		11/03/20 11:31
Surrogates								
1,2-Dichloroethane-D4 (surr)	94.7		71-136		%	1		11/03/20 11:31
4-Bromofluorobenzene (surr)	85.6		55-151		%	1		11/03/20 11:31
Toluene-d8 (surr)	101		85-116		%	1		11/03/20 11:31

Batch Information

Analytical Batch: VMS20478
Analytical Method: SW8260D
Analyst: KAJ
Analytical Date/Time: 11/03/20 11:31
Container ID: 1206052018-A

Prep Batch: VXX36647
Prep Method: SW5035A
Prep Date/Time: 10/24/20 04:00
Prep Initial Wt./Vol.: 49.678 g
Prep Extract Vol: 25 mL

Method Blank

Blank ID: MB for HBN 1813867 [SPT/11173]
Blank Lab ID: 1591386

Matrix: Soil/Solid (dry weight)

QC for Samples:
1206052001, 1206052002, 1206052003, 1206052004, 1206052005, 1206052006, 1206052007, 1206052008, 1206052009, 1206052010, 1206052011, 1206052012, 1206052013, 1206052014, 1206052015, 1206052016

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT11173
Analytical Method: SM21 2540G
Instrument:
Analyst: H.M
Analytical Date/Time: 11/3/2020 6:36:00PM

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Duplicate Sample Summary

Original Sample ID: 1205959005
Duplicate Sample ID: 1591389
QC for Samples:

Analysis Date: 11/03/2020 18:36
Matrix: Soil/Solid (dry weight)

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	93.2	93.4	%	0.25	(< 15)

Batch Information

Analytical Batch: SPT11173
Analytical Method: SM21 2540G
Instrument:
Analyst: H.M

Print Date: 12/01/2020 1:19:48PM

Duplicate Sample Summary

Original Sample ID: 1205999016
Duplicate Sample ID: 1591390

Analysis Date: 11/03/2020 18:36
Matrix: Soil/Solid (dry weight)

QC for Samples:

1206052001, 1206052002, 1206052003, 1206052004, 1206052005, 1206052006, 1206052007, 1206052008, 1206052009, 1206052010, 1206052011, 1206052012, 1206052013, 1206052014, 1206052015, 1206052016

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	90.3	89.9	%	0.37	(< 15)

Batch Information

Analytical Batch: SPT11173
Analytical Method: SM21 2540G
Instrument:
Analyst: H.M

Print Date: 12/01/2020 1:19:48PM

Duplicate Sample Summary

Original Sample ID: 1209777001
Duplicate Sample ID: 1591391

Analysis Date: 11/03/2020 18:36
Matrix: Soil/Solid (dry weight)

QC for Samples:

1206052001, 1206052002, 1206052003, 1206052004, 1206052005, 1206052006, 1206052007, 1206052008, 1206052009, 1206052010, 1206052011, 1206052012, 1206052013, 1206052014, 1206052015, 1206052016

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	85.6	86.0	%	0.49	(< 15)

Batch Information

Analytical Batch: SPT11173
Analytical Method: SM21 2540G
Instrument:
Analyst: H.M

Print Date: 12/01/2020 1:19:48PM

Method Blank

Blank ID: MB for HBN 1813903 [VXX/36647]
Blank Lab ID: 1591538

Matrix: Soil/Solid (dry weight)

QC for Samples:
1206052001, 1206052002, 1206052003, 1206052004, 1206052005, 1206052006, 1206052007, 1206052008, 1206052009, 1206052010, 1206052011, 1206052012, 1206052013, 1206052014, 1206052015, 1206052016, 1206052017, 1206052018

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.00625U	0.0125	0.00390	mg/kg
Ethylbenzene	0.0125U	0.0250	0.00780	mg/kg
o-Xylene	0.0125U	0.0250	0.00780	mg/kg
P & M -Xylene	0.0250U	0.0500	0.0150	mg/kg
Toluene	0.0125U	0.0250	0.00780	mg/kg
Xylenes (total)	0.0375U	0.0750	0.0228	mg/kg
Surrogates				
1,2-Dichloroethane-D4 (surr)	97	71-136		%
4-Bromofluorobenzene (surr)	95.6	55-151		%
Toluene-d8 (surr)	98.9	85-116		%

Batch Information

Analytical Batch: VMS20478
Analytical Method: SW8260D
Instrument: VRA Agilent GC/MS 7890B/5977A
Analyst: KAJ
Analytical Date/Time: 11/3/2020 8:07:00AM

Prep Batch: VXX36647
Prep Method: SW5035A
Prep Date/Time: 11/3/2020 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1206052 [VXX36647]
Blank Spike Lab ID: 1591539
Date Analyzed: 11/03/2020 09:10

Matrix: Soil/Solid (dry weight)

QC for Samples: 1206052001, 1206052002, 1206052003, 1206052004, 1206052005, 1206052006, 1206052007, 1206052008, 1206052009, 1206052010, 1206052011, 1206052012, 1206052013, 1206052014, 1206052015, 1206052016, 1206052017, 1206052018

Results by **SW8260D**

Blank Spike (mg/kg)

Parameter	Spike	Result	Rec (%)	CL
Benzene	0.750	0.765	102	(77-121)
Ethylbenzene	0.750	0.768	102	(76-122)
o-Xylene	0.750	0.774	103	(77-123)
P & M -Xylene	1.50	1.49	99	(77-124)
Toluene	0.750	0.748	100	(77-121)
Xylenes (total)	2.25	2.26	100	(78-124)
Surrogates				
1,2-Dichloroethane-D4 (surr)	0.750	91.8	92	(71-136)
4-Bromofluorobenzene (surr)	0.750	99.3	99	(55-151)
Toluene-d8 (surr)	0.750	102	102	(85-116)

Batch Information

Analytical Batch: **VMS20478**
Analytical Method: **SW8260D**
Instrument: **VRA Agilent GC/MS 7890B/5977A**
Analyst: **KAJ**

Prep Batch: **VXX36647**
Prep Method: **SW5035A**
Prep Date/Time: **11/03/2020 06:00**
Spike Init Wt./Vol.: 0.750 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1591542
MS Sample ID: 1591540 MS
MSD Sample ID: 1591541 MSD

Analysis Date: 11/03/2020 11:46
Analysis Date: 11/03/2020 9:43
Analysis Date: 11/03/2020 9:58
Matrix: Soil/Solid (dry weight)

QC for Samples: 1206052001, 1206052002, 1206052003, 1206052004, 1206052005, 1206052006, 1206052007, 1206052008, 1206052009, 1206052010, 1206052011, 1206052012, 1206052013, 1206052014, 1206052015, 1206052016, 1206052017, 1206052018

Results by **SW8260D**

		Matrix Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	0.00805U	0.965	0.981	102	0.965	1.01	105	77-121	3.10	(< 20)
Ethylbenzene	0.0162U	0.965	0.974	101	0.965	1.02	105	76-122	4.50	(< 20)
o-Xylene	0.0162U	0.965	0.962	100	0.965	1.02	106	77-123	5.80	(< 20)
P & M -Xylene	0.0323U	1.93	1.90	99	1.93	2.00	104	77-124	5.10	(< 20)
Toluene	0.0162U	0.965	0.948	98	0.965	0.981	102	77-121	3.40	(< 20)
Xylenes (total)	0.0484U	2.90	2.87	99	2.90	3.02	104	78-124	5.30	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		0.965	0.881	91	0.965	0.915	95	71-136	3.70	
4-Bromofluorobenzene (surr)		1.39	1.28	92	1.39	1.30	94	55-151	1.80	
Toluene-d8 (surr)		0.965	0.974	101	0.965	0.976	101	85-116	0.16	

Batch Information

Analytical Batch: VMS20478
Analytical Method: SW8260D
Instrument: VRA Agilent GC/MS 7890B/5977A
Analyst: KAJ
Analytical Date/Time: 11/3/2020 9:43:00AM

Prep Batch: VXX36647
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 11/3/2020 6:00:00AM
Prep Initial Wt./Vol.: 45.06g
Prep Extract Vol: 29.06mL

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Method Blank

Blank ID: MB for HBN 1814035 [VXX/36660]
Blank Lab ID: 1592217

Matrix: Soil/Solid (dry weight)

QC for Samples:
1206052017, 1206052018

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.957J	2.50	0.750	mg/kg
Surrogates				
4-Bromofluorobenzene (surr)	97.5	50-150		%

Batch Information

Analytical Batch: VFC15441
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ALJ
Analytical Date/Time: 11/6/2020 12:54:00PM

Prep Batch: VXX36660
Prep Method: SW5035A
Prep Date/Time: 11/6/2020 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1206052 [VXX36660]
Blank Spike Lab ID: 1592218
Date Analyzed: 11/06/2020 12:19

Spike Duplicate ID: LCSD for HBN 1206052 [VXX36660]
Spike Duplicate Lab ID: 1592219
Matrix: Soil/Solid (dry weight)

QC for Samples: 1206052017, 1206052018

Results by **AK101**

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	13.0	104	12.5	13.3	106	(60-120)	1.80	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	98.7	99	1.25	102	102	(50-150)	2.90	

Batch Information

Analytical Batch: **VFC15441**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36660**
Prep Method: **SW5035A**
Prep Date/Time: **11/06/2020 06:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1814035 [VXX/36661]
Blank Lab ID: 1927773

Matrix: Soil/Solid (dry weight)

QC for Samples:
1706097001, 1706097007, 1706097003, 1706097004, 1706097009, 1706097006, 1706097005, 1706097008, 1706097002, 1706097010, 1706097011, 1706097017, 1706097013, 1706097014, 1706097019, 1706097016

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.247J	7.90	0.590	mg/kg
Surrogates				
4-Bromofluorobenzene (surr)	101	90-190		%

Batch Information

Analytical Batch: VFC19441
Analytical Method: AK101
Instrument: Agilent 5820A PID/FID
Analyst: ALJ
Analytical Date/Time: 11/6/7070 5:98:00PM

Prep Batch: VXX36661
Prep Method: SW9039A
Prep Date/Time: 11/6/7070 6:00:00AM
Prep Initial Wt./Vol.: 90 g
Prep Extract Vol: 79 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1206052 [VXX36661]
Blank Spike Lab ID: 1592228
Date Analyzed: 11/06/2020 19:23

Spike Duplicate ID: LCSD for HBN 1206052 [VXX36661]
Spike Duplicate Lab ID: 1592225
Matrix: Soil/Solid (dry weight)

QC for Samples: 120605200171206052002712060520037120605200871206052005712060520067120605200, 7 120605200G71206052009712060520107120605201171206052012712060520137120605201871206052015712060520 16

Results by **AK101**

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Oasoline Range . rganics	1245	1340	108	1245	1249	103	(60-120)	0435	(< 20)
Surrogates									
8-Bromofluorobenzene (surr)	1425	105	105	1425	105	105	(50-150)	0419	

Batch Information

Analytical Batch: **VFC15441**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36661**
Prep Method: **SW5035A**
Prep Date/Time: **11/06/2020 06:00**
Spike Init Wt4Vol4 1245 mg/Kg Extract Vol: 25 mL
Dupe Init Wt4Vol4 1245 mg/Kg Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1813936 [XXX/44193]
Blank Lab ID: 1591725

Matrix: Soil/Solid (dry weight)

QC for Samples:
1206052001, 1206052002, 1206052003, 1206052004, 1206052005, 1206052006, 1206052007, 1206052008, 1206052009, 1206052010, 1206052011, 1206052012, 1206052013, 1206052014, 1206052015, 1206052016

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	10.0U	20.0	6.20	mg/kg
Surrogates				
5a Androstane (surr)	101	60-120		%

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: CDM
Analytical Date/Time: 11/11/2020 2:14:00PM

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/Time: 11/5/2020 11:03:15AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1206052 [XXX44193]
Blank Spike Lab ID: 1591726
Date Analyzed: 11/11/2020 14:24

Spike Duplicate ID: LCSD for HBN 1206052 [XXX44193]
Spike Duplicate Lab ID: 1591727
Matrix: Soil/Solid (dry weight)

QC for Samples: 1206052001, 1206052002, 1206052003, 1206052004, 1206052005, 1206052006, 1206052007, 1206052008, 1206052009, 1206052010, 1206052011, 1206052012, 1206052013, 1206052014, 1206052015, 1206052016

Results by **AK102**

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	833	812	97	833	771	93	(75-125)	5.10	(< 20)
Surrogates									
5a Androstane (surr)	16.7	110	110	16.7	107	107	(60-120)	2.70	

Batch Information

Analytical Batch: **XFC15809**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **CDM**

Prep Batch: **XXX44193**
Prep Method: **SW3550C**
Prep Date/Time: **11/05/2020 11:03**
Spike Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1813936 [XXX/44193]
Blank Lab ID: 1591725

Matrix: Soil/Solid (dry weight)

QC for Samples:
1206052001, 1206052002, 1206052003, 1206052004, 1206052005, 1206052006, 1206052007, 1206052008, 1206052009, 1206052010, 1206052011, 1206052012, 1206052013, 1206052014, 1206052015, 1206052016

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	50.0U	100	43.0	mg/kg
Surrogates				
nA riacontaneAd62 (surr)	111	60A120		%

Batch Information

Fnalytical Batch: XKC15809
Fnalytical Method: FT103
Instrument: Fgilent 7890B K
Fnalyst: CDM
Fnalytical Date/- ime: 11/11/2020 2:14:00PM

Prep Batch: XXX44193
Prep Method: SW3550C
Prep Date/- ime: 11/5/2020 11:03:15FM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1206052 [XXX44193]
Blank Spike Lab ID: 1591726
Date Analyzed: 11/11/2020 14:24

Spike Duplicate ID: LCSD for HBN 1206052 [XXX44193]
Spike Duplicate Lab ID: 1591727
Matrix: Soil/Solid (dry weight)

QC for Samples: 1206052001, 1206052002, 1206052003, 1206052004, 1206052005, 1206052006, 1206052007, 1206052008, 1206052009, 1206052010, 1206052011, 1206052012, 1206052013, 1206052014, 1206052015, 1206052016

Results by **AK103**

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Residual Range Organics	833	954	115	833	920	110	(60-120)	3.70	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	16.7	113	113	16.7	113	113	(60-120)	0.42	

Batch Information

Analytical Batch: **XFC15809**
Analytical Method: **AK103**
Instrument: **Agilent 7890B F**
Analyst: **CDM**

Prep Batch: **XXX44193**
Prep Method: **SW3550C**
Prep Date/Time: **11/05/2020 11:03**
Spike Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1813986 [XXX/44200]
Blank Lab ID: 1591949

Matrix: Soil/Solid (dry weight)

QC for Samples:
1206052004, 1206052005, 1206052011

Results by **8270D SIM (PAH)**

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	0.0125U	0.0250	0.00625	mg/kg
2-Methylnaphthalene	0.0125U	0.0250	0.00625	mg/kg
Acenaphthene	0.0125U	0.0250	0.00625	mg/kg
Acenaphthylene	0.0125U	0.0250	0.00625	mg/kg
Anthracene	0.0125U	0.0250	0.00625	mg/kg
Benzo(a)Anthracene	0.0125U	0.0250	0.00625	mg/kg
Benzo[a]pyrene	0.0125U	0.0250	0.00625	mg/kg
Benzo[b]Fluoranthene	0.0125U	0.0250	0.00625	mg/kg
Benzo[g,h,i]perylene	0.0125U	0.0250	0.00625	mg/kg
Benzo[k]fluoranthene	0.0125U	0.0250	0.00625	mg/kg
Chrysene	0.0125U	0.0250	0.00625	mg/kg
Dibenzo[a,h]anthracene	0.0125U	0.0250	0.00625	mg/kg
Fluoranthene	0.0125U	0.0250	0.00625	mg/kg
Fluorene	0.0125U	0.0250	0.00625	mg/kg
Indeno[1,2,3-c,d] pyrene	0.0125U	0.0250	0.00625	mg/kg
Naphthalene	0.0100U	0.0200	0.00500	mg/kg
Phenanthrene	0.0125U	0.0250	0.00625	mg/kg
Pyrene	0.0125U	0.0250	0.00625	mg/kg
Surrogates				
2-Methylnaphthalene-d10 (surr)	81.7	58-103		%
Fluoranthene-d10 (surr)	88.7	54-113		%

Batch Information

Analytical Batch: XMS12422
Analytical Method: 8270D SIM (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: DSD
Analytical Date/Time: 11/25/2020 1:33:00PM

Prep Batch: XXX44200
Prep Method: SW3550C
Prep Date/Time: 11/6/2020 11:59:13AM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1206052 [XXX44200]
Blank Spike Lab ID: 1591950
Date Analyzed: 11/25/2020 13:53

Matrix: Soil/Solid (dry weight)

QC for Samples: 1206052004, 1206052005, 1206052011

Results by **8270D SIM (PAH)**

Blank Spike (mg/kg)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	0.111	0.0972	87	(43-111)
2-Methylnaphthalene	0.111	0.0998	90	(39-114)
Acenaphthene	0.111	0.0960	86	(44-111)
Acenaphthylene	0.111	0.0943	85	(39-116)
Anthracene	0.111	0.0882	79	(50-114)
Benzo(a)Anthracene	0.111	0.0915	82	(54-122)
Benzo[a]pyrene	0.111	0.0882	79	(50-125)
Benzo[b]Fluoranthene	0.111	0.0986	89	(53-128)
Benzo[g,h,i]perylene	0.111	0.0903	81	(49-127)
Benzo[k]fluoranthene	0.111	0.0926	83	(56-123)
Chrysene	0.111	0.0969	87	(57-118)
Dibenzo[a,h]anthracene	0.111	0.0914	82	(50-129)
Fluoranthene	0.111	0.104	94	(55-119)
Fluorene	0.111	0.0972	88	(47-114)
Indeno[1,2,3-c,d] pyrene	0.111	0.0981	88	(49-130)
Naphthalene	0.111	0.0992	89	(38-111)
Phenanthrene	0.111	0.0955	86	(49-113)
Pyrene	0.111	0.100	90	(55-117)
Surrogates				
2-Methylnaphthalene-d10 (surr)	0.111	85.6	86	(58-103)
Fluoranthene-d10 (surr)	0.111	87.3	87	(54-113)

Batch Information

Analytical Batch: **XMS12422**
Analytical Method: **8270D SIM (PAH)**
Instrument: **SVA Agilent 780/5975 GC/MS**
Analyst: **DSD**

Prep Batch: **XXX44200**
Prep Method: **SW3550C**
Prep Date/Time: **11/06/2020 11:59**
Spike Init Wt./Vol.: 0.111 mg/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1206025007
MS Sample ID: 1591951 MS
MSD Sample ID: 1591952 MSD

Analysis Date: 11/25/2020 16:17
Analysis Date: 11/25/2020 16:37
Analysis Date: 11/25/2020 16:58
Matrix: Soil/Solid (dry weight)

QC for Samples: 1206052004, 1206052005, 1206052011

Results by **8270D SIM (PAH)**

		Matrix Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	0.0144U	0.127	0.104	82	0.127	0.104	82	43-111	0.04	(< 20)
2-Methylnaphthalene	0.0144U	0.127	0.106	84	0.127	0.105	83	39-114	0.92	(< 20)
Acenaphthene	0.0144U	0.127	0.0999	79	0.127	0.0988	78	44-111	1.00	(< 20)
Acenaphthylene	0.0144U	0.127	0.104	82	0.127	0.102	81	39-116	1.40	(< 20)
Anthracene	0.0144U	0.127	0.0963	76	0.127	0.0962	76	50-114	0.19	(< 20)
Benzo(a)Anthracene	0.0144U	0.127	0.0965	76	0.127	0.0977	77	54-122	1.20	(< 20)
Benzo[a]pyrene	0.0144U	0.127	0.103	81	0.127	0.103	81	50-125	0.03	(< 20)
Benzo[b]Fluoranthene	0.0144U	0.127	0.103	81	0.127	0.105	83	53-128	2.30	(< 20)
Benzo[g,h,i]perylene	0.0144U	0.127	0.0933	74	0.127	0.0933	74	49-127	0.02	(< 20)
Benzo[k]fluoranthene	0.0144U	0.127	0.0953	75	0.127	0.0957	75	56-123	0.43	(< 20)
Chrysene	0.0144U	0.127	0.0999	79	0.127	0.101	80	57-118	1.30	(< 20)
Dibenzo[a,h]anthracene	0.0144U	0.127	0.0965	76	0.127	0.0958	75	50-129	0.72	(< 20)
Fluoranthene	0.0144U	0.127	0.108	85	0.127	0.110	86	55-119	2.00	(< 20)
Fluorene	0.0144U	0.127	0.0998	79	0.127	0.0995	78	47-114	0.28	(< 20)
Indeno[1,2,3-c,d] pyrene	0.0144U	0.127	0.103	81	0.127	0.103	81	49-130	0.20	(< 20)
Naphthalene	0.0115U	0.127	0.103	81	0.127	0.104	81	38-111	0.70	(< 20)
Phenanthrene	0.0144U	0.127	0.0984	78	0.127	0.0986	78	49-113	0.24	(< 20)
Pyrene	0.0144U	0.127	0.106	84	0.127	0.107	84	55-117	0.93	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		0.127	0.0973	77	0.127	0.0983	77	58-103	0.95	
Fluoranthene-d10 (surr)		0.127	0.0993	78	0.127	0.101	80	54-113	1.80	

Batch Information

Analytical Batch: XMS12422
Analytical Method: 8270D SIM (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: DSD
Analytical Date/Time: 11/25/2020 4:37:00PM

Prep Batch: XXX44200
Prep Method: Sonication Extr Soil 8270 PAH SIM 5ml
Prep Date/Time: 11/6/2020 11:59:13AM
Prep Initial Wt./Vol.: 22.75g
Prep Extract Vol: 5.00mL

Print Date: 12/01/2020 1:22:03PM

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CHAIN-OF-CUSTODY RECORD

Laboratory SGS
Attn: Jen Dawkins

1206052

Turn Around Time: [X] Normal [ ] Rush — Please Specify

Quote No: —

J-Flags: [X] Yes [ ] No

Analytical Methods (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	DRO (AK 102)	RRO (AK 103)	GRO (AK 101)/BTEX (8260D)	PAHs (EPA 8270D SIM)				Total No.	Remarks/Matrix Composition/Grab? Sample Containers
ARFF-SB1-03	(1AB)	0400	10/24/20	X	X	X					2	Soil
ARFF-SB2-03	(2AB)	0455	↓	X	X	X					2	
10-28-SB4-03	(3AB)	0330	10/25/20	X	X	X					2	↓
~~ANG-ARFF-TWP-01~~			~~10/27/20~~	~~X~~	~~X~~	~~X~~						~~water (low volume)~~
~~ANG-TWP-02~~			↓	~~X~~	~~X~~	~~X~~						~~↓ (low volume)~~
ARFF-SB3-03	(4AB)	1650	10/26/20	X	X	X	X				2	Soil
ARFF-SB3-13	(5AB)	16:40		X	X	X	X				2	↓
ARFF-SB4-03	(6AB)	19:45	↓	X	X	X					2	↓
~~AKA-SB1~~			~~10/27/20~~									
SS-08	(7AB)	12:30	10/24/20	X	X	X					2	Soil

Project Information		Sample Receipt	
Number:	105745-002	Total No. of Containers:	34
Name:	~~ARFF~~ DOD PFC Name	COC Seals/Intact? Y/N/NA	
Contact:	MDN	Received Good Cond./Cold	
Ongoing Project?	Yes [X] No [ ]	Temp:	
Sampler:	MDN/APL/VTY	Delivery Method:	Goldstreak

Notes:

Please bill to 105745-003
Samples ARFF-SB1-03, ARFF-SB2-03, and 10-28-SB4-03 (3 samples)
Bill remaining to 105745-002 (13 samples)

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: [signature] Time: 1330	Signature: Time:	Signature: Time:
Printed Name: Marcy Nadel Date: 11/1/20	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson, Inc.	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time:	Signature: Time:	Signature: [signature] Time: 1604 MA
Printed Name: Date:	Printed Name: Date:	Printed Name: Michelle Alberson Date: 11/2/20 MA, IF, ILS
Company:	Company:	Company: SGS 5.1 DSO

Distribution: White - w/shipment returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

P# 350732 >10

No. 36149

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

CHAIN-OF-CUSTODY RECORD

Laboratory SGS
Attn: Jen Dawkins

400 N. 34th Street, Suite 100
Seattle, WA 98103
(206) 632-8020

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600

2855 S.W. Canyon Road
Portland, OR 97201-2498
(503) 223-6147

2043 Westport Center Drive
St. Louis, MO 63146-3564
(314) 699-9660

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

1200 17th Street, Suite 1024
Denver, Co 80202
(303) 825-3800

303 Wellsian Way
Richland, WA 99352
(509) 946-6309

1206052

Analysis Parameters/Sample Container Description (include preservative used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	DRO (AK 102)	RRO (AK 103)	GRO (AK 101)	BTEX (8260D)	PAHs (8270D)	Total No. of C	
SS-09	8AB	13:00	10/29/20		X	X	X	X	X			2	Soil
SS-10	9AB	2030			X	X	X	X	X			2	
SS-11	10AB	2035			X	X	X	X	X			2	
SS-12	11AB	2100			X	X	X	X	X	X		2	
SS-13	12AB	1535			X	X	X	X	X			2	
SS-14	13AB	1605			X	X	X	X	X			2	
SS-15	14AB	1625			X	X	X	X	X			2	
SS-16	15AB	1650			X	X	X	X	X			2	
SS-17	16AB	1955			X	X	X	X	X			2	
*TB2/PW7-30-5	(for 10/29/20)				—			X	X			1	Trip Blank (17A)

Project Information	Sample Receipt
Project Number:	Total Number of Containers
Project Name:	COC Seals/Intact? Y/N/NA
Contact:	Received Good Cond./Cold
Ongoing Project? Yes ☐ No ☐	Delivery Method:
Sampler:	(attach shipping bill, if any)

Instructions
Requested Turnaround Time:
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: Time: 1330	Signature: Time:	Signature: Time:
Printed Name: Marcy Nadel Date: 11/1/20	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time:	Signature: Time:	Signature: Time: 1604
Printed Name: Date:	Printed Name: Date:	Printed Name: Michelle Allerton Date: 11/2/20
Company:	Company:	Company: Alert, HF/LS
		SGS 5.1 DSO

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

F-19-91/UR

*TB2 stored in same cooler as 10/29/20 samples until shipment.

No. 30000

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

400 N. 34th Street, Suite 100, Seattle, WA 98103, (206) 632-8020
2355 Hill Road, Fairbanks, AK 99709, (907) 479-0600
2255 S.W. Canyon Road, Portland, OR 97201-2498, (503) 223-6147
2043 Westport Center Drive, St. Louis, MO 63146-3564, (314) 699-9660
5430 Fairbanks Street, Suite 3, Anchorage, AK 99518, (907) 561-2120
1200 17th Street, Suite 1024, Denver, Co 80202, (303) 825-3800
303 Wellsian Way, Richland, WA 99352, (509) 946-6309

CHAIN-OF-CUSTODY RECORD

Laboratory: Jen Dawkins
Attn: SGS

1206052

Analysis Parameters/Sample Container Descript (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	GRO (AK 101)	BTEX (8260D)					Total No. of C	Remarks/Matrix
*TB1/PW7-3098	(18A) (-Gr	10/24/20 to 10/26/20		–		X	X					1	Trip Blank

Project Information	
Project Number:	
Project Name:	
Contact:	
Ongoing Project? Yes ☐ No ☒	
Sampler:	

Sample Receipt	
Total Number of Containers	
COC Seals/Intact? Y/N/NA	
Received Good Cond./Cold	
Delivery Method: (attach shipping bill, if any)	

Instructions

Requested Turnaround Time:
Special Instructions:

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: [signature] Time: 1330	Signature: Time:	Signature: Time:
Printed Name: Marcy Nadel Date: 11/1/20	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time:	Signature: Time:	Signature: Michelle [signature] Time: 1604
Printed Name: Date:	Printed Name: Date:	Printed Name: [signature] Date: 11/2/20
Company:	Company:	Company: SGS 5.1 D50

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

F-19-91/UR

No. 30000

*TB1 stored in same cooler as 10/24, 10/25, and 10/26 samples prior to shipment.

Alert Expeditors Inc.

#407199

Citywide Delivery • 440-3351
8421 Flamingo Drive • Anchorage, Alaska 99502

Date 11/2/2020

From Macy Natal

To Dr McMains (565)

Collect ☐	Prepay ☐	Advance Charges ☐
Job # DME	PO# AS 5130 7053	

2 of 4

Water Sample

Shipped Signature

Total Charge

Received By:

e-Sample Receipt Form

SGS Workorder #: **1206052**

1 2 0 6 0 5 2

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements	N/A	Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	Yes	1F,1LS
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
N/A **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 5.1 °C Therm. ID: D50
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	Yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	Yes	
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
	N/A	***Exemption permitted for metals (e.g,200.8/6020B).
Were proper containers (type/mass/volume/preservative***)used?	Yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	Yes	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1206052001-A	No Preservative Required	OK			
1206052001-B	Methanol field pres. 4 C	OK			
1206052002-A	No Preservative Required	OK			
1206052002-B	Methanol field pres. 4 C	OK			
1206052003-A	No Preservative Required	OK			
1206052003-B	Methanol field pres. 4 C	OK			
1206052004-A	No Preservative Required	OK			
1206052004-B	Methanol field pres. 4 C	OK			
1206052005-A	No Preservative Required	OK			
1206052005-B	Methanol field pres. 4 C	OK			
1206052006-A	No Preservative Required	OK			
1206052006-B	Methanol field pres. 4 C	OK			
1206052007-A	No Preservative Required	OK			
1206052007-B	Methanol field pres. 4 C	OK			
1206052008-A	No Preservative Required	OK			
1206052008-B	Methanol field pres. 4 C	OK			
1206052009-A	No Preservative Required	OK			
1206052009-B	Methanol field pres. 4 C	OK			
1206052010-A	No Preservative Required	OK			
1206052010-B	Methanol field pres. 4 C	OK			
1206052011-A	No Preservative Required	OK			
1206052011-B	Methanol field pres. 4 C	OK			
1206052012-A	No Preservative Required	OK			
1206052012-B	Methanol field pres. 4 C	OK			
1206052013-A	No Preservative Required	OK			
1206052013-B	Methanol field pres. 4 C	OK			
1206052014-A	No Preservative Required	OK			
1206052014-B	Methanol field pres. 4 C	OK			
1206052015-A	No Preservative Required	OK			
1206052015-B	Methanol field pres. 4 C	OK			
1206052016-A	No Preservative Required	OK			
1206052016-B	Methanol field pres. 4 C	OK			
1206052017-A	Methanol field pres. 4 C	OK			
1206052018-A	Methanol field pres. 4 C	OK			

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
QN - Insufficient sample quantity provided.

Laboratory Data Review Checklist

Completed By:

Amber Masters

Title:

Environmental Scientist

Date:

12/16/2020

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

SGS North America, Inc.

Laboratory Report Number:

1206052

Laboratory Report Date:

2020.12.02

CS Site Name:

Nome Airport Statewide PFAS

ADEC File Number:

400.38.056

Hazard Identification Number:

27154

1206052

Laboratory Report Date:

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☒ No☐ N/A☐ Comments:

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☐ No☐ N/A☒ Comments:

   The requested analyses were conducted by the SGS North America Laboratory in Anchorage, AK.

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:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☒ No☐ N/A☐ Comments:

   c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

   Yes☒ No☐ N/A☐ Comments:

   The sample receipt form notes that the samples arrived in good condition with a cooler temperature of 5.1°C.

Laboratory Report Date:

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:

No discrepancies were noted by the laboratory in the sample receipt documentation.

e. Data quality or usability affected?

Comments:

The data quality and/or usability was not affected; see above.

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:

There were no discrepancies noted by the laboratory in the case narrative.

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

No corrective actions were required; see above.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

The case narrative does not specify an effect on data quality/usability.

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:

1206052

Laboratory Report Date:

c. All soils reported on a dry weight basis?

Yes☒ No☐ N/A☐ Comments:

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes☒ No☐ N/A☐ Comments:

The reporting limit (RL) is less than the applicable DEC regulatory limits for the project.

e. Data quality or usability affected?

The data quality and/or usability was not affected; see above.

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 limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

Gasoline range organics (GRO) were detected at estimated concentrations in the AK101 method blank samples associated with preparation batch VXX36660 and VXX36661.

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

Samples *ARFF-SB1-03, ARFF-SB2-03, 10-28-SB4-03, ARFF-SB3-03, ARFF-SB1-13, ARFF-SB4-03, SS-08, SS-09, SS-10, SS-11, SS-12,, SS-13, SS-14, SS-15, SS-16* and *SS-17* are included in preparation batch VXX36661. Preparation batch VXX36660 included trip blanks *TB2/PW7-30-5* and *TB1/PW7-30-8*. All field samples and the associated trip blanks contained estimated GRO concentrations within five times that of the concentrations detected 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:

The GRO results of all the field samples and the associated trip blanks are believed to be false-positives attributable to laboratory contamination. These results have been flagged 'UB' at the LOQ or detected concentration (whichever is greater) in the analytical tables.

v. Data quality or usability affected?

Comments:

The data quality/usability is affected. See above.

Laboratory Report Date:

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes☒ No☐ N/A☐ Comments:

An LCS was reported for methods SW8260D and SW8270D SIM.

An LCS/LCSD pair was reported for methods AK101, AK102, and AK103.

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

Metals and/or inorganics were not analyzed as part of this work order.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

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. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

An LCSD was not reported for methods SW8260D nor SW8270D SIM; refer to MS/MSD results for assessment of method precision.

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

NA; method accuracy and precision (where applicable) 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 of the data was not required; see above.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and/or usability was not affected; see above.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

An MS/MSD pair was reported for methods SW8260D and SW8270D SIM.

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

Metals and/or inorganics were not analyzed as part of 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 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:

NA; 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 of the data was not required; see above.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and/or usability was not 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:

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:

There were no surrogate recovery failures associated with this work order.

iv. Data quality or usability affected?

Comments:

The data quality and/or usability was 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:

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes☒ No☐ N/A☐ Comments:

TB2/PW7-30-5 and *TB1/PW7-30-8* were included with this work order

iii. All results less than LOQ and project specified objectives?

Yes☒ No☐ N/A☐ Comments:

GRO was detected at estimated concentrations in trip blanks *TB2/PW7-30-5* and *TB1/PW7-30-8*.

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

The trip blank samples were analyzed in the same preparation batches that exhibited GRO contamination in the associated method blanks. Since the detected concentrations were roughly equivalent to those found in the method blanks, the trip blank detections are believed to be false-positives.

v. Data quality or usability affected?

Comments:

The data quality and/or usability was not affected; see above.

1206052

Laboratory Report Date:

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☒ No☐ N/A☐ Comments:

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

The field duplicate pairs *ARFF-SB3-13 / ARFF-SB3-03* and *SS-10 / SS-11* were submitted with this work order.

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:

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

The data quality and/or usability was not affected; see above.

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes☐ No☐ N/A☒ Comments:

Samples were collected using non-reusable equipment, equipment blanks are not required.

i. All results less than LOQ and project specified objectives?

Yes☐ No☐ N/A☒ Comments:

See above.

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

N/A; see above.

iii. Data quality or usability affected?

Comments:

No; see above.

1206052

Laboratory Report Date:

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

   a. Defined and appropriate?

      Yes☐ No☐ N/A☒ Comments:

Laboratory Report of Analysis

To: Shannon & Wilson-Fairbanks
2355 Hill Rd
Fairbanks, AK 99707
(907)479-0600

Report Number: **1206053**

Client Project: **105745 DOT&PF Nome**

Dear Marcy Nadel,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Jennifer at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Stephen C. Ede
2020.11.30
13:26:59 -09'00'

Jennifer Dawkins Date
Project Manager
Jennifer.Dawkins@sgs.com

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Case Narrative

SGS Client: **Shannon & Wilson-Fairbanks**
SGS Project: **1206053**
Project Name/Site: **105745 DOT&PF Nome**
Project Contact: **Marcy Nadel**

Refer to sample receipt form for information on sample condition.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. The results apply to the samples as received. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020B, 7470A, 7471B, 8015C, 8021B, 8082A, 8260D, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
TNTC	Too Numerous To Count
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
ANG-TWP-01	1206053001	10/27/2020	11/02/2020	Water (Surface, Eff., Ground)
ANG-TWP-02	1206053002	10/27/2020	11/02/2020	Water (Surface, Eff., Ground)
Trip Blank 1	1206053003	10/27/2020	11/02/2020	Water (Surface, Eff., Ground)
OME-MW02-15	1206053004	10/31/2020	11/02/2020	Water (Surface, Eff., Ground)
OME-MW03-15	1206053005	10/31/2020	11/02/2020	Water (Surface, Eff., Ground)
OME-MW01-15	1206053006	10/31/2020	11/02/2020	Water (Surface, Eff., Ground)
EB-MW01-15	1206053007	10/27/2020	11/02/2020	Water (Surface, Eff., Ground)
Trip Blank 2	1206053008	10/31/2020	11/02/2020	Water (Surface, Eff., Ground)

Method	Method Description
8270D SIM LV (PAH)	8270 PAH SIM GC/MS LV
AK102	DRO/RRO Low Volume Water
AK103	DRO/RRO Low Volume Water
AK101	Gasoline Range Organics (W)
SW8260D	Volatile Organic Compounds (W)

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Detectable Results Summary

Client Sample ID: **ANG-TWP-01**
Lab Sample ID: 1206053001

Parameter	Result	Units
Semivolatile Organic Fuels		
Diesel Range Organics	2.96	mg/L
Residual Range Organics	0.865	mg/L
Volatile Fuels		
Gasoline Range Organics	0.0472J	mg/L
Volatile GC/MS		
Benzene	0.713	ug/L
Ethylbenzene	0.477J	ug/L

Client Sample ID: **ANG-TWP-02**
Lab Sample ID: 1206053002

Parameter	Result	Units
Semivolatile Organic Fuels		
Diesel Range Organics	2.70	mg/L
Residual Range Organics	0.702	mg/L
Volatile Fuels		
Gasoline Range Organics	0.0462J	mg/L
Volatile GC/MS		
Benzene	0.687	ug/L
Ethylbenzene	0.481J	ug/L

Client Sample ID: **Trip Blank 1**
Lab Sample ID: 1206053003

Parameter	Result	Units
Volatile Fuels		
Gasoline Range Organics	0.0385J	mg/L

Client Sample ID: **OME-MW02-15**
Lab Sample ID: 1206053004

Parameter	Result	Units
Semivolatile Organic Fuels		
Diesel Range Organics	0.254J	mg/L
Residual Range Organics	0.388J	mg/L

Client Sample ID: **OME-MW03-15**
Lab Sample ID: 1206053005

Parameter	Result	Units
Semivolatile Organic Fuels		
Diesel Range Organics	0.300J	mg/L
Residual Range Organics	0.535	mg/L

Client Sample ID: **OME-MW01-15**
Lab Sample ID: 1206053006

Parameter	Result	Units
Semivolatile Organic Fuels		
Diesel Range Organics	0.578	mg/L
Residual Range Organics	1.00	mg/L
Volatile Fuels		
Gasoline Range Organics	0.0359J	mg/L
Volatile GC/MS		
Benzene	0.685	ug/L

Client Sample ID: **EB-MW01-15**
Lab Sample ID: 1206053007

Parameter	Result	Units
Polynuclear Aromatics GC/MS		
Naphthalene	0.0310J	ug/L
Semivolatile Organic Fuels		
Diesel Range Organics	0.352J	mg/L
Residual Range Organics	0.591	mg/L
Volatile Fuels		
Gasoline Range Organics	0.0459J	mg/L

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Results of **ANG-TWP-01**

Client Sample ID: **ANG-TWP-01**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053001
Lab Project ID: 1206053

Collection Date: 10/27/20 18:02
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	2.96		0.612	0.184	mg/L	1		11/11/20 18:25
Surrogates								
5a Androstane (surr)	102		50-150		%	1		11/11/20 18:25

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/11/20 18:25
Container ID: 1206053001-D

Prep Batch: XXX44197
Prep Method: SW3520C
Prep Date/Time: 11/05/20 16:12
Prep Initial Wt./Vol.: 245 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.865		0.510	0.153	mg/L	1		11/11/20 18:25
Surrogates								
n-Triacontane-d62 (surr)	111		50-150		%	1		11/11/20 18:25

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/11/20 18:25
Container ID: 1206053001-D

Prep Batch: XXX44197
Prep Method: SW3520C
Prep Date/Time: 11/05/20 16:12
Prep Initial Wt./Vol.: 245 mL
Prep Extract Vol: 1 mL

Print Date: 11/30/2020 11:35:38AM

J flagging is activated

Results of **ANG-TWP-01**

Client Sample ID: **ANG-TWP-01**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053001
Lab Project ID: 1206053

Collection Date: 10/27/20 18:02
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0472	J	0.100	0.0310	mg/L	1		11/04/20 01:39
Surrogates								
4-Bromofluorobenzene (surr)	112		50-150		%	1		11/04/20 01:39

Batch Information

Analytical Batch: VFC15435
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/04/20 01:39
Container ID: 1206053001-A

Prep Batch: VXX36648
Prep Method: SW5030B
Prep Date/Time: 11/03/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **ANG-TWP-01**

Client Sample ID: **ANG-TWP-01**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053001
Lab Project ID: 1206053

Collection Date: 10/27/20 18:02
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.713		0.400	0.120	ug/L	1		11/03/20 18:16
Ethylbenzene	0.477	J	1.00	0.310	ug/L	1		11/03/20 18:16
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/03/20 18:16
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/03/20 18:16
Toluene	0.500	U	1.00	0.310	ug/L	1		11/03/20 18:16
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/03/20 18:16
Surrogates								
1,2-Dichloroethane-D4 (surr)	117		81-118		%	1		11/03/20 18:16
4-Bromofluorobenzene (surr)	91.2		85-114		%	1		11/03/20 18:16
Toluene-d8 (surr)	97.8		89-112		%	1		11/03/20 18:16

Batch Information

Analytical Batch: VMS20467
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 11/03/20 18:16
Container ID: 1206053001-B

Prep Batch: VXX36644
Prep Method: SW5030B
Prep Date/Time: 11/03/20 12:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **ANG-TWP-02**

Client Sample ID: **ANG-TWP-02**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053002
Lab Project ID: 1206053

Collection Date: 10/27/20 18:12
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	2.70		0.714	0.214	mg/L	1		11/11/20 18:35
Surrogates								
5a Androstane (surr)	97.1		50-150		%	1		11/11/20 18:35

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/11/20 18:35
Container ID: 1206053002-D

Prep Batch: XXX44197
Prep Method: SW3520C
Prep Date/Time: 11/05/20 16:12
Prep Initial Wt./Vol.: 210 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.702		0.595	0.179	mg/L	1		11/11/20 18:35
Surrogates								
n-Triacontane-d62 (surr)	107		50-150		%	1		11/11/20 18:35

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/11/20 18:35
Container ID: 1206053002-D

Prep Batch: XXX44197
Prep Method: SW3520C
Prep Date/Time: 11/05/20 16:12
Prep Initial Wt./Vol.: 210 mL
Prep Extract Vol: 1 mL

Results of **ANG-TWP-02**

Client Sample ID: **ANG-TWP-02**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053002
Lab Project ID: 1206053

Collection Date: 10/27/20 18:12
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0462	J	0.100	0.0310	mg/L	1		11/04/20 00:46
Surrogates								
4-Bromofluorobenzene (surr)	116		50-150		%	1		11/04/20 00:46

Batch Information

Analytical Batch: VFC15435
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/04/20 00:46
Container ID: 1206053002-A

Prep Batch: VXX36648
Prep Method: SW5030B
Prep Date/Time: 11/03/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **ANG-TWP-02**

Client Sample ID: **ANG-TWP-02**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053002
Lab Project ID: 1206053

Collection Date: 10/27/20 18:12
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.687		0.400	0.120	ug/L	1		11/03/20 18:30
Ethylbenzene	0.481	J	1.00	0.310	ug/L	1		11/03/20 18:30
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/03/20 18:30
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/03/20 18:30
Toluene	0.500	U	1.00	0.310	ug/L	1		11/03/20 18:30
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/03/20 18:30
Surrogates								
1,2-Dichloroethane-D4 (surr)	113		81-118		%	1		11/03/20 18:30
4-Bromofluorobenzene (surr)	90.5		85-114		%	1		11/03/20 18:30
Toluene-d8 (surr)	99.1		89-112		%	1		11/03/20 18:30

Batch Information

Analytical Batch: VMS20467
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 11/03/20 18:30
Container ID: 1206053002-B

Prep Batch: VXX36644
Prep Method: SW5030B
Prep Date/Time: 11/03/20 12:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **Trip Blank 1**

Client Sample ID: **Trip Blank 1**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053003
Lab Project ID: 1206053

Collection Date: 10/27/20 18:02
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0385	J	0.100	0.0310	mg/L	1		11/03/20 20:40
Surrogates								
4-Bromofluorobenzene (surr)	74.2		50-150		%	1		11/03/20 20:40

Batch Information

Analytical Batch: VFC15435
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/03/20 20:40
Container ID: 1206053003-A

Prep Batch: VXX36648
Prep Method: SW5030B
Prep Date/Time: 11/03/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **Trip Blank 1**

Client Sample ID: **Trip Blank 1**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053003
Lab Project ID: 1206053

Collection Date: 10/27/20 18:02
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200	U	0.400	0.120	ug/L	1		11/03/20 14:39
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/03/20 14:39
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/03/20 14:39
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/03/20 14:39
Toluene	0.500	U	1.00	0.310	ug/L	1		11/03/20 14:39
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/03/20 14:39
Surrogates								
1,2-Dichloroethane-D4 (surr)	115		81-118		%	1		11/03/20 14:39
4-Bromofluorobenzene (surr)	91.9		85-114		%	1		11/03/20 14:39
Toluene-d8 (surr)	99.5		89-112		%	1		11/03/20 14:39

Batch Information

Analytical Batch: VMS20467
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 11/03/20 14:39
Container ID: 1206053003-B

Prep Batch: VXX36644
Prep Method: SW5030B
Prep Date/Time: 11/03/20 12:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **OME-MW02-15**

Client Sample ID: **OME-MW02-15**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053004
Lab Project ID: 1206053

Collection Date: 10/31/20 12:30
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:36
2-Methylnaphthalene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:36
Acenaphthene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:36
Acenaphthylene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:36
Anthracene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:36
Benzo(a)Anthracene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:36
Benzo[a]pyrene	0.00960	U	0.0192	0.00596	ug/L	1		11/25/20 03:36
Benzo[b]Fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:36
Benzo[g,h,i]perylene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:36
Benzo[k]fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:36
Chrysene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:36
Dibenzo[a,h]anthracene	0.00960	U	0.0192	0.00596	ug/L	1		11/25/20 03:36
Fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:36
Fluorene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:36
Indeno[1,2,3-c,d] pyrene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:36
Naphthalene	0.0481	U	0.0962	0.0298	ug/L	1		11/25/20 03:36
Phenanthrene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:36
Pyrene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:36
Surrogates								
2-Methylnaphthalene-d10 (surr)	57		37-78		%	1		11/25/20 03:36
Fluoranthene-d10 (surr)	67.9		24-116		%	1		11/25/20 03:36

Batch Information

Analytical Batch: XMS12418
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 11/25/20 03:36
Container ID: 1206053004-I

Prep Batch: XXX44183
Prep Method: SW3535A
Prep Date/Time: 11/04/20 12:27
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Print Date: 11/30/2020 11:35:38AM

J flagging is activated

Results of **OME-MW02-15**

Client Sample ID: **OME-MW02-15**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053004
Lab Project ID: 1206053

Collection Date: 10/31/20 12:30
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.254	J	0.577	0.173	mg/L	1		11/11/20 18:45
Surrogates								
5a Androstane (surr)	98.7		50-150		%	1		11/11/20 18:45

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/11/20 18:45
Container ID: 1206053004-G

Prep Batch: XXX44197
Prep Method: SW3520C
Prep Date/Time: 11/05/20 16:12
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.388	J	0.481	0.144	mg/L	1		11/11/20 18:45
Surrogates								
n-Triacontane-d62 (surr)	109		50-150		%	1		11/11/20 18:45

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/11/20 18:45
Container ID: 1206053004-G

Prep Batch: XXX44197
Prep Method: SW3520C
Prep Date/Time: 11/05/20 16:12
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Print Date: 11/30/2020 11:35:38AM

J flagging is activated

Results of **OME-MW02-15**

Client Sample ID: **OME-MW02-15**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053004
Lab Project ID: 1206053

Collection Date: 10/31/20 12:30
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		11/06/20 12:35
Surrogates								
4-Bromofluorobenzene (surr)	93.5		50-150		%	1		11/06/20 12:35

Batch Information

Analytical Batch: VFC15443
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/06/20 12:35
Container ID: 1206053004-B

Prep Batch: VXX36663
Prep Method: SW5030B
Prep Date/Time: 11/06/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **OME-MW02-15**

Client Sample ID: **OME-MW02-15**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053004
Lab Project ID: 1206053

Collection Date: 10/31/20 12:30
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200	U	0.400	0.120	ug/L	1		11/03/20 18:45
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/03/20 18:45
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/03/20 18:45
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/03/20 18:45
Toluene	0.500	U	1.00	0.310	ug/L	1		11/03/20 18:45
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/03/20 18:45
Surrogates								
1,2-Dichloroethane-D4 (surr)	113		81-118		%	1		11/03/20 18:45
4-Bromofluorobenzene (surr)	92		85-114		%	1		11/03/20 18:45
Toluene-d8 (surr)	99.6		89-112		%	1		11/03/20 18:45

Batch Information

Analytical Batch: VMS20467
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 11/03/20 18:45
Container ID: 1206053004-D

Prep Batch: VXX36644
Prep Method: SW5030B
Prep Date/Time: 11/03/20 12:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **OME-MW03-15**

Client Sample ID: **OME-MW03-15**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053005
Lab Project ID: 1206053

Collection Date: 10/31/20 12:40
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:57
2-Methylnaphthalene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:57
Acenaphthene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:57
Acenaphthylene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:57
Anthracene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:57
Benzo(a)Anthracene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:57
Benzo[a]pyrene	0.00960	U	0.0192	0.00596	ug/L	1		11/25/20 03:57
Benzo[b]Fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:57
Benzo[g,h,i]perylene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:57
Benzo[k]fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:57
Chrysene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:57
Dibenzo[a,h]anthracene	0.00960	U	0.0192	0.00596	ug/L	1		11/25/20 03:57
Fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:57
Fluorene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:57
Indeno[1,2,3-c,d] pyrene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:57
Naphthalene	0.0481	U	0.0962	0.0298	ug/L	1		11/25/20 03:57
Phenanthrene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:57
Pyrene	0.0240	U	0.0481	0.0144	ug/L	1		11/25/20 03:57
Surrogates								
2-Methylnaphthalene-d10 (surr)	62.9		37-78		%	1		11/25/20 03:57
Fluoranthene-d10 (surr)	71.5		24-116		%	1		11/25/20 03:57

Batch Information

Analytical Batch: XMS12418
Analytical Method: 8270D SIM LV (PAH)
Analyst: DSD
Analytical Date/Time: 11/25/20 03:57
Container ID: 1206053005-I

Prep Batch: XXX44183
Prep Method: SW3535A
Prep Date/Time: 11/04/20 12:27
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Print Date: 11/30/2020 11:35:38AM

J flagging is activated

Results of **OME-MW03-15**

Client Sample ID: **OME-MW03-15**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053005
Lab Project ID: 1206053

Collection Date: 10/31/20 12:40
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.300	J	0.577	0.173	mg/L	1		11/11/20 18:55
Surrogates								
5a Androstane (surr)	102		50-150		%	1		11/11/20 18:55

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/11/20 18:55
Container ID: 1206053005-G

Prep Batch: XXX44197
Prep Method: SW3520C
Prep Date/Time: 11/05/20 16:12
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.535		0.481	0.144	mg/L	1		11/11/20 18:55
Surrogates								
n-Triacontane-d62 (surr)	110		50-150		%	1		11/11/20 18:55

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/11/20 18:55
Container ID: 1206053005-G

Prep Batch: XXX44197
Prep Method: SW3520C
Prep Date/Time: 11/05/20 16:12
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Results of **OME-MW03-15**

Client Sample ID: **OME-MW03-15**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053005
Lab Project ID: 1206053

Collection Date: 10/31/20 12:40
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		11/06/20 12:52
Surrogates								
4-Bromofluorobenzene (surr)	89.7		50-150		%	1		11/06/20 12:52

Batch Information

Analytical Batch: VFC15443
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/06/20 12:52
Container ID: 1206053005-B

Prep Batch: VXX36663
Prep Method: SW5030B
Prep Date/Time: 11/06/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **OME-MW03-15**

Client Sample ID: **OME-MW03-15**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053005
Lab Project ID: 1206053

Collection Date: 10/31/20 12:40
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200	U	0.400	0.120	ug/L	1		11/03/20 18:59
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/03/20 18:59
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/03/20 18:59
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/03/20 18:59
Toluene	0.500	U	1.00	0.310	ug/L	1		11/03/20 18:59
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/03/20 18:59
Surrogates								
1,2-Dichloroethane-D4 (surr)	114		81-118		%	1		11/03/20 18:59
4-Bromofluorobenzene (surr)	91.8		85-114		%	1		11/03/20 18:59
Toluene-d8 (surr)	98.9		89-112		%	1		11/03/20 18:59

Batch Information

Analytical Batch: VMS20467
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 11/03/20 18:59
Container ID: 1206053005-D

Prep Batch: VXX36644
Prep Method: SW5030B
Prep Date/Time: 11/03/20 12:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **OME-MW01-15**

Client Sample ID: **OME-MW01-15**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053006
Lab Project ID: 1206053

Collection Date: 10/31/20 17:35
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.578		0.577	0.173	mg/L	1		11/11/20 19:05
Surrogates								
5a Androstane (surr)	96.6		50-150		%	1		11/11/20 19:05

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/11/20 19:05
Container ID: 1206053006-G

Prep Batch: XXX44197
Prep Method: SW3520C
Prep Date/Time: 11/05/20 16:12
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	1.00		0.481	0.144	mg/L	1		11/11/20 19:05
Surrogates								
n-Triacontane-d62 (surr)	107		50-150		%	1		11/11/20 19:05

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/11/20 19:05
Container ID: 1206053006-G

Prep Batch: XXX44197
Prep Method: SW3520C
Prep Date/Time: 11/05/20 16:12
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Results of **OME-MW01-15**

Client Sample ID: **OME-MW01-15**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053006
Lab Project ID: 1206053

Collection Date: 10/31/20 17:35
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0359	J	0.100	0.0310	mg/L	1		11/06/20 13:10
Surrogates								
4-Bromofluorobenzene (surr)	106		50-150		%	1		11/06/20 13:10

Batch Information

Analytical Batch: VFC15443
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/06/20 13:10
Container ID: 1206053006-B

Prep Batch: VXX36663
Prep Method: SW5030B
Prep Date/Time: 11/06/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **OME-MW01-15**

Client Sample ID: **OME-MW01-15**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053006
Lab Project ID: 1206053

Collection Date: 10/31/20 17:35
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.685		0.400	0.120	ug/L	1		11/03/20 19:13
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		11/03/20 19:13
o-Xylene	0.500 U		1.00	0.310	ug/L	1		11/03/20 19:13
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		11/03/20 19:13
Toluene	0.500 U		1.00	0.310	ug/L	1		11/03/20 19:13
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		11/03/20 19:13
Surrogates								
1,2-Dichloroethane-D4 (surr)	115		81-118		%	1		11/03/20 19:13
4-Bromofluorobenzene (surr)	91.6		85-114		%	1		11/03/20 19:13
Toluene-d8 (surr)	98.2		89-112		%	1		11/03/20 19:13

Batch Information

Analytical Batch: VMS20467
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 11/03/20 19:13
Container ID: 1206053006-D

Prep Batch: VXX36644
Prep Method: SW5030B
Prep Date/Time: 11/03/20 12:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **EB-MW01-15**

Client Sample ID: **EB-MW01-15**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053007
Lab Project ID: 1206053

Collection Date: 10/27/20 18:00
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0240	U	0.0481	0.0144	ug/L	1		11/20/20 09:12
2-Methylnaphthalene	0.0240	U	0.0481	0.0144	ug/L	1		11/20/20 09:12
Acenaphthene	0.0240	U	0.0481	0.0144	ug/L	1		11/20/20 09:12
Acenaphthylene	0.0240	U	0.0481	0.0144	ug/L	1		11/20/20 09:12
Anthracene	0.0240	U	0.0481	0.0144	ug/L	1		11/20/20 09:12
Benzo(a)Anthracene	0.0240	U	0.0481	0.0144	ug/L	1		11/20/20 09:12
Benzo[a]pyrene	0.00960	U	0.0192	0.00596	ug/L	1		11/20/20 09:12
Benzo[b]Fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		11/20/20 09:12
Benzo[g,h,i]perylene	0.0240	U	0.0481	0.0144	ug/L	1		11/20/20 09:12
Benzo[k]fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		11/20/20 09:12
Chrysene	0.0240	U	0.0481	0.0144	ug/L	1		11/20/20 09:12
Dibenzo[a,h]anthracene	0.00960	U	0.0192	0.00596	ug/L	1		11/20/20 09:12
Fluoranthene	0.0240	U	0.0481	0.0144	ug/L	1		11/20/20 09:12
Fluorene	0.0240	U	0.0481	0.0144	ug/L	1		11/20/20 09:12
Indeno[1,2,3-c,d] pyrene	0.0240	U	0.0481	0.0144	ug/L	1		11/20/20 09:12
Naphthalene	0.0310	J	0.0962	0.0298	ug/L	1		11/20/20 09:12
Phenanthrene	0.0240	U	0.0481	0.0144	ug/L	1		11/20/20 09:12
Pyrene	0.0240	U	0.0481	0.0144	ug/L	1		11/20/20 09:12
Surrogates								
2-Methylnaphthalene-d10 (surr)	69.8		37-78		%	1		11/20/20 09:12
Fluoranthene-d10 (surr)	73.2		24-116		%	1		11/20/20 09:12

Batch Information

Analytical Batch: XMS12412
Analytical Method: 8270D SIM LV (PAH)
Analyst: LAW
Analytical Date/Time: 11/20/20 09:12
Container ID: 1206053007-I

Prep Batch: XXX44176
Prep Method: SW3535A
Prep Date/Time: 11/03/20 11:04
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Print Date: 11/30/2020 11:35:38AM

J flagging is activated

Results of **EB-MW01-15**

Client Sample ID: **EB-MW01-15**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053007
Lab Project ID: 1206053

Collection Date: 10/27/20 18:00
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.352	J	0.545	0.164	mg/L	1		11/11/20 19:16
Surrogates								
5a Androstane (surr)	102		50-150		%	1		11/11/20 19:16

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/11/20 19:16
Container ID: 1206053007-G

Prep Batch: XXX44197
Prep Method: SW3520C
Prep Date/Time: 11/05/20 16:12
Prep Initial Wt./Vol.: 275 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.591		0.455	0.136	mg/L	1		11/11/20 19:16
Surrogates								
n-Triacontane-d62 (surr)	111		50-150		%	1		11/11/20 19:16

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/11/20 19:16
Container ID: 1206053007-G

Prep Batch: XXX44197
Prep Method: SW3520C
Prep Date/Time: 11/05/20 16:12
Prep Initial Wt./Vol.: 275 mL
Prep Extract Vol: 1 mL

Results of **EB-MW01-15**

Client Sample ID: **EB-MW01-15**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053007
Lab Project ID: 1206053

Collection Date: 10/27/20 18:00
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0459	J	0.100	0.0310	mg/L	1		11/04/20 01:04
Surrogates								
4-Bromofluorobenzene (surr)	61.9		50-150		%	1		11/04/20 01:04

Batch Information

Analytical Batch: VFC15435
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/04/20 01:04
Container ID: 1206053007-A

Prep Batch: VXX36648
Prep Method: SW5030B
Prep Date/Time: 11/03/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **EB-MW01-15**

Client Sample ID: **EB-MW01-15**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053007
Lab Project ID: 1206053

Collection Date: 10/27/20 18:00
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200	U	0.400	0.120	ug/L	1		11/03/20 19:28
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/03/20 19:28
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/03/20 19:28
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/03/20 19:28
Toluene	0.500	U	1.00	0.310	ug/L	1		11/03/20 19:28
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/03/20 19:28
Surrogates								
1,2-Dichloroethane-D4 (surr)	115		81-118		%	1		11/03/20 19:28
4-Bromofluorobenzene (surr)	90.7		85-114		%	1		11/03/20 19:28
Toluene-d8 (surr)	97.9		89-112		%	1		11/03/20 19:28

Batch Information

Analytical Batch: VMS20467
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 11/03/20 19:28
Container ID: 1206053007-D

Prep Batch: VXX36644
Prep Method: SW5030B
Prep Date/Time: 11/03/20 12:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **Trip Blank 2**

Client Sample ID: **Trip Blank 2**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053008
Lab Project ID: 1206053

Collection Date: 10/31/20 18:00
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		11/06/20 12:17
Surrogates								
4-Bromofluorobenzene (surr)	95.9		50-150		%	1		11/06/20 12:17

Batch Information

Analytical Batch: VFC15443
Analytical Method: AK101
Analyst: ALJ
Analytical Date/Time: 11/06/20 12:17
Container ID: 1206053008-B

Prep Batch: VXX36663
Prep Method: SW5030B
Prep Date/Time: 11/06/20 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **Trip Blank 2**

Client Sample ID: **Trip Blank 2**
Client Project ID: **105745 DOT&PF Nome**
Lab Sample ID: 1206053008
Lab Project ID: 1206053

Collection Date: 10/31/20 18:00
Received Date: 11/02/20 16:04
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200	U	0.400	0.120	ug/L	1		11/03/20 14:24
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		11/03/20 14:24
o-Xylene	0.500	U	1.00	0.310	ug/L	1		11/03/20 14:24
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		11/03/20 14:24
Toluene	0.500	U	1.00	0.310	ug/L	1		11/03/20 14:24
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		11/03/20 14:24
Surrogates								
1,2-Dichloroethane-D4 (surr)	116		81-118		%	1		11/03/20 14:24
4-Bromofluorobenzene (surr)	90.8		85-114		%	1		11/03/20 14:24
Toluene-d8 (surr)	100		89-112		%	1		11/03/20 14:24

Batch Information

Analytical Batch: VMS20467
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 11/03/20 14:24
Container ID: 1206053008-A

Prep Batch: VXX36644
Prep Method: SW5030B
Prep Date/Time: 11/03/20 12:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1813875 [VXX/36644]
Blank Lab ID: 1591429

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1206053001, 1206053002, 1206053003, 1206053004, 1206053005, 1206053006, 1206053007, 1206053008

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.200U	0.400	0.120	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	111	81-118		%
4-Bromofluorobenzene (surr)	91	85-114		%
Toluene-d8 (surr)	98.9	89-112		%

Batch Information

Analytical Batch: VMS20467
Analytical Method: SW8260D
Instrument: Agilent 7890-75MS
Analyst: NRB
Analytical Date/Time: 11/3/2020 12:00:00PM

Prep Batch: VXX36644
Prep Method: SW5030B
Prep Date/Time: 11/3/2020 12:00:00PM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1206053 [VXX36644]
Blank Spike Lab ID: 1591430
Date Analyzed: 11/03/2020 12:29

Spike Duplicate ID: LCSD for HBN 1206053 [VXX36644]
Spike Duplicate Lab ID: 1591431
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1206053001, 1206053002, 1206053003, 1206053004, 1206053005, 1206053006, 1206053007, 1206053008

Results by **SW8260D**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	30	30.5	102	30	30.1	100	(79-120)	1.10	(< 20)
Ethylbenzene	30	30.3	101	30	30.9	103	(79-121)	2.10	(< 20)
o-Xylene	30	29.9	100	30	30.4	101	(78-122)	1.60	(< 20)
P & M -Xylene	60	60.3	100	60	61.4	102	(80-121)	1.80	(< 20)
Toluene	30	28.8	96	30	29.6	99	(80-121)	2.60	(< 20)
Xylenes (total)	90	90.2	100	90	91.8	102	(79-121)	1.80	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	106	106	30	104	104	(81-118)	1.80	
4-Bromofluorobenzene (surr)	30	91.2	91	30	91.7	92	(85-114)	0.57	
Toluene-d8 (surr)	30	98.5	99	30	100	100	(89-112)	1.80	

Batch Information

Analytical Batch: **VMS20467**
Analytical Method: **SW8260D**
Instrument: **Agilent 7890-75MS**
Analyst: **NRB**

Prep Batch: **VXX36644**
Prep Method: **SW5030B**
Prep Date/Time: **11/03/2020 12:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1813905 [VXX/36648]
Blank Lab ID: 1591546

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1206053001, 1206053002, 1206053003, 1206053007

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	99.8	50-150		%

Batch Information

Analytical Batch: VFC15435
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ALJ
Analytical Date/Time: 11/3/2020 1:35:00PM

Prep Batch: VXX36648
Prep Method: SW5030B
Prep Date/Time: 11/3/2020 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1206053 [VXX36648]
Blank Spike Lab ID: 1591549
Date Analyzed: 11/03/2020 20:23

Spike Duplicate ID: LCSD for HBN 1206053 [VXX36648]
Spike Duplicate Lab ID: 1591550
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1206053001, 1206053002, 1206053003, 1206053007

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	0.856	86	1.00	0.758	76	(60-120)	12.20	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	94.7	95	0.0500	81.2	81	(50-150)	15.30	

Batch Information

Analytical Batch: **VFC15435**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36648**
Prep Method: **SW5030B**
Prep Date/Time: **11/03/2020 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1814064 [VXX/36663]
Blank Lab ID: 1592327

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1206053004, 1206053005, 1206053006, 1206053008

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	98.1	50-150		%

Batch Information

Analytical Batch: VFC15443
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ALJ
Analytical Date/Time: 11/6/2020 10:29:00AM

Prep Batch: VXX36663
Prep Method: SW5030B
Prep Date/Time: 11/6/2020 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1206053 [VXX36663]
Blank Spike Lab ID: 1592328
Date Analyzed: 11/06/2020 11:22

Spike Duplicate ID: LCSD for HBN 1206053 [VXX36663]
Spike Duplicate Lab ID: 1592329
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1206053004, 1206053005, 1206053006, 1206053008

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.01	101	1.00	1.01	101	(60-120)	0.32	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	107	107	0.0500	108	108	(50-150)	0.28	

Batch Information

Analytical Batch: **VFC15443**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ALJ**

Prep Batch: **VXX36663**
Prep Method: **SW5030B**
Prep Date/Time: **11/06/2020 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1813833 [XXX/44176]
Blank Lab ID: 1591229

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1206053007

Results by **8270D SIM LV (PAH)**

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
2-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0100U	0.0200	0.00620	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0100U	0.0200	0.00620	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0250U	0.0500	0.0150	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	78.2*	37-78		%
Fluoranthene-d10 (surr)	86.5	24-116		%

Batch Information

Analytical Batch: XMS12412
Analytical Method: 8270D SIM LV (PAH)
Instrument: Agilent GC 7890B/5977A SWA
Analyst: LAW
Analytical Date/Time: 11/20/2020 1:43:00AM

Prep Batch: XXX44176
Prep Method: SW3535A
Prep Date/Time: 11/3/2020 11:04:32AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 11/30/2020 11:35:55AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1206053 [XXX44176]
Blank Spike Lab ID: 1591230
Date Analyzed: 11/20/2020 02:03

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1206053007

Results by **8270D SIM LV (PAH)**

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	2	1.52	76	(41-115)
2-Methylnaphthalene	2	1.54	77	(39-114)
Acenaphthene	2	1.61	81	(48-114)
Acenaphthylene	2	1.62	81	(35-121)
Anthracene	2	1.62	81	(53-119)
Benzo(a)Anthracene	2	1.42	71	(59-120)
Benzo[a]pyrene	2	1.56	78	(53-120)
Benzo[b]Fluoranthene	2	1.63	82	(53-126)
Benzo[g,h,i]perylene	2	1.63	82	(44-128)
Benzo[k]fluoranthene	2	1.67	84	(54-125)
Chrysene	2	1.60	80	(57-120)
Dibenzo[a,h]anthracene	2	1.64	82	(44-131)
Fluoranthene	2	1.64	82	(58-120)
Fluorene	2	1.67	84	(50-118)
Indeno[1,2,3-c,d] pyrene	2	1.74	87	(48-130)
Naphthalene	2	1.53	77	(43-114)
Phenanthrene	2	1.74	87	(53-115)
Pyrene	2	1.60	80	(53-121)
Surrogates				
2-Methylnaphthalene-d10 (surr)	2	72.9	73	(37-78)
Fluoranthene-d10 (surr)	2	79.4	79	(24-116)

Batch Information

Analytical Batch: **XMS12412**
Analytical Method: **8270D SIM LV (PAH)**
Instrument: **Agilent GC 7890B/5977A SWA**
Analyst: **LAW**

Prep Batch: **XXX44176**
Prep Method: **SW3535A**
Prep Date/Time: **11/03/2020 11:04**
Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1206014002
MS Sample ID: 1591231 MS
MSD Sample ID: 1591232 MSD

QC for Samples: 1206053007

Analysis Date: 11/20/2020 2:24
Analysis Date: 11/20/2020 2:44
Analysis Date: 11/20/2020 3:05
Matrix: Water (Surface, Eff., Ground)

Results by **8270D SIM LV (PAH)**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	0.0232U	1.89	1.46	78	1.89	1.48	79	41-115	1.50	(< 20)
2-Methylnaphthalene	0.0232U	1.89	1.49	79	1.89	1.50	79	39-114	0.51	(< 20)
Acenaphthene	0.0232U	1.89	1.56	83	1.89	1.57	83	48-114	0.54	(< 20)
Acenaphthylene	0.0232U	1.89	1.55	82	1.89	1.57	83	35-121	1.10	(< 20)
Anthracene	0.0232U	1.89	1.57	83	1.89	1.55	82	53-119	1.30	(< 20)
Benzo(a)Anthracene	0.0232U	1.89	1.42	75	1.89	1.36	72	59-120	4.30	(< 20)
Benzo[a]pyrene	0.00925U	1.89	1.55	82	1.89	1.52	80	53-120	2.00	(< 20)
Benzo[b]Fluoranthene	0.0232U	1.89	1.6	85	1.89	1.59	84	53-126	1.20	(< 20)
Benzo[g,h,i]perylene	0.0232U	1.89	1.59	84	1.89	1.58	84	44-128	0.70	(< 20)
Benzo[k]fluoranthene	0.0232U	1.89	1.65	88	1.89	1.61	86	54-125	2.20	(< 20)
Chrysene	0.0232U	1.89	1.58	84	1.89	1.53	81	57-120	2.90	(< 20)
Dibenzo[a,h]anthracene	0.00925U	1.89	1.59	84	1.89	1.58	84	44-131	0.76	(< 20)
Fluoranthene	0.0232U	1.89	1.6	85	1.89	1.56	83	58-120	2.30	(< 20)
Fluorene	0.0232U	1.89	1.57	83	1.89	1.62	86	50-118	2.80	(< 20)
Indeno[1,2,3-c,d] pyrene	0.0232U	1.89	1.69	89	1.89	1.67	89	48-130	0.80	(< 20)
Naphthalene	0.0463U	1.89	1.52	80	1.89	1.52	81	43-114	0.30	(< 20)
Phenanthrene	0.0232U	1.89	1.66	88	1.89	1.65	88	53-115	0.18	(< 20)
Pyrene	0.0232U	1.89	1.56	83	1.89	1.53	81	53-121	1.90	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		1.89	1.41	75	1.89	1.43	76	37-78	1.60	
Fluoranthene-d10 (surr)		1.89	1.54	81	1.89	1.52	81	24-116	1.00	

Batch Information

Analytical Batch: XMS12412
Analytical Method: 8270D SIM LV (PAH)
Instrument: Agilent GC 7890B/5977A SWA
Analyst: LAW
Analytical Date/Time: 11/20/2020 2:44:00AM

Prep Batch: XXX44176
Prep Method: 3535 Solid Phase Ext for 8270 PAH SIM LV
Prep Date/Time: 11/3/2020 11:04:32AM
Prep Initial Wt./Vol.: 265.00mL
Prep Extract Vol: 1.00mL

Print Date: 11/30/2020 11:35:58AM

Method Blank

Blank ID: MB for HBN 1813885 [XXX/44183]
Blank Lab ID: 1591463

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1206053004, 1206053005

Results by **8270D SIM LV (PAH)**

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
2-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0100U	0.0200	0.00620	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0100U	0.0200	0.00620	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0250U	0.0500	0.0150	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	58.2	37-78		%
Fluoranthene-d10 (surr)	69.9	24-116		%

Batch Information

Analytical Batch: XMS12418
Analytical Method: 8270D SIM LV (PAH)
Instrument: Agilent GC 7890B/5977A SWA
Analyst: DSD
Analytical Date/Time: 11/24/2020 11:31:00PM

Prep Batch: XXX44183
Prep Method: SW3535A
Prep Date/Time: 11/4/2020 12:27:23PM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1206053 [XXX44183]
Blank Spike Lab ID: 1591464
Date Analyzed: 11/24/2020 23:51

Spike Duplicate ID: LCSD for HBN 1206053 [XXX44183]
Spike Duplicate Lab ID: 1591465
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1206053004, 1206053005

Results by **8270D SIM LV (PAH)**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	2	1.36	68	2	1.28	64	(41-115)	6.00	(< 20)
2-Methylnaphthalene	2	1.37	69	2	1.28	64	(39-114)	7.00	(< 20)
Acenaphthene	2	1.46	73	2	1.43	71	(48-114)	2.60	(< 20)
Acenaphthylene	2	1.49	74	2	1.44	72	(35-121)	3.50	(< 20)
Anthracene	2	1.50	75	2	1.42	71	(53-119)	5.30	(< 20)
Benzo(a)Anthracene	2	1.45	73	2	1.37	68	(59-120)	6.00	(< 20)
Benzo[a]pyrene	2	1.55	77	2	1.48	74	(53-120)	4.10	(< 20)
Benzo[b]Fluoranthene	2	1.59	80	2	1.51	76	(53-126)	5.10	(< 20)
Benzo[g,h,i]perylene	2	1.61	81	2	1.53	76	(44-128)	5.30	(< 20)
Benzo[k]fluoranthene	2	1.67	84	2	1.58	79	(54-125)	5.30	(< 20)
Chrysene	2	1.59	80	2	1.47	74	(57-120)	7.60	(< 20)
Dibenzo[a,h]anthracene	2	1.62	81	2	1.53	77	(44-131)	5.60	(< 20)
Fluoranthene	2	1.55	78	2	1.47	74	(58-120)	5.30	(< 20)
Fluorene	2	1.53	76	2	1.45	73	(50-118)	5.20	(< 20)
Indeno[1,2,3-c,d] pyrene	2	1.71	86	2	1.62	81	(48-130)	5.70	(< 20)
Naphthalene	2	1.40	70	2	1.30	65	(43-114)	7.80	(< 20)
Phenanthrene	2	1.63	82	2	1.55	78	(53-115)	5.00	(< 20)
Pyrene	2	1.56	78	2	1.45	72	(53-121)	7.20	(< 20)
Surrogates									
2-Methylnaphthalene-d10 (surr)	2	64.5	65	2	61.9	62	(37-78)	4.10	
Fluoranthene-d10 (surr)	2	73.5	74	2	70	70	(24-116)	4.90	

Batch Information

Analytical Batch: **XMS12418**
Analytical Method: **8270D SIM LV (PAH)**
Instrument: **Agilent GC 7890B/5977A SWA**
Analyst: **DSD**

Prep Batch: **XXX44183**
Prep Method: **SW3535A**
Prep Date/Time: **11/04/2020 12:27**
Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL

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Matrix Spike Summary

Original Sample ID: 1206018004
MS Sample ID: 1591958 MS
MSD Sample ID: 1591959 MSD

Analysis Date: 11/25/2020 1:54
Analysis Date: 11/25/2020 2:14
Analysis Date: 11/25/2020 2:35
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1206053004, 1206053005

Results by **8270D SIM LV (PAH)**

		Matrix Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Acenaphthene	0.0240U	2.23	1.5	67	2.03	1.48	73	48-114	1.50	(< 20)
Acenaphthylene	0.0240U	2.23	1.57	70	2.03	1.51	74	35-121	4.10	(< 20)
Anthracene	0.0240U	2.23	1.55	69	2.03	1.51	74	53-119	2.60	(< 20)
Benzo(a)Anthracene	0.0240U	2.23	1.52	68	2.03	1.46	72	59-120	3.80	(< 20)
Benzo[a]pyrene	0.00960U	2.23	1.64	74	2.03	1.61	79	53-120	1.80	(< 20)
Benzo[b]Fluoranthene	0.0240U	2.23	1.65	74	2.03	1.60	79	53-126	3.00	(< 20)
Benzo[g,h,i]perylene	0.0240U	2.23	1.67	75	2.03	1.60	79	44-128	4.50	(< 20)
Benzo[k]fluoranthene	0.0240U	2.23	1.77	79	2.03	1.69	83	54-125	4.30	(< 20)
Chrysene	0.0240U	2.23	1.67	75	2.03	1.58	78	57-120	5.70	(< 20)
Dibenzo[a,h]anthracene	0.00960U	2.23	1.68	75	2.03	1.61	79	44-131	4.60	(< 20)
Fluoranthene	0.0240U	2.23	1.62	73	2.03	1.55	76	58-120	4.50	(< 20)
Fluorene	0.0240U	2.23	1.58	71	2.03	1.54	76	50-118	3.00	(< 20)
Indeno[1,2,3-c,d] pyrene	0.0240U	2.23	1.78	80	2.03	1.71	84	48-130	3.90	(< 20)
Naphthalene	0.0481U	2.23	1.45	65	2.03	1.42	70	43-114	2.20	(< 20)
Phenanthrene	0.0240U	2.23	1.69	76	2.03	1.65	81	53-115	2.60	(< 20)
Pyrene	0.0240U	2.23	1.59	71	2.03	1.55	76	53-121	2.80	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		2.23	1.32	59	2.03	1.28	63	37-78	3.00	
Fluoranthene-d10 (surr)		2.23	1.55	69	2.03	1.50	74	24-116	3.40	

Batch Information

Analytical Batch: XMS12418
Analytical Method: 8270D SIM LV (PAH)
Instrument: Agilent GC 7890B/5977A SWA
Analyst: DSD
Analytical Date/Time: 11/25/2020 2:14:00AM

Prep Batch: XXX44183
Prep Method: 3535 Solid Phase Ext for 8270 PAH SIM LV
Prep Date/Time: 11/4/2020 12:27:23PM
Prep Initial Wt./Vol.: 224.00mL
Prep Extract Vol: 1.00mL

Print Date: 11/30/2020 11:36:03AM

Method Blank

Blank ID: MB for HBN 1813971 [XXX/44197]
Blank Lab ID: 1591891

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1206053001, 1206053002, 1206053004, 1206053005, 1206053006, 1206053007

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	112	60-120		%

Batch Information

Analytical Batch: XFC15809
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: CDM
Analytical Date/Time: 11/11/2020 1:44:00PM

Prep Batch: XXX44197
Prep Method: SW3520C
Prep Date/Time: 11/5/2020 4:12:14PM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1206053 [VVVXX148]
Blank Spike Lab ID: 1541942
Date Analyzed: 11/11/2020 13:5X

Spike Duplicate ID: LCSD for HBN 1206053 [VVVXX148]
Spike Duplicate Lab ID: 1541943
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1206053001, 1206053002, 120605300X, 1206053005, 1206053006, 1206053008

Results by **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range 7 rganics	20	16.8	9X	20	16.X	92	(85Ø125)	2.20	(- 20)
Surrogates									
5a Androstane (surr)	0.X	115	115	0.X	113	113	(60Ø120)	2.10	

Batch Information

Analytical Batc<: **XFC15809**
Analytical Met<od: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **CDM**

Prep Batc<: **XXX44197**
Prep Met<od: **SW3520C**
Prep Date/hime: **11/05/2020 16:12**
Spike Init Wt./Tol.: 20 mg/L Extract Tol: 1 mL
Dupe Init Wt./Tol.: 20 mg/L Extract Tol: 1 mL

SGS Nort< America Inc.
200 West Potter Drive Anc<orage, AK 45519
t 408.562.23X3 **f** 408.561.5301 www.us.sgs.com

Method Blank

Blank ID: MB for HBN 1813971 [XXX/44197]
Blank Lab ID: 1591891

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1206053001, 1206053002, 1206053004, 1206053005, 1206053006, 1206053007

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	0.250U	0.500	0.150	mg/L
Surrogates				
nA riacontaneAd62 (surr)	109	60A120		%

Batch Information

hnalytical BatcF: XKC15809
hnalytical MetFod: hT103
Instrument: hgilent 7890B K
hnalyst: CDM
hnalytical Date/- ime: 11/11/2020 1:44:00PM

Prep BatcF: XXX44197
Prep MetFod: SW3520C
Prep Date/- ime: 11/5/2020 4:12:14PM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 11/30/2020 11:36:09hM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1206053 [VVVXX148]
Blank Spike Lab ID: 1541942
Date Analyzed: 11/11/2020 13:5X

Spike Duplicate ID: LCSD for HBN 1206053 [VVVXX148]
Spike Duplicate Lab ID: 1541943
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1206053001, 1206053002, 120605300X, 1206053005, 1206053006, 1206053008

Results by **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Residual Range 7 rganics	20	14.5	48	20	19.4	4X	(60C120)	3.10	(- 20)
Surrogates									
nCriacontaneC162 (surr)	0.X	102	102	0.X	103	103	(60C120)	1.20	

Batch Information

Analytical Batch: **XFC15809**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **CDM**

Prep Batch: **XXX44197**
Prep Method: **SW2530C**
Prep Date/<ime: **11/05/3030 16:13**
Spike Init Wt./Tol.: 20 mg/L Extract Tol: 1 mL
Dupe Init Wt./Tol.: 20 mg/L Extract Tol: 1 mL

Print Date: 11/30/2020 11:36:11AM

1206053

P# 350732 XO

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600
www.shannonwilson.com

STODY RECORD

Page 1 of 1

Laboratory SGS North America
Attn: Jen Dawkins

Analytical Methods (include preservative if used)

Turn Around Time:	Quote No:	J-Flags:
[X] Normal [ ] Rush	—	[X] Yes [ ] No
Please Specify		

Sample Identity	Lab No.	Time	Date Sampled	GRO (AK 101)	BTEX (8260 D)	DRO/RRO (AK 102/103)	PAHs (8270 D-SIM)				Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
ANG-TWP-01	1AD	18:02	10/27/20	X	X	X					4	Groundwater (low volume)
ANG-TWP-02	2AD	18:12	↓	X	X	X					4	↓ (low volume)
Trip blank 1	3AC	—	↓	X	X						3	Trip blank
OME-MW02-15	4AJ	12:30	10/31/20	X	X	X	X				10	Groundwater
OME-MW03-15	5AJ	12:40		X	X	X	X				10	
OME-MW01-15	6AH	17:35		X	X	X					8	
OME-MW01-30		16:40		X	X	X					8	
EB-MW01-15	7AJ	18:00		X	X	X	X				10	Equipment blk
Trip blank 2	8AC	—	↓	X	X						3	Trip blk

Project Information	
Number:	105745
Name:	DOT&PF Nome
Contact:	MDN
Ongoing Project?	Yes [X] No [ ]
Sampler:	VTY/APW/MDN

Sample Receipt	
Total No. of Containers:	60
COC Seals/Intact? Y/N/NA	
Received Good Cond./Cold	
Temp:	
Delivery Method:	Goldstreak

Reliquished By: 1.	Reliquished By: 2.	Reliquished By: 3.
Signature: Marcy Nadel Time: 1530	Signature: Time:	Signature: Time:
Printed Name: Marcy Nadel Date: 11/1/20	Printed Name: Date:	Printed Name: Date:
Company: Shannon & Wilson	Company:	Company:

Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time:	Signature: Time:	Signature: Ryan Conlon RJC Time: 16:09
Printed Name: Date:	Printed Name: Date:	Printed Name: Ryan Conlon Date: 11/2/20
Company:	Company:	Company: SGS Alert

Notes:

Please bill to 105745-002

1.) DS2 IF, IR

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - job file

* Trip blanks stored with samples collected 10/27 (Trip blank #1) and 10/31 (Trip blank #2) in separate coolers until shipment.

No. 36146

Alert Expeditors Inc. **#407199**

Citywide Delivery • 440-3351
8421 Flamingo Drive • Anchorage, Alaska 99502

Date 11/2/2020

From Marcy Nalel

To Dan McMahon (SGS)

Collect ☐	Prepay ☐	Advance Charges ☐
Job # DME	PO# AS 8130 7085	

2 of 4

Water Samples

Shipped Signature

Total Charge

Received By:

e-Sample Receipt Form

SGS Workorder #: 1206053

1 2 0 6 0 5 3

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		N/A — Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	Yes	1F ,1R
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
N/A — **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 1.3 °C Therm. ID: D52
		Cooler ID: @ °C Therm. ID:
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	No	Sample 3G, 3H, 4G, and 4H were receive with ice.
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	Yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	No	Sample OME-MW01-30 was not received in cooler with samples.
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
	N/A	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	No	Samples 1 and 2 were received with only one container for DRO/RRO. Proceed with limited Volume.
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	Yes	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition
1206053001-A	HCL to pH < 2	OK
1206053001-B	HCL to pH < 2	OK
1206053001-C	HCL to pH < 2	OK
1206053001-D	HCL to pH < 2	OK
1206053002-A	HCL to pH < 2	OK
1206053002-B	HCL to pH < 2	OK
1206053002-C	HCL to pH < 2	OK
1206053002-D	HCL to pH < 2	OK
1206053003-A	HCL to pH < 2	OK
1206053003-B	HCL to pH < 2	OK
1206053003-C	HCL to pH < 2	OK
1206053004-A	HCL to pH < 2	OK
1206053004-B	HCL to pH < 2	OK
1206053004-C	HCL to pH < 2	OK
1206053004-D	HCL to pH < 2	OK
1206053004-E	HCL to pH < 2	OK
1206053004-F	HCL to pH < 2	OK
1206053004-G	HCL to pH < 2	FR
1206053004-H	HCL to pH < 2	FR
1206053004-I	No Preservative Required	OK
1206053004-J	No Preservative Required	OK
1206053005-A	HCL to pH < 2	OK
1206053005-B	HCL to pH < 2	OK
1206053005-C	HCL to pH < 2	OK
1206053005-D	HCL to pH < 2	OK
1206053005-E	HCL to pH < 2	OK
1206053005-F	HCL to pH < 2	OK
1206053005-G	HCL to pH < 2	FR
1206053005-H	HCL to pH < 2	FR
1206053005-I	No Preservative Required	OK
1206053005-J	No Preservative Required	OK
1206053006-A	HCL to pH < 2	OK
1206053006-B	HCL to pH < 2	OK
1206053006-C	HCL to pH < 2	OK
1206053006-D	HCL to pH < 2	OK
1206053006-E	HCL to pH < 2	OK
1206053006-F	HCL to pH < 2	OK
1206053006-G	HCL to pH < 2	OK
1206053006-H	HCL to pH < 2	OK
1206053007-A	HCL to pH < 2	OK
1206053007-B	HCL to pH < 2	OK
1206053007-C	HCL to pH < 2	OK
1206053007-D	HCL to pH < 2	OK
1206053007-E	HCL to pH < 2	OK
1206053007-F	HCL to pH < 2	OK
1206053007-G	HCL to pH < 2	OK
1206053007-H	HCL to pH < 2	OK
1206053007-I	No Preservative Required	OK
1206053007-J	No Preservative Required	OK
1206053008-A	HCL to pH < 2	OK
1206053008-B	HCL to pH < 2	OK
1206053008-C	HCL to pH < 2	OK

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
QN - Insufficient sample quantity provided.

Laboratory Data Review Checklist

Completed By:

Veselina Yakimova

Title:

Geologist

Date:

December 21, 2020

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

SGS North America, Inc.

Laboratory Report Number:

1206053

Laboratory Report Date:

November 30, 2020

CS Site Name:

Nome Airport Statewide PFAS

ADEC File Number:

400.38.056

Hazard Identification Number:

27154

1206053

Laboratory Report Date:

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

   Yes☒ No☐ N/A☐ Comments:

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

   Yes☐ No☐ N/A☒ Comments:

   Samples were analyzed by the SGS North America, Inc. laboratory in Anchorage, AK

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:

3. Laboratory Sample Receipt Documentation

   a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

   Yes☒ No☐ N/A☐ Comments:

   Sample cooler was received at 1.3° C. However, the sample receipt form notes that sample *OME-MW02-15* was received with ice in the DRO/RRO bottles. The form also noted samples "3G, 3H, and 4H" were received with ice; however, these bottles were not used for analysis and the results are unaffected.

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

   Yes☒ No☐ N/A☐ Comments:

   c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

   Yes☒ No☐ N/A☐ Comments:

   The sample receipt form notes that the samples arrived in good condition, with the exceptions noted above.

1206053

Laboratory Report Date:

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:

Sample *OME-MW01-30* was not received in cooler with samples as it was added to COC in error. Samples *ANG-TWP-01* and *ANG-TWP-02* were received with only one container for DRO/RRO. Analysis proceeded with limited volume.

e. Data quality or usability affected?

Comments:

The DRO and RRO results for sample *OME-MW02-15* are considered affected by the presence of ice. This sample has been flagged due to the presence of contamination in the equipment blank. No further flagging has been applied for the presence of ice. See below for additional details.

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:

No discrepancies, errors or QC failures were identified by the laboratory.

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

No corrective actions were documented in the case narrative.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

The case narrative does not specify an effect on data quality/usability.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes☒ No☐ N/A☐ Comments:

1206053

Laboratory Report Date:

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:

Soil samples were not submitted with this work order.

d. Are the reported LOQs 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 and/or usability was not affected; see above.

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 limit of quantitation (LOQ) or project specified objectives?

Yes☒ No☐ N/A☐ Comments:

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

Project analytes were not detected in the method blank samples associated with this work order.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes☐ No☐ N/A☒ Comments:

The method blanks did not contain detectable concentrations of any of the project analytes.

v. Data quality or usability affected?

Comments:

The data quality/usability is not affected; see above.

Laboratory Report Date:

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes☒ No☐ N/A☐ Comments:

LCS and MS/MSD samples were reported for PAH analysis for preparatory batch XXX44176. LCS/LCSD samples were reported for the other analytes/batches in this work order.

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

Metals and/or inorganics were not analyzed as part of this work order.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

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. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes☒ No☐ N/A☐ Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

None; analytical 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 of the data was not required; see above.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and/or usability was not affected; see above.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

MS/MSD samples were reported for PAH analysis for preparatory batch XXX44176.

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☐ No☐ N/A☒ Comments:

Metals and/or inorganics were not analyzed as part of 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 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:

%R and RPD are 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:

See above.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

The data quality and/or usability was not 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:

PAH surrogate was reported slightly above the recovery limits for the method blank sample associated with preparatory batch XXX44176. The associated results were not detected and therefore unaffected.

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:

There were no surrogate recovery failures associated with this work order.

iv. Data quality or usability affected?

Comments:

The data quality and/or usability was 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:

Trip Blank 1 was stored and transported with samples *ANG-TWP-01* and *ANG-TWP-02*, Trip Blank 2 was stored and transported with samples *OME-MW01-15, EB-MW01-15, OME-MW02-15* and *OME-MW03-15*.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes☒ No☐ N/A☐ Comments:

iii. All results less than LOQ and project specified objectives?

Yes☒ No☐ N/A☐ Comments:

However, GRO was detected at an estimated concentration below the LOQ in Trip Blank 1.

iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

Trip Blank 1 is associated with samples *ANG-TWP-01* and *ANG-TWP-02*.

v. Data quality or usability affected?

Comments:

The project samples contained GRO concentrations less than the LOQ and less than five times that of the concentration detected in the MB. The GRO results for these samples are flagged “UB” at the corresponding LOQ.

Laboratory Report Date:

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes☒ No☐ N/A☐ Comments:

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

The field duplicate pairs *ANG-TWP-01 / ANG-TWP-02,* and *OME-MW02-15 / OME-MW03-15* were submitted with this work order.

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 for RRO in *OME-MW02-15* and *OME-MW03-15* is 31.85%. RRO results in the corresponding samples have been qualified due to an EB detection. No further flagging has been applied.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)
Comments:

The data quality and/or usability was affected; see above.

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 LOQ and project specified objectives?

Yes☐ No☒ N/A☐ Comments:

Naphthalene, DRO and GRO were detected below the LOQ in sample *EB-MW01-15*, and RRO was detected above the LOQ in sample *EB-MW01-15.* This equipment blank is associated with samples *OME-MW01-15, OME-MW02-15* and *OME-MW03-15*.

Laboratory Report Date:

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

Sample *OME-MW01-15* contains DRO and RRO concentrations above the LOQ but less than 5 times the concentrations in *EB-MW01-15*. The analytes are considered not detected due to the EB contamination and flagged "UB" at their detected concentration. GRO was detected below the LOQ and less than 5 times the EB concentration. The GRO result is flagged "UB" at the LOQ.

Sample *OME-MW02-15* contains DRO and RRO concentrations below the LOQ and less than 5 times the EB result. These analytes are considered not detected and flagged "UB" at the LOQ.

Sample *OME-MW03-15* contains DRO below the LOQ and less than 5 times the EB result. DRO is considered not detected and flagged "UB" at the LOQ. RRO was detected above the LOQ and less than 5 times the EB concentration, and it was flagged "UB" at the corresponding result.

Naphthalene was not detected in the associated samples.

iii. Data quality or usability affected?

Comments:

The data quality/usability is affected; see above.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes☐ No☐ N/A☒ Comments:

No other data flags/qualifiers are required.

KRF

APPENDIX F: CONCEPTUAL SITE MODEL

Appendix F

Conceptual Site Model

CONTENTS

Print Form

Appendix A - Human Health Conceptual Site Model Scoping Form and Standardized Graphic

Site Name: ADOT&PF Nome Airport Sitewide PFAS

File Number: 400.38.056

Completed by: Shannon & Wilson, Inc.

Introduction

The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, summary text about the CSM and a graphic depicting exposure pathways should be submitted with the site characterization work plan and updated as needed in later reports.

General Instructions: Follow the italicized instructions in each section below.

1. General Information:

Sources *(check potential sources at the site)*

- ☐ USTs
- ☐ ASTs
- ☐ Dispensers/fuel loading racks
- ☐ Drums
- ☐ Vehicles
- ☐ Landfills
- ☐ Transformers
- ☒ Other: Aqueous Film Forming Foam (AFFF) release

Release Mechanisms *(check potential release mechanisms at the site)*

- ☒ Spills
- ☒ Leaks
- ☒ Direct discharge
- ☐ Burning
- ☐ Other:

Impacted Media *(check potentially-impacted media at the site)*

- ☒ Surface soil (0-2 feet bgs*)
- ☒ Subsurface soil (>2 feet bgs)
- ☐ Air
- ☒ Sediment
- ☒ Groundwater
- ☒ Surface water
- ☒ Biota
- ☐ Other:

Receptors *(check receptors that could be affected by contamination at the site)*

- ☐ Residents (adult or child)
- ☒ Commercial or industrial worker
- ☒ Construction worker
- ☐ Subsistence harvester (i.e. gathers wild foods)
- ☐ Subsistence consumer (i.e. eats wild foods)
- ☐ Site visitor
- ☒ Trespasser
- ☐ Recreational user
- ☐ Farmer
- ☐ Other:

* bgs - below ground surface

2. Exposure Pathways: *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact -

1. Incidental Soil Ingestion

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site-specific basis.) ☒

If the box is checked, label this pathway complete: Complete

Comments:

Surface soil samples contained PFOS, PFOA, and DRO above cleanup levels. PFOS and PFOA also exceeded soil cleanup levels in subsurface soil.

2. Dermal Absorption of Contaminants from Soil

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.) ☒

Can the soil contaminants permeate the skin (see Appendix B in the guidance document)? ☒

If both boxes are checked, label this pathway complete: Complete

Comments:

b) Ingestion -

1. Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater, or are contaminants expected to migrate to groundwater in the future? ☒

Could the potentially affected groundwater be used as a current or future drinking water source? Please note, only leave the box unchecked if DEC has determined the ground-water is not a currently or reasonably expected future source of drinking water according to 18 AAC 75.350. ☒

If both boxes are checked, label this pathway complete: Complete

Comments:

Shannon & Wilson's well search found two water supply wells, neither of which are used for drinking and cooking. Property owners near the OME report the water has high metals concentrations, including arsenic at levels exceeding drinking water standards. While possible, groundwater is unlikely to be a future drinking water source.

2. Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water, or are contaminants expected to migrate to surface water in the future? ☒

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities). ☐

If both boxes are checked, label this pathway complete: Incomplete

Comments:

Shannon & Wilson's well search found two water supply wells, neither of which are used for drinking and cooking. Property owners near the OME report the water has high metals concentrations, including arsenic at levels exceeding drinking water standards. While possible, groundwater is unlikely to be a future drinking water source in the site area.

3. Ingestion of Wild and Farmed Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild or farmed foods? ☐

Do the site contaminants have the potential to bioaccumulate (see Appendix C in the guidance document)? ☒

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. soil within the root zone for plants or burrowing depth for animals, in groundwater that could be connected to surface water, etc.) ☒

If all of the boxes are checked, label this pathway complete: Incomplete

Comments:

Surface soil samples exceeded PFOS, PFOA, and DRO cleanup levels only within the OME restricted area (i.e., behind the fence). Subsistence harvesters are not permitted in this area. Nome residents fish in the Snake River and Norton Sound, but surface water does not appear to be impacted.

c) Inhalation-

1. Inhalation of Outdoor Air

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.) ☒

Are the contaminants in soil volatile (see Appendix D in the guidance document)? ☐

If both boxes are checked, label this pathway complete: Incomplete

Comments:

PFAS are not included in Appendix D. BTEX were not detected in the surface soil samples.

2. Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be occupied or placed on the site in an area that could be affected by contaminant vapors? (within 30 horizontal or vertical feet of petroleum contaminated soil or groundwater; within 100 feet of non-petroleum contaminted soil or groundwater; or subject to "preferential pathways," which promote easy airflow like utility conduits or rock fractures) ☒

Are volatile compounds present in soil or groundwater (see Appendix D in the guidance document)? ☐

If both boxes are checked, label this pathway complete: Incomplete

Comments:

BTEX were detected in the groundwater sample collected near the ARNG building at concentrations less than the DEC groundwater cleanup levels. We consider this pathway insignificant.

3. **Additional Exposure Pathways:** *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

Dermal Exposure to Contaminants in Groundwater and Surface Water

Dermal exposure to contaminants in groundwater and surface water may be a complete pathway if:

- Climate permits recreational use of waters for swimming.
- Climate permits exposure to groundwater during activities, such as construction.
- Groundwater or surface water is used for household purposes, such as bathing or cleaning.

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are deemed protective of this pathway because dermal absorption is incorporated into the groundwater exposure equation for residential uses.

Check the box if further evaluation of this pathway is needed: ☒

Comments:

Nome residents and miners swim in the harbor and Norton Sound in summertime. However, PFOS and PFOA were not detected above groundwater cleanup levels in surface water samples from drainage ditches and creeks that flow into these water bodies.

Industrial workers, construction workers, or site visitors could be exposed to shallow contaminated groundwater during future excavation and construction projects. Identified water supply wells near the OME are used for industrial purposes only. While possible, groundwater is unlikely to be a future household water source.

Inhalation of Volatile Compounds in Tap Water

Inhalation of volatile compounds in tap water may be a complete pathway if:

- The contaminated water is used for indoor household purposes such as showering, laundering, and dish washing.
- The contaminants of concern are volatile (common volatile contaminants are listed in Appendix D in the guidance document.)

DEC groundwater cleanup levels in 18 AAC 75, Table C are protective of this pathway because the inhalation of vapors during normal household activities is incorporated into the groundwater exposure equation.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers (Particulate Matter - PM_{10}). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.

DEC human health soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because the inhalation of particulates is incorporated into the soil exposure equation.

Check the box if further evaluation of this pathway is needed: ☒

Comments:

Surface soil samples contained PFOS, PFOA, and DRO above cleanup levels. Soil at the OME is commonly silty sand or silty gravel fill, allowing for small respirable particles.

Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during some recreational, subsistence, or industrial activity. People then incidentally ingest sediment from normal hand-to-mouth activities. In addition, dermal absorption of contaminants may be of concern if the the contaminants are able to permeate the skin (see Appendix B in the guidance document). This type of exposure should be investigated if:

- Climate permits recreational activities around sediment.
- The community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

Generally, DEC direct contact soil cleanup levels in 18 AAC 75, Table B1, are assumed to be protective of direct contact with sediment.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

PFOS and PFOA were found below cleanup levels in sediment samples from around the OME.

4. Other Comments *(Provide other comments as necessary to support the information provided in this form.)*

HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: ADOT&PF Nome Airport Sitewide PFAS
400.38.056

Completed By: Shannon & Wilson, Inc.
Date Completed: January 2020

***Instructions*: Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.**

(1) *Check the media that could be directly affected by the release.*

(2) *For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.*

(3) *Check all exposure media identified in (2).*

(4) *Check all pathways that could be complete. The pathways identified in this column **must** agree with Sections 2 and 3 of the Human Health CSM Scoping Form.*

(5) *Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.*

Current & Future Receptors

Media	Transport Mechanisms	Exposure Media	Exposure Pathway/Route	Residents (adults or children)	Commercial or industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
☑ Surface Soil (0-2 ft bgs)	Direct release to surface soil — check soil	☑ soil	☑ Incidental Soil Ingestion		C/F	C/F	F			
	☑ Migration to subsurface — check soil		☑ Dermal Absorption of Contaminants from Soil		C/F	C/F	F			
	☑ Migration to groundwater — check groundwater		☑ Inhalation of Fugitive Dust		C/F	C/F	F			
	☐ Volatilization — check air	☑ groundwater	☑ Ingestion of Groundwater	I	I					
	☐ Runoff or erosion — check surface water		☑ Dermal Absorption of Contaminants in Groundwater	I	F	F	F			
	☑ Uptake by plants or animals — check biota		☐ Inhalation of Volatile Compounds in Tap Water							
	☐ Other (list):	☐ air	☐ Inhalation of Outdoor Air							
☑ Subsurface Soil (2-15 ft bgs)	Direct release to subsurface soil — check soil		☐ Inhalation of Indoor Air							
	☑ Migration to groundwater — check groundwater		☐ Inhalation of Fugitive Dust							
	☐ Volatilization — check air	☐ surface water	☐ Ingestion of Surface Water							
	☑ Uptake by plants or animals — check biota		☐ Dermal Absorption of Contaminants in Surface Water							
	☐ Other (list):		☐ Inhalation of Volatile Compounds in Tap Water							
☑ Ground-water	Direct release to groundwater — check groundwater	☑ sediment	☐ Direct Contact with Sediment							
	☐ Volatilization — check air	☑ biota	☐ Ingestion of Wild or Farmed Foods							
	☐ Flow to surface water body — check surface water									
	☐ Flow to sediment — check sediment									
	☑ Uptake by plants or animals — check biota									
	☐ Other (list):									
☐ Surface Water	Direct release to surface water — check surface water									
	☐ Volatilization — check air									
	☐ Sedimentation — check sediment									
	☐ Uptake by plants or animals — check biota									
	☐ Other (list):									
☐ Sediment	Direct release to sediment — check sediment									
	☐ Resuspension, runoff, or erosion — check surface water									
	☐ Uptake by plants or animals — check biota									
	☐ Other (list):									

IMPORTANT INFORMATION

Important Information

About Your Environmental Report

IMPORTANT INFORMATION

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors that were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent

IMPORTANT INFORMATION

such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary, because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

IMPORTANT INFORMATION

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, 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 the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland